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ACADEMIC ADVISING AT OREGON STATE UNIVERSITY

Academic Advising

OSU recognizes that quality academic advising is integral to the academic development and well-being of students. Quality academic advising includes both the prescriptive elements of advising (assisting with course selection, maintaining curriculum checklists, tracking degree progress and completing degree audits, etc.) and the developmental aspects of advising (major and career decision making, integration in campus and academic cultures, assistance with and referrals surrounding issues affecting a student’s academic success, etc.).

While each college has developed an advising system sensitive to the needs of its academic disciplines and departments, there is consistency in that each also has a head advisor. Undeclared students receive advising through the University Exploratory Studies Program (UESP).

Vision

Oregon State University aspires to be recognized nationally for excellence in academic advising among land grant institutions.

Mission

Oregon State University academic advising is a teaching and learning process dedicated to student success. Academic advising engages students in developing a plan to realize their educational, career, and life goals.

Values

The values associated with OSU advising are closely aligned with the stated values of the university.

Accountability: We are committed to providing timely, accurate, and intentional advising.

Diversity: We honor the unique nature and interests of each student. Advising services and delivery methods will be shaped to fit the diverse needs of our campus populations.

Respect: We seek to establish a reciprocal relationship with students based on an ethic of care and shared responsibility.

Social Responsibility: We foster a culture of independent thinking and global awareness so that students make informed, socially responsible choices consistent with their academic, career, and life goals.

Integrity: We seek to engage students in a fair and professional process of meaningful self-reflection and authentic inquiry.

Purpose of Academic Advising

Academic Advisors act as interpreters of the OSU learning environment and facilitators to the undergraduate degree experiences. In working toward degree completion, an advisor can help make sense of options, obligations, and opportunities related to student’s academic interests. An advisor can also help students start to think about how undergraduate learning relates to career opportunities. An advisor can help in the decision-making process, especially when the relationship is based on openness, honesty, and trust. Above all, an academic advisor is a person who is invested in helping students create rewarding learning experiences.

For the advising relationship to be effective, students and advisors both need to be engaged in the process. OSU advisors have created this list of Advisor-Advisee Responsibilities to outline the obligations of each:

As an advisee, you should:

- Understand and accept that you are ultimately responsible for your education and your own decisions.
- Initiate a purposeful relationship with your advisor and make appointments when requested and/or when necessary.
- Utilize the technological resources available to you (MyDegrees (https://login.oregonstate.edu/cas/login?service=https%3A%2F%2Fmyosu.oregonstate.edu%3A443%2Fportal%2FLogin/), OSU Online Catalog and Schedule of Classes (http://catalog.oregonstate.edu/), Baccalaureate Core website (http://oregonstate.edu/main/baccalaureate-core/), your college, school, or department website (http://oregonstate.edu/main/academics/) to inform yourself about your degree requirements and options.
- Prepare for and be active in your advising session, and ask questions when you have them.
- Work to clarify your personal values, abilities, and goals and share them with your advisor.
- Provide accurate and truthful information when being advised.
- Keep your local address and phone up to date in Online Services and utilize and check your ONID account daily for important information coming from your advisor and the institution.
- Learn and understand OSU’s policies, procedures, and requirements as they relate to your academic success and/or degree completion.
- Follow through on plans-of-action identified during advising sessions.
- Be aware of and abide by academic calendar deadlines (http://registrar.oregonstate.edu/osu-academic-calendar/).
- Call to cancel appointments that cannot be kept.

Your advisor should:

- Develop a purposeful relationship with and be an advocate for their advisees.
- Inform students of the nature of the advisor/advisee relationship.
- Assist students in defining and developing expressed educational, career, and life plans.
- Provide timely and accurate educational information.
- Promote learning opportunities that will help students define or meet personal goals and plans.
- Assist students in preparing a program that is consistent with their abilities and interests.
- Monitor progress toward educational/career goals.
- Interpret and provide rationale for institutional policies, procedures and requirements.
- Inform inquiring students of campus resources and special services available to them.
- Refer students to those resources that can enhance or supplement their academic or personal experience.

Head Advisors by College and Program

Agricultural Sciences

Michelle McAllaster
147 Strand Agriculture Hall
Phone: 541-737-5816
Email: casstuds@oregonstate.edu
**Business**
Carol Leder
122 Austin Hall
Phone: 541-737-3716
Email: StudentServices@bus.oregonstate.edu

**Earth, Ocean, and Atmospheric Sciences**
Mary Chuinard
104C Wilkinson Hall
Phone: 541-737-1201
Email: ceoas.undergrad@oregonstate.edu
Website: http://ceoas.oregonstate.edu/academics/advising/

**Education**
Jason Tena-Encarnacion
104G Furman Hall
Phone: 541-737-2998
Email: askcoed@oregonstate.edu

**Engineering**
Brett Jeter
114 Johnson Hall
Phone: 541-737-5236
Email: askengineering@oregonstate.edu

**Forestry**
Nicole Kent
404 Snell Hall
Phone: 541-737-1592
Email: ForestryStudentServices@oregonstate.edu

**Liberal Arts**
Tristen Shay
214 Bexell Hall
Phone: 541-737-0561
Email: liberalarts@oregonstate.edu

**Pharmacy**
Angela Austin Haney
209 Pharmacy Bldg.
Phone: 541-737-3424
Email: pharmacy@oregonstate.edu

**Public Health and Human Sciences**
Erin Heim
131 Women's Bldg.
Phone: 541-737-8900
Email: PHHS.Peer@oregonstate.edu (hhs@oregonstate.edu)

**Science**
Heather J. Arbuckle
109 Kidder Hall
Phone: 541-737-4786
Email: sciencesuccess@oregonstate.edu

**University Honors College**
450 Learning Innovation Center
Phone: 541-737-6414
Email: uhcadvisor@oregonstate.edu

1 Colleges and programs offering online degree programs
ACADEMIC REGULATIONS

Introduction

These regulations and procedures are published to assist students by providing information that is essential for planning and pursuing their academic programs. Continuing efforts are made each year by the students, faculty, and administration to revise and improve these regulations in order to enhance the quality of the university’s programs and the achievement of educational goals.

Every student is responsible for knowing the academic regulations and for observing the procedures that govern their relations with Oregon State University. Unless otherwise specified, these regulations apply to both undergraduate and graduate students. Any questions regarding these regulations that cannot be answered by a student’s academic advisor should be referred directly to the Office of the Registrar (B102 KAd).

Students encountering special problems whose proper solution may require deviations from the academic regulations or procedures should address their concerns to the Office of the Graduate Dean (Heckart Lodge). Petitions received by the registrar will be forwarded to the proper office. Requests for deviations from Graduate School policies should be addressed to the Office of the Graduate Dean (Heckart Lodge).

Some students encounter special problems whose proper solution may require deviations from the academic regulations or procedures. Requests for such deviations in the regulations below must be presented to the Office of the Registrar on petition forms, which are available in that office. Petitions received by the registrar will be forwarded to the proper office for review and appropriate action. Requests for deviations from Graduate School policies should be presented by letter to the Dean of Student Life (Student Conduct or from the OSU website under ‘Student Conduct’.)

Other special problems may involve academic issues such as academic freedom in the classroom or evaluations of a student’s academic performance. All students should appeal academic grievances first to the instructor of the course and then to the chair or head of the academic unit in which the course is offered. If the situation is not resolved to the student’s satisfaction, an undergraduate student should consult with the head advisor of the college in which the course is offered to obtain further information about appeal procedures of the college or university; a graduate student should consult the dean of the Graduate School regarding academic appeal procedures above the departmental level. (Appeal procedures for other than academic grievances, e.g., grievances regarding student employment, financial aid, housing, discipline, human rights, etc. are outlined in the Student Life Policy and Regulations, which are available on the OSU website under ‘Student Conduct’ or from the Dean of Student Life. Some of these regulations pertain to both undergraduate and graduate students. The Graduate School section of this catalog outlines both academic appeal procedures and those relating to the employment of graduate students.)

AR 1. Admission for Nondegree Students

a. Nondegree enrollment status for undergraduate students is designed for students who wish to take undergraduate classes, but do not wish to pursue a degree or a specific postbaccalaureate credential. Nondegree undergraduate students are limited to taking a maximum of 36 credits (or all credits if fewer than 36) per term. Nondegree Ecampus, International Exchange, credential and certificate students are not limited as to the number of courses (credits) taken per term.

b. A maximum of 36 credits attempted as a nondegree undergraduate student may be used to satisfy Baccalaureate degree requirements upon admission as a degree-seeking student. The most recent 36 credits (or all credits if fewer than 36) will be applied to the Baccalaureate requirements.

c. Nondegree enrollment status for graduate students is designed for students who wish to take graduate courses but do not wish to pursue an advanced degree. Nondegree graduate students are not limited as to the number of courses (credits) taken per term.

d. Credits earned while enrolled as a nondegree graduate student will not necessarily apply to a graduate program upon admission to degree-seeking status. The student should refer to the admission requirements in the Graduate School section of this catalog. Communication with the Graduate School and specific academic programs is advised.

e. Nondegree students seeking admission to a degree program may do so by filing an undergraduate, postbaccalaureate, or graduate application for admission.

AR 2. Credit from a Two-Year Institution (Undergraduate Students)

a. College Transfer Credits: Oregon State University accepts for credit toward a baccalaureate degree all college transfer work completed at an Oregon or other regionally accredited community college up to 124 lower-division quarter credits. For Institutional Requirements for Baccalaureate Degrees, see AR 25. Students are encouraged to work with the relevant academic unit to ensure that transfer credits meet department and college requirements for the degree. It would be unlikely for an individual student to be able to use all 124 credits toward an OSU baccalaureate degree. Transfer credits and grades are not used in calculating the OSU cumulative GPA. Students who hold OSU-approved direct transfer degrees from Oregon or other regionally accredited community colleges (e.g., the Associate of Arts Oregon Transfer) or who have 90 or more credits accepted in transfer will be granted junior standing. Students who hold OSU-approved direct transfer degrees will be considered to have met the Perspectives and Skills (except WIC) areas of the Baccalaureate Core.

b. Transfer of Professional-Technical Credits: a maximum of 12 quarter credits (8 semester credits) of professional-technical course work applicable in an associate’s degree or certificate program at a regionally accredited institution can be accepted upon admission to OSU as general elective credit (graded as Pass) and as part of the 124-quarter credit total that can be applied toward a baccalaureate degree.

c. Transfer of Professional-Technical Course Credits through Articulation Agreements: Lower-division OSU credit may be awarded for specific professional-technical community college courses when those courses are validated by articulation agreement with the appropriate OSU department. This may be above the 12 quarter credits of general electives (graded as Pass) allowed when a student is admitted to OSU. Credit will be awarded only upon the recommendation of the appropriate department and college, and approval by the Curriculum Council. Community college professional-technical course work is not equated to upper-division OSU course work. These course credits will count as part of the 124 quarter credits defined in paragraph 2a above. OSU departments who have articulation agreements with community colleges regarding
community college professional-technical courses shall review the agreements annually and forward a dated list of the articulated community college courses to the Curriculum Council.

1 Junior standing does not necessarily imply that OSU institutional, college, division, and/or departmental requirements, which are normally satisfied by OSU students prior to their junior year, have been satisfied.

AR 3. Credit from a Non-Regionally Accredited Institution (Undergraduate Students)

After three terms of work at Oregon State University satisfactory to the Undergraduate Admissions Committee, a student may request validation of work done in a non-regionally accredited institution of collegiate rank. The committee will consider each petition separately and base its decision on all information available. In some instances, informal examinations by the departments concerned may be required. Credit for transfer of professional-technical work will be awarded in accordance with paragraphs AR 2, b and c.

AR 4. Classifying Students

a. Undergraduate students: A student who has earned at least 45 credits is classified as a sophomore. A student who has earned at least 90 credits is classified as a junior. A student who has earned at least 135 credits is classified as a senior.

b. Postbaccalaureate students: A student holding a baccalaureate degree who is admitted to work toward a second baccalaureate degree or teaching certificate is classified as a postbaccalaureate student.

c. Graduate students: A student who has been admitted to the Graduate School is classified as a graduate student.

AR 5. Transfer from One College to Another (Undergraduate Students)

Registered students may transfer from one college to another at any time. Returning but not-registered students may transfer colleges between the dates of readmission and registration.

AR 6. Change in Credits Scheduled

No change may be made in the number of credits specified for the various courses and published in the OSU Academic Catalog.

AR 7. Maximum and Minimum Registration

1. The minimum number of credits for which a full-time undergraduate student may register is 12, and the maximum is 19, regardless of the method of grading used for the classes selected. (In determining the load for students not normally held responsible for physical education, the credits in activity courses in physical education will be disregarded.) The maximum may be extended:

a. Up to and including 24 credits when a student has completed in their most recent term at least 12 credits in courses other than those graded P/N and S/U with a grade-point average of 3.00 or better in their most recent term or when a student has filed with the Registrar a petition approved by their advisor and college dean (or head advisor).

b. Over 24 credits by petition approved by a student's advisor and college dean (or head advisor) and the Academic Requirements Committee and filed with the registrar.

2. The minimum number of credits for a full-time graduate student is 9; the maximum is 16. The maximum can be extended by approval of the dean of the Graduate School.

a. Degree-seeking graduate students must take a minimum of 3 credits for any term in which they are enrolled.

b. Appointees on graduate assistantships must register for a minimum of 12 graduate credits per term and are limited to a maximum of 16 credits per term.

AR 8. Late Registration

Registration is permitted through the second full week of classes each term. Late fees are assessed in accordance with the fee policies stated in the 'Tuition, Fees and Payment' (p. 1667) information in the Academic Catalog.

AR 9. Admission/Enrollment to Class

a. Students whose names appear on class rosters are officially registered; others must complete their registration for enrollment to class.

b. If it is anticipated that the demand for enrollment in a given course will exceed the maximum number that can be accommodated, the department offering the course may designate it in the Schedule of Classes with the code ‘NSHD’ (no-show-drop). A student who is registered for such a course who attends no meetings of the course during the first five school days of the term will be dropped from the course by the instructor, unless the student has obtained prior permission for absence. If such action is taken, the instructor will notify, through the department, the Office of the Registrar, which in turn will drop the student from their course. Students are responsible for confirming their course registration online. No tuition or fee will be charged for that course.

AR 10. Eligibility

To be eligible to hold office or to participate in any extracurricular activity supervised by Oregon State University, students must meet certain requirements.

1. For student activities, students are responsible for following the Student Life Policies (found in University Policies and Standards).

2. For participation in intercollegiate athletics, students must meet all institutional Pac-12 and NCAA requirements. Students should contact the Compliance Office in the Department of Intercollegiate Athletics on all such matters.

AR 11. Adding and Dropping Courses

1. Students may add courses through the second full week of classes each term, depending on the nature of the course and the availability of space. From the end of the first full week of classes to the end of the second full week of classes, permission (signature) of the instructor offering the course must be obtained.

2. A student may drop courses without responsibility for grades through the end of the first full week of classes. After the drop deadline courses may not be dropped. Failure to drop a course properly will result in an F grade being recorded; courses properly dropped do not appear on the student's transcript.
3. Add/drop fees are assessed in accordance with the fee policies stated in the Tuition, Fees and Payment (p. 1667) information in the Academic Catalog.

AR 12. Withdrawal from Individual Classes

Any student may withdraw from a maximum of 12 individual OSU credit-bearing classes throughout their undergraduate career at OSU. Any student may petition for an exception from this limitation if the justification for withdrawal is clearly associated with circumstances beyond the student’s control. Withdrawal from a class with a W grade begins after the drop deadline, which is the first full week of classes, and continues through the end of the seventh full week of classes. After the seventh full week of classes, students are expected to complete the program attempted and will receive letter grades (A, A–, B+, B, B–, C+, C, C–, D+, D, D–, F, S, U, P, or N) for all classes in which enrolled unless they officially withdraw from the term. Procedures for withdrawal from individual classes can be found on the Office of the Registrar website.

Withdrawal from the term, as defined in AR 13, is not included in the maximum of 12 individual OSU classes.

This regulation applies to undergraduate, postbaccalaureate, and nondegree undergraduate students.

The maximum withdrawal count will begin for all students starting fall 2012.

AR 13. Withdrawal from the Term

a. Any student is entitled to Withdraw from the Term up to four times without prejudice prior to the beginning of finals week. The student may accomplish this by completing the online withdrawal survey available through online services. Withdrawal from the term prior to the beginning of finals week will result in the grade of W being recorded for each course for which the student is registered.

b. When a student’s academic progress is interrupted by an emergency situation such as serious illness, accident, or death of a family member, and the emergency situation occurs within the last four weeks of the term, and the student submits evidence to the college head advisor, then the student will work with academic advisors, faculty members, student care teams or Ecampus student services, depending on the complexities of the circumstances to determine an appropriate course of action to determine the grades for the term.

c. Undergraduate Planned Educational Leave Program. The Undergraduate Planned Educational Leave Program (PELP) is a voluntary, temporary, planned interruption or pause in a student’s regular, full-time education. Its purpose is to enhance an undergraduate student’s prospect of successful completion of their academic program. The PELP provides one opportunity for a student to arrange a voluntary absence for as many as six consecutive regular academic terms (not including summer terms). The PELP is designed to allow a student to pursue other activities that will assist them in clarifying their educational goals, such as job opportunities and experiences away from campus, military deployment, time to resolve personal or medical problems, or other similar pursuits. The PELP allows an undergraduate student to temporarily suspend their academic work for a period of time (in accordance with AR 13a and 13b), and resume their studies with minimal procedural difficulties. The PELP $25 non-refundable application fee allows an undergraduate student to maintain their official standing as a student at OSU and reserves the student’s right to keep their original academic catalog active during their absence. Beginning with the 2011–2012 academic year, all OSU undergraduate students are eligible to request leave through the PELP. The university reserves the right to consider a student’s current academic standing and any existing student conduct issues prior to approving the voluntary PELP leave request. Students who withdraw from OSU prior to the 2011–2012 academic year and who are away from campus for four or more consecutive regular academic terms (not including summer terms) must re-enroll with OSU to re-establish their relationship as an OSU student and their academic catalog will be reset to the academic year they return to OSU.

Transcript Notation

A notation of the dates of any approved leave will be indicated on each student’s official transcript.

1. Military deployments are an exception to this limitation. All military personnel who are deployed for military service may submit a voluntary leave request for each deployment.

2. In accordance with the university’s catalog policy contained in the Academic Catalog.

3. The PELP began with the 2011–2012 academic year (Summer 2011). Any former OSU students who attended OSU prior to the 2011–2012 academic year and have been absent for four or more consecutive regular academic terms will be held to OSU’s prior policy that resets the academic catalog to the catalog in effect at the time they return to OSU.

AR 14. Attendance

Attendance is one of the most important factors in a student’s academic success. Therefore, an instructor may consider attendance as part of a course grade. If attendance is used in determining the student’s grade, how attendance shall be used needs to be defined in the course syllabus by the instructor.

AR 15. Academic Misconduct

Definitions and examples of academic misconduct are outlined in the Code of Student Conduct, Section 4.2.1. [https://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/edited_code_of_student_conduct.pdf]

The administration of the classroom rests with the instructor. When potential academic misconduct comes to the instructor’s attention, the instructor documents the incident and permits the student to provide an explanation. If the matter can be resolved without an academic sanction, no report is necessary. If the instructor believes academic misconduct has occurred and that the violation warrants the application of an academic sanction, the instructor: (a) consults with the unit head, (b) submits an Academic Misconduct Report (AMR) documenting the allegations and indicating the proposed sanction, and (c) informs the student of the action taken. The instructor may recommend any academic sanctions.

Allegations of academic misconduct are reviewed and adjudicated by a college-designated hearing officer (CHO) in accordance with the procedures outlined in the Code of Student Conduct, Section 5.11 [https://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/edited_code_of_student_conduct.pdf]. If the student is not a major in the college in which the course is offered, the CHO of the college in which the student is a major also receives a copy of the AMR.

Depending upon the severity of the violation, or if a record of previous academic misconduct exists, the college and/or university may impose
AR 16. Finals Week

1. No final, midterm, or comprehensive examinations shall be given during the week preceding final examination week. (Examinations on laboratory work, course material covered by ‘weekly’ or ‘section’ quizzes, television courses, ROTC activities, and physical education activities are allowed.)

2. Course work shall continue up to final week. Final examinations shall be given during finals week in accordance with the finals week schedule. If a final examination is not to be given in a course, this action must be approved by the department with notification to the Registrar’s Office. Requests for changes in the time of final examinations will be submitted to the Registrar’s Office.

3. All student petitions for changes in the time of final examinations must be made using forms available from the Registrar’s Office. (A summary of university final examination policy is printed on the form.) Petitions for changing final examinations are submitted directly to the instructor. Students may forward disapproved petitions through the dean of the college to the Registrar’s Office. Requests to change the assigned final examination time for an entire class must be approved by the Registrar’s Office. Final examinations may not be changed to the week preceding final week without approval of the Academic Requirements Committee.

4. No extracurricular activities or curricular activities other than examinations and final class meetings shall be scheduled during final week.

AR 17. Grades

The grading system consists of twelve basic grades, A, A–, B+, B, B–, C+, C, C–, D+, D, D–, and F. The grade of A denotes exceptional accomplishment; B, superior; C, average; D, inferior; F, failure. Other marks are I, incomplete; W, withdrawal; R, thesis in progress; P, pass; N, no-credit; S, satisfactory; U, unsatisfactory; AUD, audited course; WAU, withdrawal from audited course; NG, no basis for a grade (administratively assigned by the Office of the Registrar, see below); WC, complete withdrawal.

When a requirement of a course has not been completed for reasons acceptable to the instructor and the rest of the academic work is passing, a report of I (incomplete) may be made and additional time granted. The I grade is only granted at the discretion of the instructor. The instructor must submit the grade the student will earn if the missing work is not completed; this is the alternate grade. The alternate grade will become the default grade if the missing work is not completed as part of the contract for completion of the grade. The instructor documents the deficiency and the deadline for completing the missing work. A record of the deficiency shall be kept on file in the unit or department office. The allotted time awarded shall not exceed one calendar year except by petition or the time of the degree conferral, whichever comes first. To remove the I grade, the student must complete the deficiency within the allotted time and the instructor will then submit the appropriate grade. If the student fails to complete the work within the allotted time, the Registrar’s Office will automatically change the I grade on the student’s record to the alternate grade submitted by the instructor at the time the I was given. The alternate grade will be included in the grade point average. Under no circumstances shall a student who earns an A–F grade or an N or U grade have their grade changed retroactively to an I grade.

An instructor may move to correct a grade by filing a Change of Grade in the Registrar’s Office. Grade changes for students of a permanently separated instructor will be managed by the department chair of the course involved. Upon permanent separation from the university an instructor’s change of grade will not be accepted by the Office of the Registrar. The Office of the Registrar will routinely review grade changes.

1 A student may petition via the Office of the Registrar for an extension of the one calendar year deadline with the concurrence of the faculty. An approved petition will grant an extension of a single additional term, with a maximum of three total extensions being possible. An approved petition for an extension of time to remove an incomplete will be voided at the time of degree conferral.

AR 18. Alternative Grading Systems

In addition to traditional letter grading (A–F), Oregon State University has adopted two alternative grading systems to be employed in accordance with the provisions outlined below:

a. Satisfactory/Unsatisfactory (S/U)

1. Undergraduate students may elect to be graded on a Satisfactory/Unsatisfactory (S/U) basis in a course (except P/N courses) under the following conditions:
   a. A maximum of 36 credits of those presented in satisfaction of the baccalaureate degree may have been graded on an S/U basis at Oregon State University.
   b. A student normally elects the option S/U at the time of registration. Changes either to or from S/U grading will be permitted through the end of the seventh full week of any term.
   c. A student must obtain the approval of their academic advisor or dean in order to elect to be graded on an S/U basis.

2. Graduate students may elect to take undergraduate courses on the S/U basis except those courses required for the removal of deficiencies. Graduate courses may also be taken on an S/ U basis. (Such courses cannot be used as part of a student’s graduate program. All other provisions of S/U grading apply to graduate students.)

3. A grade of S (satisfactory) shall be equivalent to grades A, A–, B+, B–, C+, C, and C–. A grade of U (unsatisfactory) shall be equivalent to grades D+, D, D–, or F.

4. Grades of S or U shall have no grade-point equivalents; hence such grades shall not be included in the computation of grade-point averages. The credit of courses in which an S grade is obtained shall be counted toward graduation. Credits shall not be awarded for U grades.

5. Election of S/U grading for a course shall be known only to the student and the academic advisor. Instructors shall enter the traditional letter grade (A–F) earned. Automatic conversion to S grades and U grades will be made in the Office of the Registrar. A grade of I, Incomplete, may be assigned wherever appropriate.

6. In compliance with Section III of the Statement on Student Rights, Freedoms, and Responsibilities (dated April 28, 1969), disclosure or nondisclosure of the traditional letter grades received in courses in which S grades were awarded is recognized as an exclusive right of the individual student. The Registrar’s
Office is obliged and authorized to honor requests for disclosure, provided that the express consent of the student is obtained.

b. Pass/No Credit (P/N)
1. Those courses in which traditional letter grading has been deemed inappropriate because of the nature of the course content or the objectives of the course are graded on a Pass/No Credit (P/N) basis.
2. Grades of P or N shall have no grade-point equivalents; hence such grades shall not be included in the computation of grade-point averages. The credits of courses in which a grade of P is obtained shall be counted toward graduation. Credit shall not be awarded for N grades.
3. Departments are authorized to designate Pass/No Credit courses, subject to the following guidelines and procedures:
   a. The principal criterion for choice of grading system is enhancement of the educational experience for the student;
   b. The nature, structure, and/or objectives of a course may suggest that the Pass/No Credit grading system be adopted. It is anticipated that courses graded on this basis will generally fall into one of the following categories: skill-building courses or practicums, courses which stress orientation and awareness rather than academic preparation;
   c. The designation of Pass/No Credit grading for a course will follow the academic college's recommendation and approval by the University Curriculum Council, and in the case of graduate courses, by the Graduate Council. Designation of courses for P/N grading must be completed prior to the opening of registration for the term in which the course is offered.
4. Courses approved for grading on a Pass/No Credit (P/N) basis are identified in the Schedule of Classes.
   c. Nothing stated in the above paragraphs shall be construed as constituting support for petitions requesting change of grade in courses taken during or prior to spring term, 1971.

AR 19. Grade Points
Grade points are computed on the basis of:

- 4 points for each credit of A grade,
- 3.7 for each credit of A– grade,
- 3.3 for each credit of B+ grade,
- 3.0 for each credit of B grade,
- 2.7 for each credit of B– grade,
- 2.3 for each credit of C+ grade,
- 2.0 for each credit of C grade,
- 1.7 for each credit of C– grade,
- 1.3 for each credit of D+ grade,
- 1.0 for each credit of D grade,
- 0.7 for each credit of D– grade, and
- 0 for each credit of F.

Marks of I, W, P N, NG, R, S, U, AUD, WAU, and WC are disregarded in the computation of points. The grade-point average (GPA) is the quotient of total points divided by total credits; total credits are the number of term credits in which grades A, B, C, D, and F are received. Thus a person receiving 1 credit of A, 2 credits of B, 3 credits of C, 4 credits of D, 5 credits of F would have 20 grade points (1 x 4 plus 2 x 3 plus 3 x 2 plus 4 x 1 plus 5 x 0). The grade-point average would be 20 (grade points) divided by 15 (credits) equals 1.33. A C average on 15 credits attempted would require 30 grade points; if the student has 20 points, they are 10 grade points deficient.

AR 20. Repeated Courses
If a student repeats an Oregon State University course, the grade from each attempt1 will appear on the student's academic record but only the second attempt will count toward the student’s institutional credits, requirements, and grade-point average2. An academic unit3 may, however, include subsequent attempts after the second attempt to meet individual course degree requirements associated with the baccalaureate core/ majors/options/minors/certificates/endorsements. A course may not be repeated on an S/U basis if it was taken previously on a normal grade basis4.

1 An attempt comprises a final grade in a course where the grade is: A, A–, B+, B, B–, C+, C, C–, D+, D, D–, F, S, U, P, NP or an I/Alternate Grade (where the Alternate Grade is one of these grades).
2 Recognized repeatable courses as defined in the Oregon State University Academic Catalog, such as activity courses, research, seminars, and selected topics, do not come under this restriction. Additionally, if a course has been approved as a multiple repeatable course for credit and grade points, each attempt will be included in the institutional credits and grade-point average until it reaches its defined limit (total allowable attempts or credit maximums for the course). Further, the Office of the Registrar will include all courses from the first repeat taken until it reaches the maximum total allowable attempts or credit maximums for the course. All subsequent repeats after the repeat maximum has been reached will be excluded from both institutional credits earned and grade-point average calculations.
3 Academic Unit: College, School, or Department
4 Normal Grade Basis is defined as any grade of A, A–, B+, B, B–, C+, C, C–, D+, D, D–, F, or any I/Alternate Grade (where the Alternate Grade is one of these grades).

AR 21. Honor Roll
At the close of each term, the OSU Registrar publishes a list containing the names of all undergraduate and postbaccalaureate students who for the term have completed at least 12 graded credits with a grade-point average of 3.50 or above.

AR 22. Satisfactory Academic Standing (for Undergraduate and Post-Baccalaureate Students)
Oregon State University expects students to maintain satisfactory academic progress toward degree completion. At the conclusion of each term, grade-point averages are calculated and academic standings determined for students seeking a baccalaureate degree according to the criteria outlined below. Students whose standings evidence a lack of satisfactory progress will be warned of this condition and advised to seek help from their academic advisors. Any student who is not on Academic Warning, Academic Probation, or Academic Suspension is in good standing.

1. Academic Warning: Students with a term GPA below 2.0 will be placed on Academic Warning.
2. Academic Probation: Students who have attempted1 24 or more credits at OSU and have an OSU cumulative GPA below 2.0 will be
placed on Academic Probation. Students who attain a cumulative GPA of 2.0 or better are removed from Academic Probation.

3. **Academic Suspension:** Students who are on Academic Probation and have a subsequent term GPA below 2.0 will be placed on Academic Suspension. Academic Suspension is recorded on the student’s academic record. Students who are academically suspended are denied all the privileges of the institution and of all organizations in any way connected to it, including any university-recognized living group.

4. **Reinstatement to the University:** Suspended students will be considered for reinstatement to the university after two years or completion of a minimum of 24 quarter credits of transferable college-level work at a regionally accredited college or university, with a GPA of 2.5 or above.

The Faculty Senate Academic Standing Committee (http://senate.oregonstate.edu/academic-standing-committee/) is responsible for enforcement of the above regulations on Satisfactory Academic Standing. Additionally, this committee has discretionary authority to grant exceptions and to develop guidelines for administering these regulations.

1. **An attempt comprises a final grade in a course where the grade is:** A, A–, B+, B, B–, C+, C, C–, D+, D, D–, F, S, U, P, NP, I/Alternate Grade (where the Alternate Grade is one of these grades), W.

### AR 23. Special Examination for Credit

A regularly enrolled student in good standing, either graduate or undergraduate, currently registered at Oregon State University and wishing credit for an OSU course for which a grade has not been previously received, may petition for credit examination under the following conditions:

1. The application for such examination shall be presented on an Official Student Petition and shall bear the approvals of the dean of the student’s college, the dean of the college in which the course is offered, and head of the department in which the course is offered. Petitions for special examination for credit may be approved or denied at the sole discretion of the department/college offering the course, taking into account both the academic merit of the petition and the department/college’s ability to deploy adequate resources to prepare, administer, and grade such an examination.

2. In no case may such examination be based on work used for graduation from high school, or in a foreign language that is the mother tongue of the applicant, or in courses not listed in the Oregon State University Academic Catalog.

3. Grades earned in special examinations shall be submitted and recorded in the same way as for regularly registered courses, and will count with respect to repeating a course as defined in AR 20.

4. A student may not petition for credit by special examination for a course in any term in which the student is or has been enrolled in the course after the add/drop deadline for that term.

5. An examination for credit will not be approved for courses below the level for which college credit has previously been granted.

6. No examination may be taken until the applicant has received a permit from the Registrar’s Office, for which a fee of $80 will be charged.  

### AR 24. Special Examination for Waiver (Undergraduate Students)

A student may petition for examination to waive a course under the following conditions:

1. The application for examination to waive a course shall be presented on an Official Student Petition and shall bear the recommendations of the dean of the student’s college, the dean of the college in which the course is offered, and head of the department in which the course is offered. Petitions for special examination for waiver may be approved or denied at its sole discretion by the department/college offering the course, taking into account both the academic merit of the petition and the department/college's ability to deploy adequate resources to prepare, administer, and grade such an examination.

2. No examination may be taken until the applicant has received a permit from the Registrar’s Office, for which a fee of $80 will be charged.

3. A minimum grade of C (or equivalent) must be attained in an examination for that waiver to be granted.

4. Credit will not be granted for courses waived.

5. This regulation does not invalidate the right of a dean of a college or head of a department to waive a course requirement of their particular college or department, respectively.

### AR 25. Institutional Requirements for Baccalaureate Degrees (Undergraduate Students)

1. **Baccalaureate Core:** Each student will complete the following requirements:

   a. **Skills Courses (15 credits)**
      - Mathematics, Writing I, and Speech must be taken and completed satisfactorily within the first 45 hours of OSU-generated credits.
      - Writing II must be taken and completed satisfactorily within the first 90 hours of OSU-generated credits.
      - Fitness (3 credits)
      - Mathematics (3 credits)
      - Speech (3 credits)
      - Writing I (3 credits)
      - Writing II (3 credits)

   b. **Perspectives Courses (24 credits)**
      - Physical science (with lab) (4 credits)
      - Biological science (with lab) (4 credits)
Plus choice of second course in either of the above (with lab) (4 credits)
Take a minimum of one course in each of the following areas:
Western culture (3 credits)
Cultural diversity (3 credits)
Literature and the arts (3 credits)
Social processes and institutions (3 credits)
3. Difference, Power, and Discrimination Courses (3 credits)
4. Synthesis Courses (6 credits)
Science, technology, and society (3 credits)
Contemporary global issues (3 credits)
5. Writing Intensive Courses, upper division (WIC) (3 credits)
The Baccalaureate Core Committee determines which courses will satisfy each of the requirements above. WIC courses will be reviewed by the Writing Advisory Board. The core is governed by the following rules: (1) No more than two courses from any one department may be used by a student to satisfy the Perspectives category of the core. (2) No single course may be used by a student to satisfy more than one subject area of the core even though some courses have been approved in more than one area. (3) Both Synthesis courses may not be taken in the same department.¹
b. An undergraduate student may be granted a baccalaureate degree with one or more majors.
c. Credits: Minimum 180 earned credits, which must include²,³
1. Credits in upper-division courses: minimum 60 (exclusive of upper-division physical education activity courses).
2. Credits in each major: minimum 36, including at least 24 in upper-division courses.
d. Baccalaureate Degrees: All students receiving a BA degree shall have proficiency in a second language, which may include American Sign Language (ASL), equivalent to that attained at the end of the second year sequence with a grade of C– or better as certified by the School of Language, Culture, and Society. Colleges offering both the BA and the BS will have specific requirements distinguishing the two degrees. The college requirements for the two degrees will place comparable demands upon the time and effort of students, and that assessment of comparability will include the foreign language requirement for the BA. Academic units offering both the BA and BS may have specific requirements distinguishing the two degrees.
e. Grade-Point Average: minimum of 2.00 on OSU cumulative grade-point average.
f. Academic Residence:
1. A minimum of 45 of the last 75 credits, or 150 total credits, must be completed while the student is in academic residence at OSU. 'Academic Residence' is defined as OSU courses taken as a degree-seeking student of OSU or courses through one of the following approved special programs: Professional degree programs which require that the student enroll in another institution while finishing the bachelor's degree at OSU or an international study program sponsored by Oregon State University.
2. A minimum of 15 upper-division credits used to meet the preceding residency requirement (1) must be taken in each of the student's majors.
3. Credits earned by special examination for credit (AR 23) are not considered in academic residence.
g. Dean's certification of fulfillment of all requirements of major college.
(For details, see college advisors and deans.)
h. Restrictions: A maximum number of credits may be applied to the Baccalaureate Degree as follows:
1. Transfer from first professional programs such as Law, Medicine, Pharmacy, and Veterinary Medicine: maximum 48 quarter credits.
2. Music courses (applied music): maximum 12 credits. (This restriction is not applicable to majors in music.)
3. Physical activity courses: maximum 11 credits.
4. Courses graded on an S/U basis at Oregon State University: maximum 36 credits.
5. Academic Learning Service courses: maximum 15 credits.

i. Degree Candidacy: To become a candidate for a degree, a student must be identified by their College or the Office of the Registrar as a student in the process of completing their final graduation requirements. Upon successful completion of all degree requirements, a student’s degree(s) will be conferred by the University. Students will be notified of their advancement to graduation candidacy by the Office of the Registrar during their final term and will be able to make adjustments to their program of study, as needed, prior to degree conferral.

¹ Lists of approved courses may be obtained from advisors. Approved courses are also listed in the OSU Academic Catalog.
² Some degree programs may require more than 180 credits.
³ Unearned credits are those courses for which a grade of F, N, U, I, W, AUD, or WAU are assigned as a final grade for that course. All other grades are calculated as earned credit.

Faculty Senate revised AR 25f effective academic year 2013–2014.

AR 26. Concurrent and Subsequent Baccalaureate Degrees

a. Concurrent Baccalaureate Degrees: An undergraduate student may be granted two or more baccalaureate degrees (for example the BA or BS) at the same graduation exercise. The student must:
1. Complete institutional, college, and departmental requirements for the degree;
2. Complete, for each additional degree, a minimum of 32 credits more than the requirements of the curriculum requiring the least number of credits; and
3. Complete each additional 32 credits in residence.
b. Subsequent Baccalaureate Degree: A student who has received a previous baccalaureate degree from either OSU or another accredited university may be granted a subsequent baccalaureate degree. The student must:
1. Complete, for a BA degree, the requirements for foreign language proficiency (AR 25d);
2. Achieve a minimum of 2.00 on OSU cumulative grade-point average;
3. Complete requirements of the major college and receive the dean's certification; and
4. Meet the requirements for a concurrent degree as specified in AR 26a, if a previous baccalaureate degree has been received from OSU. The additional credits may be taken at any time prior to or subsequent to the granting of a previous OSU baccalaureate degree. Students with a baccalaureate degree from another institution must meet the Academic Residence requirement in AR 25f.
c. A student seeking a baccalaureate degree under the provisions of either AR 26a or AR 26b also must satisfy the appropriate residence requirements as defined in AR 25f.

**AR 27. Subsequent Credentials: Minors, Certificates, Options, and Majors**

1. **Subsequent Minors and Certificates:** A student who has received a previous baccalaureate degree from either OSU or another regionally accredited university or college may be granted a subsequent minor or certificate. The student must:
   1. Complete current requirements for minor or certificate; a minimum of 15 credits in the minor or certificate must be taken in residence and not applied to a previous baccalaureate degree;
   2. Achieve a minimum of 2.0 OSU cumulative grade-point average and a minimum of 2.0 for credits applying toward the minor or certificate;
   3. Receive the dean’s approval.

2. **Subsequent Options and Majors:** A student who has received a previous baccalaureate degree from OSU may be granted a subsequent option or major credential. The student must:
   1. Complete current requirements for option or major; a minimum of 20 upper division credits in the option or major must be taken in residence and not applied to a previous baccalaureate degree;
   2. Achieve a minimum of 2.0 OSU cumulative grade-point average and a minimum of 2.0 for credits applying toward the option or major;
   3. Receive the dean’s approval.

**AR 28. Substitutions**

a. **Undergraduate students:** Substitutions for institutional requirements as outlined in AR 25, except for baccalaureate core requirements of AR 25a, may be petitioned to the Academic Requirements Committee after approval by the student’s dean or college head advisor. Substitutions for baccalaureate core requirements of AR 25a may be presented for consideration to the student’s dean or college head advisor. Substitutions or adjustments of college or departmental requirements are also subject to approval by the college or department.

b. **Graduate students:** Substitutions for institutional requirements or deviations from the normal Graduate School regulations and policies may be made only by obtaining the approval of the dean of the Graduate School following a petition by means of a letter signed by the student and the student’s major professor. Action taken on such substitutions or petitions will not be considered as a precedent for any future action.

**AR 29. Graduation Exercises**

Attendance at graduation exercises is optional for graduating students. In accordance with procedures obtained from the Registrar’s Office, the candidate is responsible for declaring whether or not they will attend commencement, regardless of the term in which requirements are completed.

**AR 30. Auditing Courses**

Audit registration permits a student to enroll in a course for no credit and no grade. Course requirements for an audited course will be determined by the course instructor. Audit registration is available to degree and non-degree students. Audit registration is only allowable during the second full week of the term. Those who wish to audit should contact the Office of the Registrar for registration procedures, which will require approval of the course instructor. Audit courses are assessed instructional fees at the same rate as for credit courses. Any changes to an audit registration are subject to the same procedures, deadlines, and special fees as for registration changes to regular courses. Upon completion of an audited course, the designation of AUD will be recorded on the transcript. The designation of WAU will be recorded on the transcript for students who withdraw from an audit course.

**AR 31. Academic Fresh Start Policy**

An Oregon State University undergraduate student may petition once with the registrar to exclude OSU courses from the calculation of institutional requirements, credits, and grade-point average, under a condition of academic fresh start defined below.

**Conditions to qualify:**

The student must have an absence from OSU that begins after the end of the student’s last term of attendance and exceeds five academic years before re-admittance to a degree program at OSU. Prior to applying for academic fresh start student must, after re-enrolling in the university, have successfully completed a minimum of 24 letter-graded units over two consecutive terms, and earned a grade-point average of at least 2.5 in these terms. The student must also provide a signed letter of recommendation from a current OSU college dean, school director, or department or program chair/head. It may be seconded by the college head advisor or a current faculty member within the discipline the student is currently engaged to complete advocating on the student’s behalf for academic fresh start.

**Effect of the academic fresh start:**

- Upon meeting all of the conditions of qualification, the student may select from one to three contiguous academic terms from previous enrollment at OSU for the application of academic fresh start.
- The grades from all courses taken during the terms that are proposed for academic fresh start will be excluded from meeting institutional requirements and the calculation of institutional units and grade-point average.
- All grades representing the student’s academic history at OSU will appear on the student’s academic record (transcript), but all academic fresh start approved courses will be coded as ‘excluded’ similar to a repeated course. Additionally, a comment of ‘Academic Fresh Start’ will be appended to each term that qualifies under academic fresh start.
- All courses excluded under academic fresh start, will also be excluded from the calculation of course repeats defined by AR 20.

1. **Valid grades include outstanding I (Incomplete) grades that have not been resolved.**
ADMINISTRATION & ACCREDITATION

Oregon State University provides diverse educational opportunities through the undergraduate and graduate programs of its 13 colleges. Academic choices include studies in scientific, technological, interdisciplinary and professional as well as liberal arts fields. A land grant, sea grant, space grant and sun grant university with beginnings in the 1850s, OSU is now home to more than 30,000 undergraduate, graduate and first professional students, representing more than 100 countries, every state in the nation and every county in Oregon.

In addition to its regular educational programs, the university is responsible for Oregon’s land grant mission of research, education and outreach. The OSU Extension Service delivers educational programs in all of Oregon’s 36 counties, reaching out to communities with programs as diverse as Master Gardeners, 4-H, and community leadership. Working in collaboration with Extension Service faculty, the researchers in Oregon’s Agricultural Experiment Station conduct scientific, social and economic research at 11 branch stations at 15 locations across the state, including one of the nation’s only urban experiment stations, the Food Innovation Center in Portland.

Oregon State University Ecampus (http://ecampus.oregonstate.edu) provides learners with access to an OSU education no matter where they live. Ecampus offers accredited courses and degree programs online, with hybrid and continuing education classes offered at various sites throughout the state. There are currently more than 20 undergraduate degree programs, more than 20 undergraduate minors and nearly 30 graduate programs available online.

In addition to these extended campus opportunities, OSU has established a dual-enrollment Degree Partnership Program (http://oregonstate.edu/partnerships/) (DPP) with all 17 Oregon community colleges and several others in Hawaii. The DPP allows students to take classes at both institutions simultaneously. Students complete just one application, pay one application fee and have the freedom to select courses from either institution's schedule of classes.

OSU’s educational partners include all Oregon community colleges, Eastern Oregon University, the Oregon Center for Advanced Technology Education, Oregon Health & Science University, Portland State University, Southern Oregon University, University of Idaho, University of Oregon and Washington State University.

OSU-Cascades (http://osucascades.edu) in Bend, Oregon — the first branch campus in the state — began offering undergraduate and graduate degree programs in 2001 in partnership with Central Oregon Community College. Students earn an Oregon State University degree in their choice of 18 undergraduate majors, 12 minors and three graduate programs. In 2015, OSU-Cascades will become a full four-year branch campus and will begin enrolling freshmen and sophomores.

The president is the chief executive officer of the university and is appointed by the Oregon State Board of Trustees. Subject to the Board, the president is responsible for the overall leadership and direction of the university. The provost and executive vice president is the chief academic and operating officer and is responsible for the daily operations of the university.

In November 2009, four new divisions were created as part of OSU’s Strategic Alignment and Budget Reduction Implementation Plan: the Division of Arts and Sciences, Division of Business and Engineering, Division of Earth Systems Science, and the Division of Health Sciences.

The academic programs of Oregon State University are divided among 11 colleges, the Graduate School, and the University Honors College, each with a dean responsible for all faculty, staff, students, and academic programs.

The 11 colleges are the College of Agricultural Sciences; College of Business; College of Earth, Ocean, and Atmospheric Sciences; College of Education; College of Engineering; College of Forestry; College of Public Health and Human Sciences; College of Liberal Arts; College of Pharmacy; College of Science; and the College of Veterinary Medicine.

Colleges are divided into departments or schools administered by a department head, chair, or director. Each department may offer several programs of study leading to degrees, certificates, options, or minors requiring a specific group of courses for completion.

Leadership

Edward J. Ray, President

Dr. Edward J. Ray became Oregon State University’s 14th president in 2003. Since that time, he has led a remarkable transformation. Under President Ray’s leadership, Oregon State has become an internationally recognized public research university and has continued to expand the excellence, scope and impact of its academic, research and outreach services.

More information about the Office of the President and the units and leaders reporting to the president can be found on the Leadership (https://leadership.oregonstate.edu/president/) webpage.

Edward Feser, Provost and Executive Vice President

As Provost and Executive Vice President, Edward Feser is the chief academic and operating officer of Oregon State University, charged by President Ed Ray to oversee progress on the University's strategic goals in student success, faculty excellence, outreach and engagement, internationalization and institutional reputation.

More information about the Office of the Provost and the units and leaders reporting to the provost can be found on the Leadership (https://leadership.oregonstate.edu/provost/) webpage.

OSU Board of Trustees

The Board of Trustees of Oregon State University governs Oregon’s only university with a statewide presence and helps guide OSU’s mission to serve the state and the needs of its citizens in a growing global economy.

The board harnesses the talent and energy of education, civic and business leaders to help guide OSU’s future as a leader and innovator in excellence in teaching, discovery and service as an internationally recognized public research university. The first 14 members of the board were confirmed by the Oregon Senate in November 2013. OSU President Ed Ray is also a trustee (ex officio and non-voting), for a total of 15 members.

Further information and a complete list of Trustees can be found on the Leadership (http://leadership.oregonstate.edu/trustees/) webpage.

Equal Opportunity
Oregon State University, in compliance with state and federal laws and regulations, does not discriminate on the basis of age, color, disability, gender identity or expression, genetic information, marital status, national origin, race, religion, sex, sexual orientation, or veteran status in any of its policies, procedures, or practices. This nondiscrimination policy covers admission and access to, and treatment and employment in, university programs and activities, including but not limited to academic admissions, financial aid, educational services, and employment. Inquiries regarding the university’s equal opportunity policies may be directed to the Office of Equal Opportunity and Access (http://eoa.oregonstate.edu/) on 541-737-3556.

Oregon State University is accredited by the Northwest Commission on Colleges and Universities (NWCCU). The university is authorized to offer baccalaureate, master’s, doctorate, and first professional degrees, as well as undergraduate-, postbaccalaureate-, and graduate-level certificates. The NWCCU reaffirmed the accreditation of Oregon State University in 2011. The last comprehensive NWCCU evaluation site visit was April 15 - 17, 2019.

In the College of Agricultural Sciences, the Rangeland Sciences program is accredited by the Society for Range Management (SRM). The Department of Food Science and Technology’s undergraduate curricula are approved by the Higher Education Review Board (HERB) of the Institute of Food Technologists (IFT). The Agricultural Education major is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the Oregon Teacher Standards and Practices Commission (TSPC).

In the College of Business, the Business Administration programs (undergraduate and graduate) are accredited by the Association to Advance Collegiate Schools of Business (AACSB—International).

The College of Education programs are accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the Oregon Teacher Standards and Practices Commission (TSPC) for the preparation of elementary and secondary teachers. The graduate programs in Counseling are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).

In the College of Engineering, the Bachelor of Science degrees in Bioengineering, Chemical, Civil, Ecological, Electrical and Computer, Energy Systems, Environmental, Industrial, Manufacturing, Mechanical, and Nuclear Engineering baccalaureate programs are accredited by the Engineering Accreditation Commission of ABET, Inc. The new Bachelor of Science degree in Architectural engineering will submit an application for preliminary review by ABET in September 2019. The Construction Engineering Management program is accredited by the American Council for Construction Education (ACCE). The Bachelor of Science degree in Computer Science-Computer Systems Option is accredited by the Computing Accreditation Commission of ABET, Inc. The Bachelor of Science degree in Radiation Health Physics is accredited by the Applied Science Accreditation Commission of ABET, Inc.

In the College of Forestry, BS degrees in Forestry, Forest Engineering, and Forest Engineering-Civil Engineering are accredited by the Society of American Foresters (SAF). In addition, the BS degree in Forest Engineering and the BS double degree in Forest Engineering-Civil Engineering are accredited by the Engineering Commission of ABET. The BS degree in Renewable Materials is accredited by the Society of Wood Science and Technology (SWST).

In the College of Liberal Arts, the Music Education Master of Arts in Teaching (MAT) degree program in the School of Arts and Communication is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and by the Oregon Teacher Standards and Practices Commission (TSPC); in the School of Public Policy the Master of Public Policy (MPP) is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA).

The College of Pharmacy’s PharmD program is accredited by the Accreditation Council for Pharmacy Education (ACPE). The College also offers PGY1 and PGY2 community pharmacy residency programs. The PGY1 program is jointly accredited by the American Society of Health-System Pharmacists (ASHP) and the American Pharmacists Association (APhA). The PGY2 programs are accredited by the American Society of Health-System Pharmacists (ASHP).

The College of Public Health and Human Sciences is accredited by the Council on Education for Public Health (CEPH). The Athletic Training major is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). The Dietetic option in the Nutrition major is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics, as is the transcript-visible post-baccalaureate Dietetic Internship. The graduate Physical Education Teacher Education licensure program is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the Oregon Teacher Standards and Practices Commission (TSPC). The Health Management and Policy undergraduate program is certified by the Association of University Programs in Health Administration (AUPHA). In Human Development and Family Sciences, the OSU Child Development Center in Bates Hall is accredited with the National Association for the Education of Young Children (NAEYC). HDFS participates in a double degree program in Early Childhood/Elementary Education that is accredited through the College of Education. The Double Degree pathway includes all the course work and field experiences necessary to qualify for an Oregon Initial Teaching License granted by the Teacher Standards and Practices Commission (TSPC).

In the College of Science, the Bachelor of Science in Chemistry Track One is approved by the American Chemical Society (ACS) and has two options: advanced biochemistry and advanced chemistry. Also, the Bachelor of Science in Biochemistry and Biophysics, and the Bachelor of Science in Biochemistry and Molecular Biology are both accredited by the American Society for Biochemistry and Molecular Biology (ASBMB).

The Carlson College of Veterinary Medicine’s DVM program is accredited by the American Veterinary Medical Association, Council on Education (COE). In addition to the DVM degree, the Oregon Veterinary Diagnostic Laboratory is accredited by the American Association of Veterinary Laboratory Diagnosticians (AAVLD), and the Lois Bates Acheson Veterinary Teaching Hospital is accredited by the American Animal Hospital Association (AAHA).

Student Health Services is accredited by the Accreditation Association for Ambulatory Health Care (AAAHC) and is a member of the American College Health Association (ACHA). The Student Health Services Laboratory is accredited by the Commission on Office Laboratory Accreditation (COLA).

The university’s Counseling and Psychological Services (CAPS) office is accredited by the International Association of Counseling Services, Inc. (IACS), and the pre-doctoral training program at CAPS is accredited by the American Psychological Association (APA).

The Oregon State University Institutional Animal Care and Use Program is fully accredited by AAALAC International. OSU’s participation in the
Accreditation (https://leadership.oregonstate.edu/provost/university-accreditation/) webpage.

The Academic English and General English programs at INTO OSU are accredited by the Commission on English Language Program Accreditation (CEA). INTO OSU agrees to uphold the CEA Standards for English Language Programs and Institutions. CEA is recognized by the U.S. Secretary of Education as a national accrediting agency.

For further information about OSU's accredited programs, visit the OSU Accreditation (https://leadership.oregonstate.edu/provost/university-accreditation/) webpage.

Innovation, Leadership and Excellence for Oregon and the World

Oregon State University is a community of students, faculty, staff, alumni and supporters who aspire to make the world a better place. It is a community defined by innovation, leadership and excellence in academics, research and outreach to serve Oregon, the nation and the world.

With more than 31,000 students, including more than 5,600 students earning their degrees entirely online, Oregon State is the state’s largest university, welcoming a diverse student body from all 36 counties across Oregon, all 50 states and more than 100 countries.

Oregon State is the state’s land grant university and is one of only two universities in the U.S. to have land, sea, space and sun grant designations. As a premier international research university, with a record $336 million in external research funding in 2016, Oregon State’s impact reaches across the state and beyond.

Oregon State’s 2015 strategic plan reaffirms the university’s commitment to the three Signature Areas that draw from disciplines across the university and integrate research, engagement and teaching at both graduate and undergraduate levels:

- Advancing the Science of Sustainable Earth Ecosystems
- Improving Human Health and Wellness
- Promoting Economic Growth and Social Progress

Students Come First

- Oregon State is committed to diversity. Our students come from all walks of life and from all over the world. These students are extraordinarily bright and high-achieving contributors in the classroom and in their communities. Over the past five years, more of Oregon’s high school valedictorians and salutatorians have enrolled at Oregon State than at Oregon’s other public research universities.
- Oregon State offers a full range of strong scholarships, grants, work-study and loans from federal, state and university sources to help students get the best possible financial aid package.

- OSU Welcome Week begins at fall move-in and includes the first day of classes. This week is filled with events and activities for everyone, including Welcome Week Kick-off and Rec Night, new student convocation, student club events and many other educational and social activities geared toward connecting new students and welcoming returning students back to the university and Corvallis.
- Our First-Year Experience program helps new students transition into university life. A variety of small-group experiences is offered — including U-ENGAGE and first-year experience courses — to connect first-year students to faculty, current Oregon State students and other new students.
- The University Exploratory Studies Program allows students to explore a variety of disciplines before choosing an academic major.
- Our Diversity and Cultural Engagement office, cultural centers and Educational Opportunities Program work with African American, Asian American, Native American and Latino students to ensure that their Oregon State experience is positive.
- Oregon State is the only college or university in the state that offers ROTC programs for all four branches of the military — Air Force, Army, Marines and Navy.
- With more than 400 student organizations, plus club, intramural and Pac-12 Conference sports, students find it easy to keep busy at Oregon State.

Oregon Is Our Campus

- OSU Ecampus, with more than 45 undergraduate and graduate programs and over 1,000 courses, is consistently ranked in the top 10 among online bachelor’s degrees nationwide by U.S. News & World Report and is ranked number one in value by valuecolleges.com (http://valuecolleges.com).
- The OSU Extension Service has programs, staff and volunteers providing essential services in all 36 Oregon counties.
- Consistently ranked among the top college towns in the nation, Corvallis is a welcoming, vibrant city of 55,000 people, offering a wide range of community, recreation, dining, shopping and cultural opportunities. And the city is just an hour or more from the Oregon Coast, the snow-capped Cascade Range and Portland — Oregon’s largest city.

Mission

Preamble

Oregon State University is a comprehensive, public, internationally recognized research university. As one of only two land, sea, space and sun grant universities in the country (Penn State being the second), OSU offers programs and employs faculty and staff in every county of the state. OSU views the state of Oregon as its campus and works in partnership with all of Oregon’s community colleges and the state’s public and private colleges and universities to serve Oregonians’ educational needs.

Mission

As a land grant institution committed to teaching, research, and outreach and engagement, Oregon State University promotes economic, social, cultural and environmental progress for the people of Oregon, the nation and the world. This mission is achieved by producing graduates competitive in the global economy, supporting a continuous search for new knowledge and solutions and maintaining a rigorous focus on academic excellence, particularly in the three Signature Areas: Advancing
the Science of Sustainable Earth Ecosystems; Improving Human Health and Wellness; and Promoting Economic Growth and Social Progress.

**Vision**

To best serve the people of Oregon, Oregon State University will be among the Top 10 land grant institutions in America.

**Goals**

1. Provide outstanding academic programs that further strengthen performance and pre-eminence in the three Signature Areas of Distinction: Advancing the Science of Sustainable Earth Ecosystems; Improving Human Health and Wellness; and Promoting Economic Growth and Social Progress.

2. Provide an excellent teaching and learning environment and achieve student access, persistence and success through graduation and beyond that match the best land grant universities in the country.

3. Substantially increase revenues from private fundraising, partnerships, research grants and technology transfers while strengthening our ability to more effectively invest and allocate resources to achieve success.

**Core Values**

**Accountability.** We are committed stewards of the human, fiscal and physical resources entrusted to us. We are also stewards of the loyalty and good will of the people of Oregon; the university’s students, faculty, staff, alumni, and donors; and the communities in which we live and work.

**Diversity.** We recognize that diversity and excellence go hand-in-hand, enhancing our teaching, scholarship, and service as well as our ability to welcome, respect, and interact with other people.

**Integrity.** We value responsible, accountable and ethical behavior in order to maintain an atmosphere of honest, open communication and mutual respect throughout the Oregon State community.

**Respect.** We treat each other with civility, dignity and respect.

**Social responsibility.** We contribute to society’s intellectual, cultural, spiritual and economic progress and well-being to the maximum possible extent.

**Core Themes**

The core themes and their objectives were selected to align with the OSU Strategic Plan, the university’s mission and its three fundamental goals. The following core themes were chosen in early 2010:

- Undergraduate education
- Graduate education and research
- Outreach and engagement

Beginning in the fall of 2010, the university has introduced a Core Theme Planning process that will be conducted on an annual cycle and use continuous improvement principles to inform the campus community of how we are fulfilling our mission.

**Source: OSU Strategic Plan**

Founded in 1858 as a small, private academy called Corvallis College, Oregon State University has developed into an internationally recognized public research university.

College-level courses were introduced into the curriculum about 1865, and two men and one woman fulfilled the requirements for baccalaureate degrees in 1870, becoming the first graduates of a state-assisted college in the western United States.

Signed into law by President Abraham Lincoln on July 2, 1862, the Morrill Act provided grants of land to be used by states for the sole purpose of endowing, supporting and maintaining public colleges. The Oregon Legislative Assembly designated Corvallis College as the state’s land grant institution on October 27, 1868. This was the first state support for higher education in Oregon. Permanent adoption as the state’s agricultural college came in 1870.

For many years, the institution was known as Oregon Agricultural College. The name was changed to Oregon State College in 1953 and to Oregon State University in 1961.

Following the designation of the college as a land grant institution, agriculture was added to the existing arts and science curriculum in 1869. The curriculum continued to expand, with professorships in commerce (1880), agriculture (1883), household economy (1889) and engineering (1889) resulting in the establishment in 1908 of the professional schools of commerce, agriculture, engineering and mechanic arts and domestic science and arts. The first summer session was also held in 1908.

Curricular growth continued with the schools of forestry (1913), mines (1913), pharmacy (1917), education (1918), basic arts and sciences (1922) and health and physical education (1931).

In 1932, the Oregon State Board of Higher Education established the School of Science for the state system at Corvallis, eliminated the School of Mines, and reduced the School of Health and Physical Education to a division. Major work in business administration was discontinued but was reinstated when the College of Business was established (first as a division) in 1943. The College of Liberal Arts was established (as the School of Humanities and Social Sciences) in 1959. The Department of Oceanography was established in 1959, became the School of Oceanography in 1972 and the College of Oceanography in 1983. In 1992, the Department of Atmospheric Sciences in the College of Science was merged with the College of Oceanography and renamed the following year as the College of Oceanic and Atmospheric Sciences. In 2011, the Department of Geosciences in the College of Science was merged with COAS, and the college renamed the College of Earth, Ocean, and Atmospheric Sciences. The College of Health and Physical Education (now the College of Public Health and Human Sciences) was reinstated (as a school) in 1974, and the College of Veterinary Medicine was established (as a school) the following year. In 1983, all schools of the university, except the School of Education, were re-designated as colleges. In 1989, the School of Education became a college. In 1991, the College of Education merged with the College of Home Economics, and within the College of Home Economics and Education, was renamed the School of Education. In 1995, the University Honors College was established. In 2002, the College of Health and Human Performance and the College of Home Economics and Education were merged into the College of Health and Human Sciences. As part of this restructuring, the new School of Education became an independent academic unit. In 2005, the School of Education was renamed the College of Education. The College of Health and Human Sciences was renamed the College of Public Health and Human Sciences in 2011.

Following the approval of legislation adopted by the 2013 Oregon Legislature, Oregon State University made the decision to have its own institutional board of trustees. That board was appointed by Oregon
Governor John Kitzhaber in the fall of 2013 and assumed all of its official duties on July 1, 2014.

Presidents of the institution since its founding:

William A. Finley, 1865–72;  
Benjamin L. Arnold, 1872–92;  
John M. Bloss, 1892–96;  
Henry B. Miller, 1896–97;  
Thomas M. Gatch, 1897–1907;  
William Jasper Kerr, 1907–32;  
George Wilcox Peavy, 1934–40;  
Frank Llewellyn Ballard, 1940–41;  
August Leroy Strand, 1942–61;  
James Herbert Jensen, 1961–69;  
Robert William MacVicar, 1970–84;  
John V. Byrne, 1984–95;  
Paul G. Risser, 1996–2002;  

Acting presidents of the institution since its founding:

Joseph Emery, 1872  
John D. Letcher, 1892  
George Wilcox Peavy, 1932–34  
Francois Archibald Gilfillan, 1941–42  
Roy Alton Young, 1969–70  
Timothy P. White, 2003
ADMISSION TO OREGON STATE UNIVERSITY

Oregon State University welcomes all students without regard to race, creed, sex, marital status, sexual preference, age, religion, handicap, or national origin who provide evidence of suitable preparation for course work at the university level.

Office of Admissions
B104 Kerr Administration Bldg.
Oregon State University
Corvallis, OR 97331

Phone: 541-737-4411
Toll free: 800-291-4192
Fax: 541-737-2482
OSU code for SAT, AP, TOEFL, or CLEP reports: 4586
OSU code for ACT reports: 3482

Email: osuadmit@oregonstate.edu
Website: http://admissions.oregonstate.edu
Admission application: http://admissions.oregonstate.edu/apply-choose-application (http://admissions.oregonstate.edu/apply-choose-application/)

Information for undergraduate, postbaccalaureate, nondegree undergraduate students is available from the Office of Admissions.

Administration
Noah Buckley, Director, 541-737-0583
Alex Galbreath, Associate Director, 541-737-3418
Zack Hermann, Assistant Director, 541-737-9841
Erin Rau, Associate Director, 541-737-0579
Shelby Towns, Assistant Director, 541-737-2499
Blake Vawter, Sr. Associate Director, 541-737-9807
Heather Wofford, Sr Assistant Director, 541-737-9808

Admission Requirements for First-Year Students

When to Apply
See application deadlines are available online (http://admissions.oregonstate.edu/undergraduate-admission-deadlines/).

The application and fee must be submitted electronically by the respective deadline.

The Admission Process
Apply online (http://admissions.oregonstate.edu/apply-choose-application/). Applicants are required to use a valid Visa, MasterCard, or Discover credit card to pay the $65 nonrefundable application fee. Request that your high school send your official high school transcript to OSU, and have your official SAT or ACT test scores sent to OSU.

Portfolios, videotapes, essays, and personal interviews are generally not required.

Evaluation Process

Admission to Oregon State University is selective and competitive and is based on a holistic review of application materials.

Complete applications are first reviewed to confirm successful completion of the 15 high school subject requirements and GPA earned. There is no minimum SAT or ACT score requirement. However, official scores from one of these tests are required for admission and advising purposes for students applying during their senior year of high school.

Applicants for undergraduate admission are required to complete an ‘Insight Résumé,’ a written assessment designed to evaluate students’ non-cognitive attributes. These attributes include self-concept, realistic self-appraisal, handling the system, ability to set long-range goals, leadership, connections with a strong support person, community engagement, and nontraditional learning.

Academic performance is not the sole criterion for admission to the university. The university may evaluate a person’s behavior and background to determine their ability to maintain the standards of academic and professional conduct expected at the university. An evaluation may take into consideration current behavior and performance as well as past experiences and actions. Simply qualifying for admission does not guarantee admission.

Applicants can see when they will be notified of their admission status online (http://admissions.oregonstate.edu/admission-requirements-0/#Notification%20of%20status).

Policy Regarding Students' Eligibility to Return to Prior College

Applicants who disclose that they are ineligible to re-enroll at any college or university that they attended within the last seven years for student conduct reasons will be automatically declined admission to OSU. Applicants who disclose that the reason for their ineligibility is for academic reasons may be admitted if they meet OSU’s minimum academic requirements.

Applicants who are denied admission have the right to appeal that decision, and appeals will be reviewed on a case-by-case basis.

Selection of First-Year Students

OSU’s admission requirements promote student success by assessing preparedness and academic potential in the unique context of each student’s personal experience. Admission assessment will consider all achievement, both academic and nonacademic, to enroll students with a broad range of characteristics and perspectives. These include, but are not limited to academic achievement, creativity, initiative, motivation, leadership, persistence, service to others, intellectual curiosity, exceptional personal or academic recognition, unusual talent or ability, substantial experience with other cultures, and ability to overcome significant challenges.

The admissions process provides a fair and comprehensive review of all applicants for determining potential success at OSU. It is crucial that applicants carefully complete the application process by providing thorough information. Estimating the likelihood of admission is very difficult without considering the complete application file.
Regular Admission
Initial admission selections are based on a holistic assessment of the criteria listed below.

Strength of Curriculum:
- Quality, quantity, and level of course work throughout the entire high school program, especially course work completed beyond the minimum courses required (See the high school course requirements chart.)
- Advanced placement (AP), international baccalaureate (IB), or college course work completed or in progress
- Strength of the program taken within the context of the high school attended
- Progressively challenging math sequence (including Algebra II), demonstrated by performance

Academic Performance:
- A recommended unweighted high school grade-point average of 3.0 (on a 4.0 scale as calculated by the Office of Admissions)
- Class rank taken in context with academic rigor and size of high school attended
- Performance on standardized tests: SAT or ACT.

Insight Résumé:
- Understanding of you as a unique, contributing individual
- Your accomplishments, perspectives, experiences, and talents
- Your achievements within the context of your social and personal circumstances
- Participation in activities that develop academic, intellectual, and leadership abilities

Insight Résumé scores are also used for scholarship selection, secondary review of applicants who do not meet admission requirements, and compiling baseline data.

Extended Admission (Admission Appeals)
Students not selected for regular admission may appeal via the extended admission process. Extended admission decisions will be determined by the Undergraduate Admissions Committee. In addition to regular admission requirements, students participating in the extended admission review will be asked to provide additional materials for consideration. Please refer to the OSU Office of Admissions website (http://admissions.oregonstate.edu/admission-appeals-aka-extended-admissions/) for specifics.

High School Course Requirements
This is supposed to be a 3-column table.

<table>
<thead>
<tr>
<th>College Preparatory Subjects</th>
<th>Minimum Units</th>
<th>Grades of C- or higher are required.</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4 years</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>3 years</td>
<td>Culminating at the Algebra II level or higher</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3 years</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>3 years</td>
<td>One year each of two different sciences (biology, chemistry, physics, etc.). One year of lab strongly recommended.</td>
</tr>
</tbody>
</table>

Alternatives to Subject Requirements
Students unable to fulfill the subject requirements will be eligible for consideration by:

1. Taking SAT II Subject Tests
   Or
2. Successfully completing course work (high school or college transfer) for specific subject deficiencies.

Alternatives should be completed by high school graduation.

Test Requirements
Freshman applicants (except those applying on the basis of GED scores) must submit Scholastic Assessment Test (SAT-Reasoning) or American College Test (ACT) scores. Test scores are used to determine course placement and are considered for applicants not meeting the minimum high school GPA requirement.

Official scores are required.

The institutional code for having most test scores sent to OSU is 4586. The OSU ACT code is 3482.
High School Graduation
Public high school students must graduate from standard high schools.\(^1\)
Private high school students must graduate from regionally or state accredited high schools.\(^2\)

1 Standard high schools are public high schools that are certified as meeting specified levels of resources, services, and quality established by the Oregon Department of Education.
2 Accredited high schools are those that are reviewed and recognized by a regional entity, such as the Northwest Association of Schools and Colleges, as meeting an appropriate level of academic rigor and support.

Graduates of Nonstandard or Unaccredited High Schools or Home-Schooled Students
Graduates of non-standard or unaccredited high schools, or home-schooled students will be considered for admission based on a holistic assessment using the following:

SAT and/or ACT
OSU requires students applying for admission during their senior year to submit SAT or ACT scores.

OSU prefers, but does not require, the essay portion of the new SAT test that began being administered in March 2016.

Note: Only scores sent electronically from College Board (SAT) and/or ACT will be considered official and used for admission purposes. There is not an advantage to pay extra for ‘rush’ scores from the testing agency, and in some cases may add to the time it will take to process the scores within our office.

The SAT college code for Oregon State University is 4586. The ACT college code for Oregon State University is 3482.

SAT subject tests
OSU requires students graduating from non-regionally accredited high schools and home-schooled students to provide scores from two SAT subject tests (Math I or II, and a second exam of the student’s choice).

Students who have 12 or more completed college credits in core subject areas (Math, Writing/English, Science) while pursuing their high school diploma will be considered as an alternative to the two SAT subject tests.

Insight Résumé
OSU seeks to look beyond grades and test scores to determine if applicants bring the necessary skills and abilities to be successful here.

Your answers to the Insight Résumé, which is part of the OSU application for admission, provides us with:

• Understanding of you as a unique, contributing individual.
• Your accomplishments, perspectives, experiences, and talents.
• Your achievements within the context of your social and personal circumstances.
• Participation in activities that develop academic, intellectual, and leadership abilities.

Additional Factors
• Oregon State is also looking for students who will lend educational and cultural diversity to our campus. We are looking for students who go above and beyond the minimum whether in talent, academic ability or potential. Combined with academic strengths, evidence of these characteristics may be considered in our review of applicants for admission.
• Applicants who are ineligible to re-enroll at any college or university that they attended within the last seven years for student conduct reasons will be automatically declined admission at OSU. Applicants who are unable to re-enroll at a previous college or university for academic reasons may be considered for admission if they meet OSU’s minimum academic requirements.

Please note that academic performance is not the sole criterion for admission to the university. The university may evaluate a person’s behavior and background to determine their ability to maintain the standards of academic and professional conduct expected at the university. An evaluation may take into consideration current behavior and performance as well as past experiences and actions.

GED Students
GED students will be considered for admission if they achieve an average GED score of at least:

• 58, if taken prior to January 2002, with no subtest score less than 41
• 580, if taken between January 2002 and December 2013, with no subtest score less than 410
• 680 (total from 4 subject tests), if taken in January 2014 or later, with no subtest score less than 150

Students who take the GED test in the 1996–97 school year and later must pass two years of the same foreign language prior to admission or an approved additional way to meet OSU’s foreign language requirement. Foreign language taken at an unaccredited high school does not qualify. If you have questions pertaining to these guidelines, please contact the OSU Admissions Office regarding your options for completion of this requirement.

Non-cognitive skills and abilities demonstrated via a GED applicant’s Insight Résumé (see above) are also considered in making admission decisions.

Applicants admitted on the basis of GED scores are not required to submit SAT or ACT scores, but scores may be considered if available.

Petition for Admission Consideration
Students not approved for admission may appeal via the extended admission process. Eligible students will be provided with information about the petition procedure. Deadlines are in effect each term for appeals. For additional information, please refer to the OSU Office of Admissions website (http://admissions.oregonstate.edu/admission-appeals-aka-extended-admissions/).

Advanced Placement (AP) Credit
Oregon State University awards ungraded credit for achievement on certain College Board Advanced Placement (AP) examinations. Information pertaining to specific AP credit policies is available in high school counseling centers or may be obtained from the OSU Office of Admissions website (http://admissions.oregonstate.edu/?q=credit-opportunities/). OSU’s college code is 4586 for those wishing to have their scores sent.

International Baccalaureate Credit
Oregon State recognizes IB achievement by awarding credit to students who score 5 or above on standard and higher level IB exams. OSU also
grants additional benefits for students who complete the full IB diploma with a score of 30 or higher, as follows:

**Sophomore Standing**, and **IB Scholarships** are available. Students with a total score on IB exams of 30 or higher may choose to accept the annual, renewable scholarship award of at least $3,000 OR may compete for more substantial awards.

Students must send their official test scores to OSU. The official International Baccalaureate Certificate is required in order to award credit.

Contact your IB coordinator or IB North America to request score reports.

IBO North America
212-696-4464
http://www.ibo.org/

**Transfer Admission**

**When to Apply**
Apply online (http://admissions.oregonstate.edu/apply-choose-application/). Applicants are required to use a valid Visa, MasterCard, or Discover credit card to pay the $65 nonrefundable application fee. Official transcripts must be sent to OSU from each college or university attended.

Please refer to the OSU Office of Admissions website (http://admissions.oregonstate.edu/undergraduate-admission-deadlines/) for application deadlines.

**Minimum Requirements for Admission Consideration**

**U.S. Citizens and Permanent Residents:**

1. Successful completion of no less than 24 quarter (16 semester) graded, transferable credits from (a) regionally accredited U.S. institution(s). Students with fewer than 24 graded transferable quarter hours will be considered on the basis of their high school records and test scores, and must have a 2.25 GPA on all collegiate work attempted.

2. Only college-level, transferable credits are counted in those accepted in the GPA computation (professional-technical course grades are not included).

3. Students with 24 quarter (16 semester) graded, transferable credits from (a) regionally accredited U.S. institution(s) and a transfer GPA of 2.25 or above will be considered for admission if they have earned a C- or better in the following courses:
   - College-level writing equivalent to WR 121
   - Mathematics equivalent to MTH 111 – OR – MTH 105
   - Two terms of the same foreign language in college will be required of those high school graduates of the class of 1997 and beyond who did not successfully complete two units (years) of foreign language while in high school. Additional information on how to meet foreign language deficiencies can be found online (http://admissions.oregonstate.edu/sites/admissions.oregonstate.edu/files/dfl-ways_to_meet.pdf).

4. Students with 24 quarter (16 semester) graded, transferable credits from (a) regionally accredited U.S. institution(s) and a transfer GPA of 2.50 or above will be considered for admission if they have earned a C- or better in the following courses:
   - College-level writing equivalent to WR 121
   - Two terms of the same foreign language in college will be required of those high school graduates of the class of 1997 and beyond who did not successfully complete two units (years) of foreign language while in high school. Additional information on how to meet foreign language deficiencies can be found online (http://admissions.oregonstate.edu/sites/admissions.oregonstate.edu/files/dfl-ways_to_meet.pdf).

5. Applicants who are ineligible to re-enroll at any college or university that they attended within the last seven years for student conduct reasons will be automatically declined admission at OSU. Applicants who disclose that the reason for their ineligibility is for academic reasons may be admitted - if they meet OSU's minimum academic requirements.

6. Applicants who are denied admission may be eligible to appeal that decision, and appeals will be reviewed on a case-by-case basis. Consult with the Office of Admissions for more information on the appeal process.

Please note that meeting the minimum admissions requirements and/or an individual’s academic performance does not guarantee them admission to the university. Applicants’ experiences, actions, and non-cognitive skills are assessed by way of the Insight Résumé. Furthermore, the university may evaluate a person’s behavior and background to determine their ability to maintain the standards of academic and professional conduct expected at OSU.

Consideration will be given to applicants with a 2.00 GPA and an Associate of Arts Oregon Transfer (AAOT) degree from an Oregon community college, but admission is not guaranteed.

**Evaluation and Transferability of Credit**

Only official records are used to evaluate eligibility for admission and transferability of credit.

Official transcripts of all college work attempted must be submitted directly from the Registrar's Office of each institution.

OSU considers transfer college-level courses successfully completed at colleges or universities regionally accredited by an appropriate accreditation agency.

Persons transferring coursework from community college or two-year institution(s) to OSU may have up to 124 quarter credits (83 semester units) accepted toward their bachelor’s degree. One semester credit equals 1.5 quarter credits at OSU.

For information on OSU’s acceptance of professional-technical courses, please see Academic Regulation 2.

**CLEP**

Applicants who want credit for College-Level Examination Program (CLEP) tests should have official test scores sent to Admissions using college code 4586. Additional details are available in the OSU Credit Opportunities brochure and on the OSU Admissions website.

Acceptance of Credit from a Two-Year Institution (OSU Academic Regulation 2) (p. 16):
Transfer Credit From Regionally Accredited Institution(s) (Undergraduate Students)

a. College Transfer Credits: Oregon State University accepts college level credit toward a baccalaureate degree completed at regionally accredited institutions. Transfer credits and grades are not used in calculating the OSU cumulative GPA. For Institutional Requirements for Baccalaureate Degrees, see AR 25. Students are encouraged to work with the relevant academic unit to ensure that transfer credits meet department and college requirements for the degree.

Community colleges credits will be limited to 124 lower-division quarter credits. It would be unlikely for an individual student to be able to use all 124 credits toward an OSU baccalaureate degree.

Students who hold OSU-approved direct transfer degrees from Oregon or other accredited community colleges (e.g., the Associate of Arts Oregon Transfer) or who have 90 or more credits accepted in transfer will be granted junior standing.¹ Students who hold OSU-approved direct transfer degrees will be considered to have met the Perspectives and Skills (except WIC) areas of the Baccalaureate Core. In addition, they must complete the upper-division Synthesis areas of the core. Students transferring from Oregon or other accredited community colleges who do not hold approved direct transfer degrees ordinarily will be given baccalaureate core credit in the Perspectives and Skills area on a course-by-course basis for work that is judged to be equivalent in content.

b. Transfer of Professional-Technical Credits: a maximum of 12 quarter credits (8 semester credits) of professional-technical course work applicable in an associate’s degree or certificate program at an accredited institution can be accepted upon admission to OSU as general elective credit (graded as Pass) and as part of the 124-quarter credit total that can be applied toward a baccalaureate degree.

c. Transfer of Professional-Technical Course Credits through Articulation Agreements: Lower-division OSU credit may be awarded for specific professional-technical community college courses when those courses are validated by articulation agreement with the appropriate OSU department. This may be above the 12 quarter credits of general electives (graded as Pass) allowed when a student is admitted to OSU. Credit will be awarded only upon the recommendation of the appropriate department and college, and approval by the Curriculum Council. Community college professional-technical course work is not equated to upper-division OSU course work. These course credits will count as part of the 124 quarter credits defined in paragraph 2a above. OSU departments who have articulation agreements with community colleges regarding community college professional-technical courses shall review the agreements annually and forward a dated list of the articulated community college courses to the Curriculum Council.

¹ Junior standing does not necessarily imply that OSU institutional, college, division, and/or departmental requirements, which are normally satisfied by OSU students prior to their junior year, have been satisfied.

Nondegree Status

Nondegree enrollment status is designed for students who want to take courses but do not want to pursue a degree. In some instances, nondegree students may not meet regular admission requirements. Nondegree students are part-time students who are expected to enroll in no more than 8 credits a term. Students who want to enroll for more than 8 credits a term must apply for regular admission.

Nondegree enrollment status requires no formal admission process and has no requirements for entrance. Nondegree applications should be submitted electronically. Approval is granted for a specific term. Students who are unable to attend the specific term and want to enroll later should contact the Office of Admissions (undergraduate nondegree) or the Graduate School (graduate nondegree).

Nondegree students are given grades and academic records, and are reviewed according to university standards of good academic progress.

Nondegree students who wish to seek full admission and pursue a degree must do so by submitting an undergraduate, postbaccalaureate or graduate application for admission. In all cases, an admission application fee is required. Successful enrollment as a nondegree student does not guarantee regular admission. Credits earned while enrolled under nondegree undergraduate status will be applied to a student’s record.

Nondegree graduate students who decide to seek admission to a specific degree program during the course of their studies should note that any credits taken as a nondegree student may or may not be applicable for that degree, depending upon a variety of factors, their chosen program, and the policies of the Graduate School. Graduate students are further advised that academic residency must be completed after full admission as a degree-seeking graduate student, regardless of the number of credits previously earned while in nondegree status. Please refer to Reclassification of Postbaccalaureate Students, Nondegree-Seeking Students, and Graduate Certificate Students (p. 36).

Nondegree students follow the registration procedures and policies as outlined on the Office of the Registrar website (https://registrar.oregonstate.edu/registration/). The Schedule of Classes (https://classes.oregonstate.edu/) is available online. Registering students are expected to obtain a student identification card through the ID Center.

Tuition and fees for nondegree students enrolled in fewer than 9 credits are assessed at resident rates based on undergraduate- or graduate-level course level. Payment of the health service fee is optional. Enrollment in excess of 8 credits requires that tuition and fees be assessed at the same rates as regular students and requires full admission as a regular student.

Registration holds in place prior to applying for nondegree status must be satisfied before registration as nondegree student will be allowed.

Academic Regulation 1. Admission for Nondegree Students

1. Nondegree enrollment status for undergraduate students is designed for students who wish to take 8 or fewer credits per term, but do not wish to pursue a degree or a specific postbaccalaureate credential.

2. Nondegree enrollment status for graduate students is designed for students who wish to take graduate courses, but do not wish to pursue an advanced degree. Nondegree graduate students are not limited as to the number of courses (credits) per term.

3. Credits earned as a nondegree undergraduate student may be used to satisfy degree requirements upon admission as a degree-seeking student.

4. Credits earned while enrolled as a nondegree graduate student will not necessarily apply to a graduate program upon admission to degree-seeking status. Communication with the Graduate School and specific academic programs is advised.
5. Nondegree students seeking admission to a degree program must do so by submitting an undergraduate, postbaccalaureate, or graduate application for admission.

Select a Major
Undergraduates and postbaccalaureate applicants are asked to select a college and a major within that college. The University Exploratory Studies Program is a choice available to undergraduates who are undecided about a major. Students may change their major in consultation with an academic advisor.

Admission of Postbaccalaureate Students
Admission for postbaccalaureate applicants is determined by the department, not by the Office of Admissions.

If you are interested in pursuing postbaccalaureate course work, please consult the major department before applying for admission.

Degree Seeking Postbaccalaureate
Students who would like to earn a subsequent undergraduate degree from OSU or complete prerequisites for a graduate program at OSU may apply for degree seeking postbaccalaureate admission through the Office of Admissions. Applicants for consideration must submit an admission application along with official transcripts of all college work by the application deadline. Generally, applicants must meet the following admission requirements:

- Have a bachelor's degree or equivalent from a regionally accredited institution
- 2.25 accumulated GPA requirements. The GPA is computed on the first baccalaureate degree plus any subsequent credit earned.
- Complete College Algebra and English Composition with a C– or better
- Submit Statement of Objectives of 150 to 200 words with their application
- Academic departments may impose additional requirements
- Nonrefundable $65 application fee

Please note that academic performance is not the sole criterion for admission to the university. The university may evaluate a person's behavior and background to determine their ability to maintain the standards of academic and professional conduct expected at the university.

You cannot earn a postbaccalaureate degree in the same field in which you earned your original degree.

1 Applicants wishing to be considered for admission to multiple programs must submit a new application and fee for each program.

Credential Classifications
- **Minor Credential**: Additional minor earned after undergraduate work is completed. Baccalaureate work can be completed at OSU or another institution. Students that previously completed a baccalaureate degree from Oregon State or another college cannot enter the same degree program as the degree program they graduated as an undergraduate.
- **Major Credential**: Additional major earned after undergraduate work is completed at OSU. Major credential must be completed within the same degree program.
- **Option Credential**: Additional option earned after undergraduate work is completed at OSU. Option credential must be completed within the same degree and major program.
- **Certificate**: A structured progression of courses that constitute a coherent body of study with a defined focus within a single discipline or a logical combination of disciplines. Undergraduate certificates can be earned by students without any prior degree (professionals in a field), or as a credential seeking, graduate student or as an undergraduate student in conjunction with an undergraduate degree. The certificate requirements and pre-requisites are defined at the college level.

International Applicants
International applicants should also refer to the admissions procedures (http://admissions.oregonstate.edu/international/) for undergraduate/graduate international students for deadlines, test score requirements, and additional information.

Admission with Graduate Standing
To be considered for admission to the Graduate School, an applicant must have a baccalaureate degree from a regionally accredited college or university, as well as a scholastic record, background, or other evidence that indicates the ability to do satisfactory graduate work. See Graduate Admission Procedures (p. 36) in this Catalog.

Admission of International Students (p. 41)

Admission to Summer Session
Students who wish to begin work on a degree during summer session at OSU must satisfy regular admission requirements and apply by the specified deadlines.

Admission to Professional Programs
Professional programs are accredited according to requirements set by professional societies. These programs often have more rigorous requirements for admission, continuation in the program, and acceptance of transfer credit. Therefore, admission to OSU is separate from admission to a professional program and does not guarantee such admission.

OSU-Cascades
OSU-Cascades provides students personalized instruction and OSU’s excellence in both academics and innovative research, as well as the lifelong advantages of a premier research university. OSU-Cascades is the only baccalaureate and graduate degree granting institution based in Central Oregon. OSU-Cascades expanded to a four-year university when it welcomed its first freshman class in fall 2015.
Born out of a 30-year grassroots effort put forth by Central Oregonians to bring a university to the region the university opened its doors in September 2001 on the COCC campus, offering upper-division and graduate coursework toward bachelor’s and master’s degrees.

After record enrollment growth and demonstrated financial support from the surrounding community, in August 2012 the Oregon University System endorsed OSU-Cascades’ expansion to a four-year university. In July 2013, the Oregon State Legislature approved capital funding that enabled the branch campus to establish its own campus. The branch campus completed the first phase of campus development in 2016.

OSU-Cascades features outstanding faculty in degree programs that reflect Central Oregon’s vibrant economy, abundant natural resources and commitment to sustainability. Eighteen undergraduate majors, 30 minors and options, and three graduate programs include fields such as computer science, energy systems engineering, kinesiology, hospitality management, and tourism and outdoor leadership. Experiential learning options include faculty research, internships and study abroad programs in 80 countries.

OSU-Cascades provides students excellence in academics, practical and experiential learning opportunities, and the lifelong advantages of a premier research university—all on a growing campus community of 1,300 students and faculty.

Degree Partnership Programs – Dual Admission and Enrollment at Designated Community Colleges (p. 36)

Credit for Military Experience

Students are recommended to seek advice from their Academic Advisor prior to transferring in their Military Credits. Oregon State University grants up to 45 credits for military education as recommended by the American Council on Education’s (ACE) Guide to the Evaluation of Educational Experiences in the Armed Services. This is in accordance with transfer credit policies at Oregon State University. Students may request evaluation of military credit by furnishing the Office of Admissions with a Joint Services Transcript, Navy SMART transcript, or U.S. Coast Guard transcript. Transcripts may be obtained through these homepages:

- JST (https://jst.doded.mil/official.html) Note: Some browser security settings may raise a caution message before entering these Department of Defense websites.
- Additional informational links to other service pages can be found on the ACE website (http://www.acenet.edu/higher-education/topics/Pages/College-Credit-for-Military-Service.aspx)

Oregon State University will grant 1.00 quarter credit for the course HHS 241 Lifetime Fitness Lab. For HHS 241 credit to be granted, please submit either the DD214 or an official ACE transcript. Credit will also be granted if one of the following military science courses has been completed successfully: Physical Fitness, Physical Education, or Physical Conditioning. To receive credit, please submit an official transcript from the institution.

Oregon State University will assess and award block transfer credit upon review of your military record. An evaluation report showing block transfer credits will be sent to you. For a better understanding of how each college uses the 45-credit block of general elective credits there is a web page on the OSU Veterans website (http://studentlife.oregonstate.edu/veterans/) (click on Current Students, then click on Military Credit) outlining this information. In addition, if you believe a specific military course, training, experience, etc. directly relates to a university course, you can complete a form to petition for Military Credit Course Substitution (http://studentlife.oregonstate.edu/veterans/) (click on Current Students on the right side, then click on Military Credit on the right side of the page).

Any student receiving GI Bill® education benefits while attending Oregon State University is required to obtain transcripts from all previously attended schools and submit them to the school for review of prior credit.

Footnote: GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by VA is available at the official U.S. government website (https://www.benefits.va.gov/gibill/).

Placement Examinations

High school seniors planning to enter OSU must take the SAT or the ACT. These tests provide academic advisors with valuable information about a student’s educational development, abilities, and aptitudes.

New students are required to take an online Math Placement Test (http://www.math.oregonstate.edu/mlc-placement-home/). Students who enter the university with previous language training from another institution and who wish to continue their study of the language are required to take a language proficiency examination to determine placement level. Please call the OSU School of Language, Culture, and Society at 541-737-4603. Other placement examinations may be required in certain majors.

Registration Procedures

Once admitted to Oregon State University, students are eligible for course registration. Complete registration instructions, procedures, schedules and deadlines are detailed in the Schedule of Classes (https://classes.oregonstate.edu/). A student is officially registered and eligible to attend classes only when all procedures have been completed. Students who make arrangements to pay outstanding university debts and who do not adhere to the agreed upon plan may be dis-enrolled.

In addition to the basic information regarding registration, the Office of the Registrar website (https://registrar.oregonstate.edu/registration/) is an essential resource to the student for the academic calendar, fee schedule, academic and other student regulations and procedures, final examination schedule, and listing of baccalaureate core courses.

Re-Enrollment

Undergraduate students who wish to re-enroll in the university after an absence may do so providing they were eligible to re-enroll their last term of attendance. Students who have been absent four or more terms, not including summer terms, should contact the Office of the Registrar to reactivate their records, at which time the current catalog becomes their catalog of record for graduation requirements. The university reserves the right to consider a student’s status with respect to voluntary or involuntary leave, as well as any existing student conduct issues when requesting to re-enroll. Students who have been absent less than four terms are still considered active and register following the registration instructions on the Office of the Registrar website (https://registrar.oregonstate.edu/registration/). International students who wish to re-enroll after an absence should check in with the Office
of International Services (p. 1084) (OIS) to make sure they have the required documents to return.

Re-enrolling students who have attended another college or university since their last term at OSU are required to report that enrollment at the time of re-entry. Official transcripts must be forwarded to the Office of Admissions. Returning students with an OSU cumulative GPA below or very near 2.00 are reminded of the OSU graduation requirement (Academic Regulation 25e (p. 16)), which stipulates 2.00 as the minimum OSU cumulative grade-point average required to earn a baccalaureate degree from OSU.

All re-enrolling students are reminded of their responsibility to update any outdated information, such as address, in their OSU records. Contact the Office of the Registrar to make changes.

Degree Partnership Programs

Dual Admission and Enrollment at Designated Community Colleges

Oregon State University offers special Degree Partnership Programs (dual admission and enrollment) with all of Oregon’s community colleges:

1. Blue Mountain Community College (http://www.bluecc.edu/) in Pendleton
2. Central Oregon Community College (http://www.cocc.edu/) in Bend
3. Chemeketa Community College (http://www.chemeketa.edu/) in Salem
4. Clackamas Community College (http://www.clackamas.cc.or.us/) in Oregon City
5. Clatsop Community College (http://www.clatsopcollege.com/) in Astoria
6. Columbia Gorge Community College (http://www.cgcc.edu/admissions/) in The Dalles
7. Klamath Community College (http://www.klamathcc.edu/Home/) in Klamath Falls
8. Lane Community College (http://www.lanecc.edu/) in Eugene
9. Linn-Benton Community College (http://www.linnbenton.edu/) in Albany
10. Mt. Hood Community College (http://www.mhcc.edu/) in Gresham
11. Oregon Coast Community College (http://www.oregoncoastcc.org/) in Newport
12. Portland Community College (http://www.pcc.edu/)
13. Rogue Community College (http://www.roguecc.edu/) in Medford
14. Southwestern Oregon Community College (http://www.socc.edu/) in Coos Bay
15. Tillamook Bay Community College (http://tillamookbaycc.edu/) in Tillamook
16. Treasure Valley Community College (http://www.tvcc.cc.or.us/) in Ontario
17. Umpqua Community College (http://www.umpqua.edu/) in Roseburg

OSU also has Degree Partnership Programs with three of Hawaii’s seven community colleges:

1. Hawai’i Community College (http://hawaii.hawaii.edu/) in Hilo, Hawaii (Big Island)
2. Kapi’olani Community College (http://www.kapiolani.hawaii.edu/) in Honolulu, Oahu
3. Maui College (http://maui.hawaii.edu/), University of Hawaii, in Kahului, Maui

These programs provide students with simultaneous access and admission/enrollment status at both OSU and the community college. There is one application process to attend both schools, advising is available at either campus, and the student has the opportunity to access services and participate in college life on both campuses. There is flexibility in scheduling with access to more classes, financial aid is available for qualified students while attending both schools, and admitted students have access to library and computer lab resources at both campuses. For more information on Degree Partnership Programs (dual admission and enrollment), please contact the admissions office at the community college, OSU Degree Partnership Student Program, 541-737-2790, or the University Partnership Programs website (http://partnerships.oregonstate.edu/).

Transfer Student Services and Degree Partnership Programs
B102 Kerr Administration Bldg.
Oregon State University
Corvallis, OR 97331
Phone: 541-737-2562
Websites: http://transfer.oregonstate.edu (http://transfer.oregonstate.edu) and http://partnerships.oregonstate.edu/

Rick DeBellis, Associate Director for Enrollment Management
Degree Partnership Programs
Phone: 541-737-2790

Jose Ceja Garibay, Transfer Student Services Manager
Application deadlines for Degree Partnership Programs vary. Please refer to the DPP website (http://partnerships.oregonstate.edu/dpp-students/application-deadlines/) to ensure that you meet the appropriate deadline.

Graduate School Admission

Graduate Admissions Requirements

Oregon State University offers admission to applicants whose records demonstrate the highest potential for graduate study and promise for substantial contribution to both their academic professions and to a diverse, global society. The university fosters an environment that welcomes inclusiveness.

Admission decisions are based on many factors, such as the quality of the applicant’s prior academic degree and record of accomplishment, statement of purpose, letters of recommendation from professors or others familiar with the applicant’s academic work, performance in aptitude and achievement tests, relevant work experience, preparation in the proposed field of study, and the connection of the applicant’s academic goals with the faculty’s research interests.

Requirements

The following minimum entrance requirements guide the university and its graduate programs in the consideration of applicants for graduate admission:

- A four-year baccalaureate degree (or international equivalent), a professional degree (such as BPharm, BVSc, MBBS, MD, DVM, DPharm, etc.), or an appropriate U.S./Canadian alternative degree,
from a regionally accredited (US) or recognized (International) college or university, with
• A cumulative B average (equivalent 3.00 on a U.S. 4.00 grading scale) on the most recent baccalaureate degree or equivalent or any subsequent graduate degree from a regionally accredited (US) or recognized (International) college or university, plus all work completed thereafter.

The graduate program may choose to calculate the GPA on the last 90 quarter credits (60 semester credits [last two years on an international record]) of graded undergraduate work on the most recent baccalaureate degree, plus all work completed thereafter, as the basis for admission.

Minimum GPA for admission to only graduate certificate programs is set by the departments that supervise the certificates. Applicants requesting admission to only graduate certificate programs should contact their academic program to learn about minimum GPA and other admission requirements.

OR:
• A four-year baccalaureate degree (or international equivalent), a professional degree, or an appropriate U.S./Canadian alternative degree, from a regionally accredited (US) or recognized (International) college or university, and
• A 45-quarter credit equivalent graduate degree from a regionally accredited (US) or recognized (International) college or university, with
• A cumulative B average (equivalent 3.00 on a U.S. 4.00 grading scale) on the most recent graduate degree.

If the applicant has completed his or her baccalaureate degree in a country that is a signatory of the Bologna Declaration, then:

• A Bologna compliant baccalaureate degree of at least three years duration from a recognized college or university, with
• A cumulative B average (equivalent 3.00 on a U.S. 4.00 grading scale) on the degree, plus all subsequent graded course work.

OR (Other three-year bachelor degree holders):
• A non-Bologna compliant baccalaureate degree of at least three years duration from a recognized college or university, and
• A 45-quarter credit equivalent graduate degree from a recognized college or university, with
• A cumulative GPA of at least 3.00 on the most recent graduate degree.

Graduate programs also have the option of validating that specific professional and/or three-year degrees appropriately prepare students for their graduate admission.

### International Requirements
All international graduate applicants must meet the following additional requirements:

- Documentation of sufficient financial resources to attend Oregon State University as a graduate student.
- Documentation of English language proficiency

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<thead>
<tr>
<th>Test</th>
<th>Regular Admission</th>
<th>Transitional Admission-TAP (formerly Conditional Admission-CAP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOEFL Paper based</td>
<td>550</td>
<td>500-547</td>
</tr>
<tr>
<td>Internet (iBT) TOEFL</td>
<td>80 Minimum score of 18 on each section</td>
<td>60-79 or any sub-score less than 18</td>
</tr>
<tr>
<td>Applicants awarded GTA</td>
<td>80 Minimum score of 22 on Speaking sub-score and Minimum score of 18 on all other sections</td>
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<tr>
<td>IELTS</td>
<td>6.5</td>
<td>6.0</td>
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**Please note:** OSU requires graduate applicants to meet or exceed all five iBT scores to be eligible for full admission. Scores must be no more than two years old at the time of the applicant's first term of registration.

### Waived from English Language Testing
The English language proficiency requirement is waived for applicants who have demonstrated success by achieving an overall GPA greater than 3.0 on a 4.0 scale for two or more semesters/quarters in a rigorous undergraduate or postgraduate program in the U.S. or from one of the following English speaking countries: Australia, Canada, New Zealand, and United Kingdom.

1 Waivers for applicants in other countries are considered on a case-by-case basis if the medium of instruction is English. The individual program must petition the Graduate School for a waiver. Not all programs will request a waiver. Please contact your proposed graduate program to inquire about their policy.

### English Language Exceptions
Individual programs may request exceptions to the minimum English language proficiency requirements. Exceptions to the minimum TOEFL score/sub-score requirements will be considered by the Graduate School Dean on request if:

- Applicant's GRE Verbal score is greater than 500 (153 – revised GRE)
- The chair of the Graduate Program (or designated faculty member)
  - Has personally interviewed the applicant and established a plan for language support for the applicant, if needed, which may include additional English Language Training,
  - The Graduate Program arranges for the applicant to complete language training at INTO OSU equivalent to the admission status as designated by the Transitional Admission Program-TAP

### Transitional Admission Program
Transitional admission based on English language proficiency may be granted to applicants seeking admission to a graduate degree program. University transitional admission of international applicants may be granted only if the applicant is otherwise fully admissible.

Transitional admission for degree-seeking applicants requires:

- Compliance with a specified plan for English and academic course work during each quarter until such time as the applicant qualifies for regular admission.
• Individual graduate programs may require additional documents such as GRE and GMAT test results or set higher English and academic standards. For detailed information, refer to the website for Graduate Admissions and individual graduate program websites.

Transitional admission based on English language proficiency is not granted to applicants seeking admission to only a graduate certificate program.

All international applicants seeking graduate teaching assistantships should refer to the International Graduate Teaching Assistant English Language Requirement (p. 1054) section of this catalog for more details.

Admission Requirements Continued

Applicants not meeting minimum academic requirements still may be considered for admission with the support of their academic program, plus review and approval by the University Graduate Admissions Committee. For these applicants, decisions may rely more heavily on noncognitive criteria. However, the university encourages those applicants whose overall cumulative undergraduate GPA is less than an equivalent 3.00 on a U.S. 4.00 grading scale to take the GRE.

Applicants whose baccalaureate degrees are awarded by an institution that issues non-graded transcripts will be considered for admission with the support of the program’s written evaluation of the quality of the applicant’s transcript record.

Satisfaction of minimum entrance requirements does not guarantee admission, since the number of qualified applicants far exceeds the number of places available. As a consequence, many well-qualified applicants may not be accommodated.

Please note that academic performance is not the sole criterion for admission to the university. The university may evaluate a person’s behavior and background to determine their ability to maintain the standards of academic and professional conduct expected at the university. An evaluation may take into consideration current behavior and performance as well as past experiences and actions.

Policy Regarding Students’ Eligibility to Return to Prior College

Applicants who disclose that they are ineligible to re-enroll at any college or university that they attended within the last seven years for student conduct reasons will be automatically declined admission to OSU. Applicants who disclose that the reason for their ineligibility is for academic reasons will be admitted only if they meet OSU’s minimum academic requirements.

All applicants who are denied admission for conduct reasons have the right to appeal that decision, and appeals will be reviewed on a case-by-case basis.

Application Process

Application forms (https://oregonstate.Force.com/AppLogin/) required for admission to the Graduate School are available electronically.

The applicant’s proposed academic program will examine material submitted to determine the adequacy of scholastic background and to decide whether departmental facilities are adequate for the expressed aims of the applicant. Upon the positive recommendation of the academic program, the Graduate School will determine whether minimum university requirements for admission have been met and, subsequently, will provide to the applicant formal notification as to the action taken.

Applicants must upload application materials, unless a program specifies differently. Applicants should contact their academic program(s) of interest to determine whether additional admission materials are required beyond those listed below. Applicants seeking admission to only a graduate certificate program must provide items a., b., and c. below and contact their academic programs to determine what other program-specific materials may be required for admission to the graduate certificate program.

1. One electronic version of the graduate application for each major to which the applicant seeks admission.
2. $75 nonrefundable application fee (domestic students); $85 nonrefundable fee (international students). Applying online requires payment by credit card.
3. Transcripts/Academic Records of all previous academic work, undergraduate and graduate. International applicants must provide a certified English translation of academic records in addition to original language records.

Unofficial records but not grade slips/reports, computer printouts, or internal transcripts may be submitted for evaluation and admission purposes.

If admitted, before registering for courses:

a. Applicants from U.S. schools must provide official transcripts from all colleges attended, including final transcripts showing degrees awarded and dates earned.

b. International applicants must provide equivalent documentation from all colleges attended, including final academic records showing degrees awarded and dates earned in the original language plus certified English translations.

4. Three letters of professional reference are required of most applicants applying for admission to a graduate degree program. Applicants with master’s degrees should include a letter from their major professor. Applicants applying only to graduate certificate programs are encouraged to consult with their academic program to determine whether this or other materials are required.

5. Certain graduate programs require the GRE of all applicants. Address inquiries regarding GRE requirements to your proposed academic program. See specific program information. (http://gradschool.oregonstate.edu/programs/)

International applicants must also upload the following documents with their application materials:

1. One photocopy of TOEFL or IELTS scores. If admitted, official test scores must be received by the Graduate School prior to the start of the applicant’s first term of enrollment.

2. Certification of Finances form with supporting documentation, demonstrating sufficient financial resources for the desired academic program.

Financial documentation is not required at the time of application. If the application is accepted, the Graduate School will contact the applicant via email to request the financial materials.

Note: Applicants taking courses as a distance student through OSU Ecampus and not entering the U.S. must complete a special certification form. Proof of funding is not required. Please contact graduate admissions to request the form.
Application Deadlines

Department Deadlines

Academic programs establish their own application deadlines, which are often substantially earlier than the general university deadlines described below. In such cases, program deadlines supersede the more general university deadline. Many academic programs also admit applicants for specific terms only (e.g., fall term). Applicants should contact the proposed graduate program for deadlines and any other restrictions. See specific program information. (http://gradschool.oregonstate.edu/programs/)

In the absence of earlier program deadlines, the following university deadlines exist:

**U.S. Citizens and Permanent Residents**

Absolutely no later than 30 days prior to the first day of classes.

**International Applicants**

To allow adequate time for students to obtain visas and make travel arrangements, the following deadlines have been established for international applicants:

<table>
<thead>
<tr>
<th>Term</th>
<th>General University Deadline for International Students Applying from Outside the U.S.</th>
<th>General University Deadline for International Students Applying from Within the U.S.</th>
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</thead>
<tbody>
<tr>
<td>Fall</td>
<td>April 1</td>
<td>June 1</td>
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<td>Winter</td>
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<td>Summer</td>
<td>January 1</td>
<td>March 1</td>
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</tbody>
</table>

1 Program deadlines supersede this deadline. Please contact program directly for specific program deadline.

**Summer Session Admission**

See Summer Session (https://summer.oregonstate.edu/)

**Admission Status**

Students may be admitted to the Graduate School under the following categories.

**Advanced-Degree Students**

1. **Regularly Admitted Graduate Students.** These students have been accepted by the university and by a major program to work toward an advanced degree.

2. **Conditionally Admitted Graduate Students.** Students who have not met the formal admission requirements but whose accomplishments have convinced the University Graduate Admissions Committee and their major program that they have potential for success as advanced degree candidates may be conditionally admitted as follows:
   a. Students from nonaccredited institutions must complete at least one term of satisfactory work at Oregon State, after which they may be admitted with full standing in the Graduate School.
   b. Students whose preparation does not warrant full admission to the Graduate School but who may prove acceptable later must satisfactorily complete specified conditions to demonstrate their ability to carry out graduate-level work.

3. **Transitionally Admitted Graduate Students.** International students who lack minimum English language proficiencies but otherwise meet all other formal admission requirements may be transitionally admitted under the following:
   a. TOEFL total score is in the range of 61 to 79 (iBT).
   b. IELTS total score is 6.0.

   Students who score below the minimum on one or more iBT subtests but meet the minimum overall iBT score requirement may be considered for transitional admission. Transitional admission based on English language proficiency may not be granted to students seeking admission to only a graduate certificate program.

4. **Provitionally Admitted Graduate Students.** Students who have met all of the university standards for formal admission but whose academic program or major department may have placed additional restrictions upon their admission may be provisionally admitted. These restrictions may include certain prerequisite courses that must be completed, completion of the GRE or GMAT, submission of additional reference letters or scores, etc.

Conditionally and transitionally admitted students cannot schedule and hold preliminary oral exams or final oral exams for their degree until they have satisfied the requirements of their admission and have been reclassified as regular graduate students.

Provisionally admitted students cannot take the final exam for their degree until they have satisfied their provisions and have been reclassified as regular graduate students.

Credit for graduate courses that students have completed acceptably while registered as conditional, transitional or provisionally students may count toward the residence requirement for advanced degrees.

If students fail to satisfactorily complete their conditions or provisions, they will be dismissed from the Graduate School.

**Graduate Certificate Students**

Students admitted to only a graduate certificate program may be considered for reclassification as degree-seeking graduate students by following the procedure in the section below regarding reclassification.

**Nondegree-Seeking Graduate Students**

The nondegree-seeking graduate student category may be used by holders of a baccalaureate degree who do not wish to pursue an advanced degree or graduate certificate. Those nondegree-seeking graduate students who wish to be reclassified as degree-seeking graduate students must follow the procedure in the next section.

International students who are currently in the U.S. on visas such as an F-1, F-2, B-2, J-1, etc. should consult with OSU’s Office of International Services (http://international.oregonstate.edu/ois/) (OIS) (email: ois.student@oregonstate.edu) before submitting the OSU non-degree application for admission. Only certain visa types allow an individual to pursue part-time or non-degree-seeking course work and still maintain one’s visa status.

Graduate international students who wish to enroll as nondegree students with OSU for one or more terms, but who will not participate in an established exchange program, should contact the OIS Office isas.advisor@oregonstate.edu for further information before applying.
International students who plan to enroll with OSU as nondegree exchange students should use the application form that is made available at each partner institution. Find a list of exchange partner institutions. (https://international.oregonstate.edu/sites/international.oregonstate.edu/files/atosu/osu-exchange-partner-institutions.pdf)

Reclassification of Postbaccalaureate Students, Nondegree-Seeking Students, and Graduate Certificate Students

A postbaccalaureate, nondegree-seeking graduate, or graduate certificate student may be considered for status as a regular degree-seeking graduate student under one of the following provisions, depending upon prior academic records:

If the student would have been eligible for graduate admission at the time of entering as a postbaccalaureate, nondegree-seeking graduate, or graduate certificate student, the student is eligible for admission consideration at any time but must submit an application for admission to the appropriate level to begin the process.

If the student, prior to entering as a postbaccalaureate, nondegree-seeking graduate, or graduate certificate student had been denied graduate admission or would have been ineligible for graduate admission, as determined a posteriori by the University Graduate Admissions Committee, the postbaccalaureate, nondegree-seeking graduate, or graduate certificate student must complete option a, b, or c below and reapply or reactivate an application for admission to graduate-level study:

1. complete 24 credits of courses each with a grade of B (3.00) or better, or
2. complete 15 credits of graduate course work involving lecture and textbook instruction, each eligible to transfer into the degree program and with a grade of B (3.00) or better, or
3. complete sufficient credits to bring the cumulative grade-point average (that for the last 90 credits of undergraduate work plus that for courses taken as part of a or b above) to 3.00 or better before being eligible to apply for graduate admission.

These courses will normally be regular graduate courses relevant to the specific field, except that seminars and other blanket number graduate courses may not be used. Upper-division undergraduate courses are acceptable, provided that they eliminate specific deficiencies in requirements for entry into an identified graduate program. Lower-division undergraduate courses may not be used. All courses should be carefully selected in consultation with an academic advisor from the graduate field into which the student desires admission.

Completion of 2(a), 2(b) or 2(c) above does not guarantee graduate admission. Reclassification decisions employ the same procedures and requirements as those for admission. Postbaccalaureate, nondegree-seeking graduate, and graduate certificate students who seek reclassification must be acceptable to the program in which they plan to major; admission is competitive. The university does not have the capacity to accommodate all who meet the minimum requirements for regular graduate student status; when selecting among students who meet minimum requirements, the university treats students requesting reclassification the same as those applying for admission as regular graduate students.

A postbaccalaureate or nondegree-seeking graduate student may use graduate credit earned in this status toward an advanced degree or graduate certificate if the student is later reclassified as a regular graduate student. This credit cannot be used to satisfy residence requirements for an advanced degree. A graduate certificate student may use graduate credit earned in this status toward an advanced degree if the student is later reclassified as a regular graduate student. In either case, the amount of usable credit will depend on the size of the individual student’s program (e.g., a maximum of 15 graduate credits could be used on a 45-credit master’s program or a maximum of 6 graduate credits may be applied toward an 18-credit graduate certificate.) See section entitled ‘Transfer Credit’ for complete details.

Students should initiate all requests for reclassification at the Graduate School.

Second OSU Master’s Degree

A candidate for a second master’s degree from Oregon State University may request the application of up to 15 credits, appropriate to both programs, from the first master’s degree program to another, subject to the following three requirements:

1. Credits used to satisfy the residency requirements of one master’s degree may not be used to satisfy the residency requirements of another master’s degree.
2. Students who earn two master’s degrees at Oregon State University must complete all degree requirements for each degree. This requires filing separate programs of study forms for each degree, filing separate commencement applications for each degree, completing separate projects or theses for each degree, scheduling separate final oral examinations for each degree, and passing final oral examinations for each degree.
3. Such credit will be granted only for graded course work earned at Oregon State University and completed with a grade of C or higher.

Pursuit of the Second Ph.D.

The doctor of philosophy degree is the highest academic degree granted by North American universities. It is a research degree designed to prepare a student to become a scholar; that is, to discover, integrate, and apply knowledge, as well as communicate and disseminate it. The doctor of philosophy degree is to be distinguished from other doctorates such as the MD, JD, or EdD degrees, which are designed for professional training or which focus on applied rather than basic research.

Students may enroll for a second Ph.D. degree if they have previously obtained a Ph.D. from OSU or elsewhere. Concurrent pursuit of dual Ph.D. degrees is not allowed. In the case of a student pursuing a second Ph.D. degree, requirements for the second Ph.D. must be met without overlap with the first Ph.D. degree including, but not limited to: successful completion of a second preliminary exam; a separate thesis with no overlap with the first Ph.D. thesis, a final defense exam for the second Ph.D.; a different major advisor from the first Ph.D., a thesis committee of different faculty than the first Ph.D. degree (although some, but not complete, overlap between committee members would be acceptable in the case of two Ph.D. degrees from OSU), and all other requirements for the second Ph.D. degree program. Courses from the first Ph.D. degree relevant to the second degree may be allowed to transfer between the two degrees. However, the student’s program of study committee must approve all course transfers, should pay particular attention to the relevancy, overlap, and currency of any courses to be transferred from one
Ph.D. degree to another, and are advised to proceed conservatively when approving course transfers from a first Ph.D. to a second Ph.D. degree.

Re-Enrollment

All credential-seeking graduate students will be subject to the continuous enrollment policy. Continuous graduate enrollment refers to the policy of requiring continuous registration of graduate students from original matriculation until all graduate degree requirements are met. Please refer to Registration Requirements under Policies Governing All Graduate Programs for complete details.

A graduate student who takes an unauthorized break in registration by failing to maintain continuous enrollment or by failing to obtain regular or planned leave of absence will relinquish graduate standing in the university. Students who wish to have their graduate standing reinstated will be required to file an application for graduate admission and pay the application fee. Readmission is not guaranteed even if the student left in good standing.

International students who wish to re-enroll after an absence should contact the Office of International Services (OIS) to make sure they have the required documents to return to the US.

International Admissions

International Undergraduates as Nondegree Students

International students who are currently in the U.S. on visas such as an F-1, F-2, B-2, J-1, etc. and do not have a valid immigration document from OSU should consult with OSU's Office of International Services (OIS) (email: OIS.Student@oregonstate.edu) before submitting the OSU non-degree application for admission. Students will be required to turn in copies of their immigration documents to move forward. Only certain visa types allow an individual to pursue part-time or non-degree-seeking course work and still maintain one’s visa status.

International students who plan to enroll with OSU as non-degree exchange students should use the application form that is made available at each partner institution.

Undergraduate students who wish to enroll with OSU for one or more terms, but who do not plan to complete degree requirements at OSU and will not participate in an established exchange program, should contact International Admissions at intladmit@oregonstate.edu for further information, and before applying.

International students who wish to enroll in Academic English, Undergraduate Pathway, Undergraduate Transfer Program or Graduate Pathway programs should contact INTO Oregon State University at intladmit@oregonstate.edu for further information.

Admission of International Undergraduate Students

International students are admitted to OSU based on meeting the minimum OSU academic requirements, English language proficiency requirements and evidence of funding requirements (if an F-1 or J-1 visa is needed). Visit the Office of International Admissions website (https://admissions.oregonstate.edu/international/).

In general, international applicants must have completed their high school diploma or secondary school certificate with a minimum 3.0 on a 4.0 scale, an average ‘B’ grade (A–F), or the equivalent.

Applicants transferring from a recognized college or university outside the U.S. must have a cumulative grade-point average of 2.25, meet OSU's math requirement for transfer students (if you have earned 24 or more transferrable quarter credits) and be eligible to return to the most recent institution attended.

Applicants transferring from a regionally accredited college or university in the U.S. must have a cumulative grade-point average of 2.25, meet OSU's math and writing requirements for transfer students (if you have earned 24 or more transferrable quarter credits), and be eligible to return to the most recent institution attended.

Applicants for a bachelor's degree must submit official records of all secondary, middle and high schools attended (in general, these represent years 9–12) and all colleges, universities and/or professional schools attended. Results of comprehensive examinations are required in the original language and on the official form of the institution, government, or other examining or certifying agency.

Applicants must present proof of English language proficiency, if available, by submitting TOEFL, IELTS or an acceptable alternative, e.g., IGCSE, SAT, ACT, or AP results.

Exceptions to the English proficiency test requirement are:

- Individuals who have completed a bachelor's degree from a regionally accredited institution in the U.S. or other English speaking country (See list below).
- Citizens of the following countries: Anguilla, Antigua and Barbuda, Australia, Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Canada (English speaking provinces), Cayman Islands, Dominica, Grenada, Ireland, Jamaica, Montserrat, New Zealand, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos, United Kingdom, U.S. Virgin Islands.
- For citizens of African countries whose official language is English, waivers will be considered on a case-by-case basis if the medium of instruction is English.

INTO OSU Pathway Programs

UNDERGRADUATE PATHWAY

INTO Oregon State University's Undergraduate Pathway programs combine intensive language study, academic skills development and academic course work in a carefully constructed program designed to move students successfully through one to three terms of undergraduate study in their degree program. Entry requirements vary based on the length of program chosen. All students have a study plan and receive academic advising that is reflective of their specific Undergraduate Pathway program.

Successful completion of Undergraduate Pathway progression requirements allows students to complete one to three terms of undergraduate study and progress to their undergraduate degree at Oregon State University in their respective field of study.

Academic English + Undergraduate Pathway

Academically qualified applicants for Undergraduate Pathway who are unable to provide a language proficiency score (or who provide one that is below the minimum) will begin their program by taking Academic English courses until they complete Level 4 of the program. All students...
have a study plan and receive academic advising that is reflective of the Academic English + Undergraduate Pathway program.

**GRADUATE PATHWAY**

INTO Oregon State University’s Graduate Pathway program provides international students a direct path to various graduate degrees at the university. The program gives students the academic foundation and essential language skills to successfully move on to the Master’s degree. Entry to this program requires satisfactory completion of a four-year undergraduate degree in an appropriate subject with at least a 2.5 GPA or equivalent overall 70 iBT TOEFL or equivalent test score (some options have higher entry requirements). All students have a study plan and receive academic advising that is reflective of their specific Graduate Pathway program.

Successful completion of Graduate Pathway progression requirements secures students a place in full-time graduate studies at Oregon State University in their respective field of study.

**Academic English + Graduate Pathway**

Academically qualified applicants for Graduate Pathway who are unable to provide a language proficiency score (or who provide one that is below the minimum) will begin their program by taking Academic English courses until they complete Level 5 of the program. All students have a study plan and receive academic advising that is reflective of the Academic English + Graduate Pathway program.

**WHEN TO APPLY: INTERNATIONAL UNDERGRADUATE STUDENTS**

The Office of International Admissions recommends that international undergraduate applicants submit a complete application and supporting documents preferably 4 to 6 months before the intended term start date.

For information about Admission of International Graduate Students, please see the Graduate Admissions Requirements (p. 36) section.

**Oregon Transfer Module**

The Oregon Transfer Module (OTM) provides a one-year curriculum for students who plan to transfer to a state of Oregon two-year or four-year college/university of higher education. The Oregon Transfer Module is neither a certificate nor a degree; it represents the successful completion of certain general education courses. OTM completion will be noted in the student’s record. The Oregon Transfer Module documents that a student has met a subset of the common general education requirements at all Oregon community colleges and state universities in Oregon.

The Oregon Transfer Module requirements at Oregon State University are:

- 45 lower-division credits—minimum of 12 credits must be OSU course work according to the attached list
- Minimum grade of C– for each course
- Minimum cumulative GPA 2.0 at time Oregon Transfer Module is completed
- Students are allowed 3 S/U credits per full time term or a maximum of 9 S/U credits in the Oregon Transfer Module.

OSU students planning to complete the Oregon Transfer Module must file the OTM Completion Application with the Registrar’s Office. Students should fill out the form when the module is completed or they are in the last term of completion.

Upon successful review by OSU and completion of the Oregon Transfer Module, a notation will be added to the student’s OSU record indicating the module is complete and the date. The notation will appear on the transcript as follows:

'Oregon Transfer Module Completed day-month-year'

### Oregon Transfer Module Courses

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<tr>
<th>Code</th>
<th>Foundation Skills</th>
<th>Hours</th>
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<tbody>
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<td>PHL 121</td>
<td>*REASONING AND WRITING</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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<td>WR 214</td>
<td>*WRITING IN BUSINESS</td>
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<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>WR 224</td>
<td>*INTRODUCTION TO FICTION WRITING</td>
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<tr>
<td>WR 241</td>
<td>*INTRODUCTION TO POETRY WRITING</td>
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</table>

**Writing**

**Oral Communication**

Select two of the following:

- COMM 111 *PUBLIC SPEAKING
- COMM 114 *ARGUMENT AND CRITICAL DISCOURSE
- COMM 114H *ARGUMENT AND CRITICAL DISCOURSE
- COMM 218 *INTERPERSONAL COMMUNICATION

**Mathematics**

Select one of the following:

- MTH 105 *INTRODUCTION TO CONTEMPORARY MATHEMATICS
- MTH 111 *COLLEGE ALGEBRA
- MTH 112 *ELEMENTARY FUNCTIONS
- MTH 211 *FOUNDATIONS OF ELEMENTARY MATHEMATICS
- MTH 241 *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE
- MTH 245 *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES
- MTH 251 *DIFFERENTIAL CALCULUS
- MTH 251H *DIFFERENTIAL CALCULUS

**Introduction to Disciplines**

**Arts and Letters**

Select a minimum of three courses of the following:

- ART 101 *INTRODUCTION TO THE VISUAL ARTS
- ART 204 *INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES
- ART 205 *INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE
- ART 206 *INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY
- ENG 104 *INTRODUCTION TO LITERATURE: FICTION
- ENG 104H *INTRODUCTION TO LITERATURE: FICTION
- ENG 105 *INTRODUCTION TO LITERATURE: DRAMA
- ENG 106 *INTRODUCTION TO LITERATURE: POETRY
- ENG 201 *SHAKESPEARE
- ENG 202 *SHAKESPEARE
- ENG 204 *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660
- ENG 205 *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA
- ENG 206 *SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY
- ENG 207 *LITERATURE OF WESTERN CIVILIZATION: CLASSICAL-Renaissance
- ENG 208 *LITERATURE OF WESTERN CIVILIZATION: 18TH CENTURY TO PRESENT
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<td>ENG 211</td>
<td>LITERATURES OF THE WORLD: AFRICA</td>
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<tr>
<td>ENG 212</td>
<td>LITERATURES OF THE WORLD: MESO/SOUTH AMERICA, CARIBBEAN</td>
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<td>ENG 213</td>
<td>LITERATURES OF THE WORLD: MIDDLE EAST</td>
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<td>ENG 215</td>
<td>CLASSICAL MYTHOLOGY</td>
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<td>ENG 221</td>
<td>AFRICAN-AMERICAN LITERATURE</td>
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<td>ENG 253</td>
<td>SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
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<td>ENG 254</td>
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<td>ENG 260</td>
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<td>ENG 275</td>
<td>THE BIBLE AS LITERATURE</td>
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<td>FILM 110</td>
<td>INTRODUCTION TO FILM STUDIES: 1895-1945</td>
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<td>FILM 125</td>
<td>INTRODUCTION TO FILM STUDIES: 1945-PRESENT</td>
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<td>FILM 220</td>
<td>TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION</td>
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<td>FILM 245</td>
<td>THE NEW AMERICAN CINEMA</td>
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<td>FILM 265</td>
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<td>MUS 101</td>
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<td>MUS 102</td>
<td>MUSIC APPRECIATION II: PERIODS AND GENRES</td>
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<td>MUS 103</td>
<td>MUSIC APPRECIATION III: GREAT COMPOSERS</td>
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<td>MUS 108</td>
<td>MUSIC CULTURES OF THE WORLD</td>
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<td>TA 147</td>
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<td>WLC 230</td>
<td>FRANCE TODAY: CULTURES WITHIN AND BEYOND ITS BORDERS</td>
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Social Sciences

Select a minimum of three courses of the following: 9

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<td>AEC 250</td>
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<td>AEC 253</td>
<td>ENVIRONMENTAL LAW, POLICY, AND ECONOMICS</td>
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<td>LATINO/A IDENTITIES AND ACTIVISM</td>
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<td>PHL 220</td>
<td>WORLD-VIEWS AND VALUES IN THE BIBLE</td>
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<td>PHL 251</td>
<td>KNOWERS, KNOWING, AND THE KNOWN</td>
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<td>PHL 280</td>
<td>ETHICS OF DIVERSITY</td>
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<tr>
<td>PS 201</td>
<td>INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
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<tr>
<td>PS 204</td>
<td>INTRODUCTION TO COMPARATIVE POLITICS</td>
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<td>PS 205</td>
<td>INTRODUCTION TO INTERNATIONAL RELATIONS</td>
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<td>PS 206</td>
<td>INTRODUCTION TO POLITICAL THOUGHT</td>
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<td>PSY 201</td>
<td>GENERAL PSYCHOLOGY</td>
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<td>PSY 202</td>
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<tr>
<td>SOC 204</td>
<td>INTRODUCTION TO SOCIOLOGY</td>
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<td>SOC 205</td>
<td>INSTITUTIONS AND SOCIAL CHANGE</td>
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<td>SOC 206</td>
<td>SOCIAL PROBLEMS AND ISSUES</td>
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<tr>
<td>WGS 223</td>
<td>INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
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<tr>
<td>WGS 223H</td>
<td>INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
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<tr>
<td>WGS 224</td>
<td>WOMEN: PERSONAL AND SOCIAL CHANGE</td>
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<tr>
<td>WGS 280</td>
<td>WOMEN WORLDWIDE</td>
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</table>

Science/Math/Computer Science

Select three of the following, including at least one biological or physical science with a laboratory: 12

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ANS 121</td>
<td>INTRODUCTION TO ANIMAL SCIENCES</td>
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<tr>
<td>BI 101</td>
<td>ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE</td>
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<tr>
<td>BI 102</td>
<td>ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE</td>
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<tr>
<td>BI 103</td>
<td>HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE</td>
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<td>BI 211</td>
<td>PRINCIPLES OF BIOLOGY</td>
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<td>BI 211H</td>
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<td>BI 212</td>
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<td>BOT 101</td>
<td>BOTANY: A HUMAN CONCERN</td>
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<td>CH 122</td>
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<td>CH 123</td>
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<td>CH 231</td>
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<td>CH 233</td>
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<td>CSS 205</td>
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<td>SOIL SCIENCE</td>
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<td>FES 240</td>
<td>FOREST BIOLOGY</td>
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<td>GEO 101</td>
<td>THE SOLID EARTH</td>
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<td>GED 201</td>
<td>PHYSICAL GEOLOGY</td>
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<td>GED 202</td>
<td>EARTH SYSTEMS SCIENCE</td>
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<td>GED 203</td>
<td>EVOLUTION OF PLANET EARTH</td>
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<td>MB 230</td>
<td>INTRODUCTORY MICROBIOLOGY</td>
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<td>OC 103</td>
<td>EXPLORING THE DEEP GEOGRAPHY OF THE WORLD'S OCEANS</td>
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<td>PH 104</td>
<td>DESCRIPTIVE ASTRONOMY</td>
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<td>PH 106</td>
<td>PERSPECTIVES IN PHYSICS</td>
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<td>PH 213</td>
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**Electives**

Select one additional course as required to bring the total to 45

| Total Hours | 45-46 |
---|---|

\(^1\) The course may be from any of the Introduction to Disciplines areas (Arts and Letters, Social Science, or Science/Math/Computer Science).

* Baccalaureate Core Course (BCC)
College of Agricultural Sciences

The college connects people and the environment, helping communities and industries thrive by finding real-world solutions that are both economically and ecologically sustainable. With over 2600 students, 250 professorial faculty, $500,000 in scholarships, and $90 million in research grants and contracts, AgSci is integral to OSU’s standing as a top-tier land-grant university and its international ranking for agriculture and forestry.

147 Strand Agricultural Hall
Oregon State University
Corvallis, OR 97331-2202
541-737-2211
Email: casstudy@oregonstate.edu
Website: http://agsci.oregonstate.edu/
Facebook: @OSUAgSci (https://www.facebook.com/OSUAgSci/)
Twitter: @OSUAgSci (https://twitter.com/OSUAgSci/)

Administration

Alan Sams, Dean, 541-737-2331, alan.sams@oregonstate.edu
William G. Boggess, Executive Associate Dean, 541-737-2331, bill.boggess@oregonstate.edu
Joyce Loper, Associate Dean, 541-737-2331, joyce.loper@oregonstate.edu
W. Dan Edge, Associate Dean, 541-737-2910, daniel.edge@oregonstate.edu
Sam Angima, Assistant Dean of Outreach and Engagement, 541-737-3742, sam.angima@oregonstate.edu
Penelope Diebel, Assistant Dean of Academic Programs, 541-737-5317, penelope.diebel@oregonstate.edu
John Talbott, Assistant Director, Oregon Agricultural Experiment Station, 541-737-2194, john.talbott@oregonstate.edu
Christina Walsh, Student Engagement coordinator, 541-737-2580, christina.walsh@oregonstate.edu
Paul Dorres, Manager of Student Information, Scholarships, and Education Abroad, 541-737-5655, paul.dorres@oregonstate.edu
Michelle McAllaster, Head Advisor, 541-737-5816, michelle.mcallaster@oregonstate.edu

College of Agricultural Sciences (AgSci)

Academics within the College of Agricultural Sciences prepare the next generation of scientists, managers, and leaders in the fields of food, agriculture, natural resources, and life sciences. With 14 academic programs, learning is integrated with research and Extension to provide students with inquiry-based, hands-on experiences in laboratories and field locations across Oregon and the world.

Individualized Advising

Each student is considered an important individual. A student’s study program is developed in personal consultation with an advisor in the department of their major interest. A student’s advisor is the primary resource for advising, obtaining information about registration, and gaining signatures and support for petitions and forms. They are a student’s link to campus support resources, and can help with other advising issues including professional development, leadership opportunities, experiential learning and career based topics or questions. Advisors know how to find help for almost any issue—they are a great place to start when students feel lost.

As early as possible, each student is encouraged to select a subject area and become associated with instructors and other students with similar interests. Initial or early advising is based upon the student’s high school record and placement test scores. When high school preparation is found to be inadequate, the student is encouraged to enroll in courses providing the education, training, and experience necessary to help ensure success at the university level, even though such work may require the student to take one or more additional terms to complete a prescribed four-year curriculum. Students planning to transfer from a community college or another four-year institution are encouraged to contact an advisor to discuss their plan of study as far in advance of transferring as possible.

Opportunities

Internships

College of Agricultural Sciences departments offer academic credit for on-the-job learning experiences that connect to student learning objectives. Internships are available (https://agsci.oregonstate.edu/academic-programs/opportunities/internships/) in all facets of agriculture and can be paid, unpaid, local, national or international. Details regarding specific departmental requirements are available from departmental advisors. Industries, agencies and students interested in general internship information should contact the Academic Programs Office (https://agsci.oregonstate.edu/academic-programs/contact/).

Scholarships

The College of Agricultural Sciences offers a variety of scholarships. Several are reserved for incoming high school or transfer students, and are included in the admissions process (http://admissions.oregonstate.edu/apply-choose-application/). Additional information and application forms for college-level scholarships can be found here (https://agsci.oregonstate.edu/academic-programs/scholarships/). For information about departmental scholarships, contact each department directly (https://agsci.oregonstate.edu/main/operating-units/). For more information about university-level scholarships, contact the Scholarships Office (http://scholarships.oregonstate.edu/).

Global

The College of Agricultural Sciences has International Exchange Agreements (https://international.oregonstate.edu/agreements/list/) with numerous institutions spanning thirteen countries. Students may choose to study abroad via the exchange program with Lincoln University in New Zealand; learn about various regions across the globe by participating in the Exploring World Agriculture class and companion Faculty-led Educational Tour; or encounter cultures and traditions through their peers in the International Agriculture Club.
Research
The College of Agricultural Sciences provides multiple pathways for students to apply their knowledge through research (https://agsci.oregonstate.edu/academic-programs/opportunities/undergraduate-research/). Whether you are just starting out, or ready to begin an independent research project (https://agsci.oregonstate.edu/academic-programs/agsci-all-star-ananiya/), we have mentors and funding to help you gain research experience.

Undergraduate Minor Programs
Minors (https://agsci.oregonstate.edu/academic-programs/undergraduate-degrees/#minor) are offered through most departments of the College of Agricultural Sciences. Students interested in pursuing a minor must first contact the key advisor (https://agsci.oregonstate.edu/academic-programs/about/advisors/) in the area of interest. The minor must consist of a minimum of 27 designated credits of related course work, including at least 12 in upper-division courses.

Graduate Programs
Take your education to the next level with one of our advanced degrees, or broaden your skill-set by completing a graduate certificate. The College of Agricultural Sciences offers a variety of graduate studies (https://agsci.oregonstate.edu/academic-programs/graduate-degrees/) both on-campus and online. Our graduate student body includes ARCŞ® Foundation Scholars, Fulbright Fellows and Fellows supported by NOAA and other organizations or federal agencies. Funding opportunities are available through graduate teaching and research assistant positions. Graduate program requirements, deadlines, and application processes can be found on the Graduate School website (https://gradschool.oregonstate.edu/).

Graduation Requirements
To be eligible for a bachelor of science (BS) degree, a student must complete a minimum of 180 credits including:

1. University Baccalaureate Core requirements
2. Courses in agricultural sciences: 36 credits including 24 credits at the upper-division level.

Agricultural Education and General Agriculture
The Department of Agricultural Education and General Agriculture combines two programs: Agricultural Sciences and Agricultural Education.

The Agricultural Sciences Program is an undergraduate studies program that provides maximum flexibility in designing and structuring a course of study to meet the students’ individual needs. Agricultural Sciences should be seriously considered by students desiring programs of study not currently available in any other agricultural subject matter department (such as those involving a minor in communications, recreation, or environmental studies in agriculture); students wishing to pursue two or more areas of specialization (such as students who are returning to farms or ranches and who need substantial background, for example, in animal science, crops, and agricultural business management); students preparing for leadership positions in agriculture that require excellent communication and leadership skills as well as breadth of agricultural background (such as agriculture teachers, lobbyists, commodity liaison persons or extension staff); or students who have not selected a departmental major in the College of Agricultural Sciences but who know they are interested in an agricultural career.

The goal of the Agricultural Sciences Program is to help students identify the agricultural career in which they are most interested and build a course of study that will qualify each student for their chosen profession. Advising is of paramount importance in this process and major emphasis is placed on career advising.

The Agricultural Education Program offers course work serving teachers and leaders in agriculture. The MS and MAIS degrees may be pursued with an emphasis in leadership, communication, pedagogy, extension and/or technical agriculture. Candidates work with an advisor to develop programs that meet their specific needs as indicated by their occupational objectives. The Agricultural Education MS degree aligns with an initial teaching license in Oregon.

Three undergraduate minors are available in the Department of Agricultural Education and General Agriculture.

1. The Agricultural Sciences minor is available for undergraduate students who have majored in an area that requires the addition of breadth in agriculture to their major program. The minor provides the appropriate technical agriculture background for students interested in agricultural management, communication, environmental studies, etc.
2. The Comparative International Agriculture minor provides students with formal instruction in international agricultural concepts and practical experiences through global awareness course work, language immersion via study/research abroad, and/or international fieldwork. The 27-credit curriculum prepares students for successful postbaccalaureate international careers, or those seeking graduate studies in international agriculture programs.
3. The Leadership minor is designed for all undergraduates interested in developing premier leadership, enhancing professional competencies, and fostering the skills necessary to meet the local, national, and international needs of our society. The Leadership minor is centered on leadership theory (education), trait/skill development (training), and application (development). It is designed to allow students to apply the course work in a relevant and relational manner. This minor is also available via Ecampus.

Career Opportunities in Agricultural Sciences
Career opportunities for general agriculture majors are unlimited because of the nature of the program structure. Students can return to home farms or ranches, move into agricultural middle management, become extension staff, move into political lobby positions, work in marketing or international agriculture, become high school teachers of agriculture, or teach agriculture in community colleges. Salaries vary depending on the position a student may strive to achieve.

Undergraduate Studies Curriculum
High school and college transfer students who are admitted to Oregon State University as an undergraduate are eligible to participate in the Agricultural Sciences Program. Agricultural Sciences majors, in consultation with their departmental academic advisor, may plan elective course work to emphasize personal interests, abilities, and career objectives. A leadership and communication area of emphasis is available and is specially designed for those students who will need breadth in their technical agriculture background and excellence in
communication and leadership skills. The intent of this area of emphasis within the Agricultural Sciences Program is to prepare agriculture's future leaders in extension, government, and business. A teacher preparation area of emphasis is available and allows for Initial Teacher Licensure within the baccalaureate degree.

Undergraduate Programs

Majors
- Agricultural Sciences (p. 52)

Minors
- Agricultural Sciences (p. 51)
- Agricultural Sciences and Natural Resources Communications (p. 51)
- Comparative International Agriculture (p. 53)
- Leadership (p. 54)

Graduate Programs

Majors
- Agricultural Education (p. 50)

Minors
- Agricultural Education (p. 51)

Agricultural Education

AED 235. INTRODUCTION TO AGRICULTURAL EDUCATION. (2 Credits)
Introduces students to the field of agricultural education. Explore the historical foundations and career pathways in non-formal and school-based agricultural education. Topics will include school-based agricultural education, non-formal and extension education, and agricultural literacy. Develop career skills and a plan to pursue a future career in agricultural education.

AED 313. THEORY AND PRACTICUM III: FIELD. (4 Credits)
Field based experience for students preparing to be agricultural teachers. Focus on teaching models.

AED 325. PLANNING AND DELIVERING NON-FORMAL AGRICULTURAL EDUCATION. (3 Credits)
This course uses adult learning theory and practice, including planning non-formal agricultural education programs for youth and adults, methods of instructional delivery, effective use of instructional technology, marketing agricultural education programs, and evaluation of agricultural education outcomes. Microteaching (practice teaching presentations) and group presentations required as part of laboratory assignments.

AED 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

AED 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AED 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

AED 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

AED 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

AED 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

AED 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

AED 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

AED 510. PROFESSIONAL INTERNSHIP: AGRICULTURE EDUCATION. (1-40 Credits)
A field experience in which the intern will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples.

AED 518. EXTENSION COURSE IN TEACHER EDUCATION/PEDAGOGY. (1-3 Credits)
Enables present and prospective teachers of agriculture to continue their professional development on pedagogical topics of current importance. (This course is limited to 9 credits per term.)
Equivalent to: AG 518
This course is repeatable for 50 credits.

AED 533. RURAL SURVEY METHODS. (3 Credits)
Technique, analyzing, interpreting, and using results of survey data; identifying and utilizing community resources; develop and organize agriculture programs to meet community needs.

AED 552. PROGRAM ORGANIZATION AND MANAGEMENT. (3 Credits)
Explores the foundations of vocational education, essential learning skills, advisory committees, and development of a vocational education philosophy. Students will study the elements of educational reform as they apply to specific service areas. Resource analysis, student organizations, and school-to-work transitions will also be studied.

AED 553. APPLIED INSTRUCTIONAL STRATEGIES. (3 Credits)
Helps students in the identification and development of goals, objectives and units. The course includes the development and application of subject area instructional strategies/models, including applied math, writing, communication skills, measurement and evaluation of achievement, and delivery of instruction to at-risk students. Safety is a primary focus.

AED 554. MICRO-TEACHING. (3 Credits)
Planning, presenting and evaluating lessons in a micro-teaching lab. It includes application of content pedagogy strategies, subject matter principles and media technology. Lessons presented on safety.

AED 555. LABORATORY PEDAGOGY. (3 Credits)
Applications of efficient planning, organizing, and teaching skills within the laboratory setting and utilization of laboratory facilities to optimize learning experiences. Laboratory facilities could include a shop, greenhouse, land laboratories/outdoors, agriscience labs, aquaculture, computer lab, field trips, etc.

AED 556. LINK RESEARCH, TEACHING, AND PRACTICE. (3 Credits)
Links research to teaching. Students will work with cooperating teachers to identify and apply research to teaching.

AED 557. ISSUES AND TRENDS IN CURRICULUM AND INSTRUCTION. (3 Credits)
Emphasizes trends related to subject matter curriculum issues unique to agricultural education at the secondary level.
AED 558. IMPROVING AGRICULTURAL SCIENCE AND TECHNOLOGY PROGRAMS. (3 Credits)
Provides impetus toward evaluation and improvement of local programs of agricultural science and technology (AST), such that they better reflect community, regional, and national needs.

AED 580. COMMUNICATING AGRICULTURAL AND LIFE SCIENCES TO THE PUBLIC. (3 Credits)
Focuses on communicating with the public about research-based science in agricultural and life sciences for the purposes of education, influencing public policy, promoting positive agricultural practices and creating change. Explores various communication outlets and media and how they are appropriate for different messages.

AED 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AED 603. DISSERTATION. (1-16 Credits)
Students engage in research and writing related to the completion of their dissertation to fulfill the requirements of the College of Education PhD program.
This course is repeatable for 999 credits.

AED 640. INSTRUMENTATION AND DATA COLLECTION IN SOCIAL SCIENCE. (3 Credits)
Addresses the selection, development, and analysis of various types of quantitative instruments and procedures for collecting research data. The course has a quantitative focus and is oriented toward social science research. Lec/lab.
Recommended: SED 580 or equivalent introductory research methods course.

Agriculture-General

AG 111. INFORMATION TECHNOLOGY IN AGRICULTURE. (3 Credits)
Using information technology in agriculture and agribusiness; practical experience with computer programs applicable to all agricultural disciplines.
Equivalent to: AREC 111

AG 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

AG 200. ORIENTATION TO THE AGRICULTURAL SCIENCES MAJOR. (2 Credits)
Exploration of Agricultural Sciences major and career opportunities.

AG 211. SURVEY AND CONSTRUCTION. (3 Credits)
Land measurement and leveling as applied to agricultural uses. Concrete and agricultural building construction including the use of construction power tools, selection of materials and cost estimating.

AG 221. METALS AND WELDING. (3 Credits)
Practices of metal working including the use of metal working machines, metal identification, heat treating and metal properties. Fabrication of metals including arc and oxy-acetylene welding and cutting. Lec/lab.

AG 230. INTRODUCTION TO EXTENSION AND ENGAGEMENT. (3 Credits)
For students interested in pursuing a career with the OSU Extension Service. An introduction to the OSU Extension Service mission, philosophy, history, organization, structure, administration, program areas, Extension program development, Extension teaching and delivery methods, and the involvement and use of volunteers.
This course is repeatable for 6 credits.

AG 301. *ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS. (3 Credits)
Designed and presented in partnership with Pacific Northwest Indians and Alaska Natives, focusing on natural ecosystems, differing views, power relationships, policymaking, and gender roles. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

AG 311. *NATIVE AMERICAN AGRICULTURE. (3 Credits)
Explores Native North American agriculture and land management—prehistory of important domesticates such as maize, historic change, and contemporary issues including modern stereotypes, women in agriculture, cultural survival, and both the physical and spiritual significance of these crops in Native American communities and around the globe past and present. (Bacc Core Course)
Attributes: CPSC – Core, Pers, Cult Diversity; CPDP – Core, Perspective, Difference/Power/Discrimination

AG 312. ENGINE THEORY AND OPERATION. (3 Credits)
Engine construction, operational theories and principles, lubrication, fuels and oils, emissions and preventive maintenance are taught through the process of small engine lab activities. Engine efficiency theories and measurement are presented.

AG 318. ACCESSING INFORMATION FOR AGRICULTURAL RESEARCH. (1 Credit)
Designed for students at a distance to develop library skills and improve access to information used to conduct technical agricultural research.

AG 351. *COMMUNICATING AGRICULTURE TO THE PUBLIC. (3 Credits)
Students will explore various outlets for communicating with the public about agriculture using appropriate, professional writing. Additionally, students will articulate their thoughts on controversial issues as well as write feature and editorial pieces promoting positive agricultural practices and people in agriculture. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CSGI – Core, Synth, Global Issues

AG 391. FARM IMPLEMENTS. (3 Credits)
Power farming implements including operation, maintenance, adjustments, calibration and use are covered. Field trips may be required.

AG 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

AG 402. INDEPENDENT STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

AG 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

AG 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

AG 406. SPECIAL PROBLEMS. (1-16 Credits)
This course is repeatable for 16 credits.

AG 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

AG 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

AG 410. INTERNSHIP. (1-16 Credits)
A work internship to give students practical on-the-job preparation in any of the main facets of agriculture or related industries.
This course is repeatable for 16 credits.
AG 412. AG SAFETY AND HEALTH. (3 Credits)
An examination of various hazards associated with agriculture. Control strategies will be explored and prevention methods identified. Hazards examined include machinery, livestock, controlled spaces, pesticides, and other items common to the agricultural workplace. Lec/lab.

AG 421. *WRITING IN AGRICULTURE. (3 Credits)
Students will synthesize their knowledge in various areas of agricultural sciences and analyze how current issues impact the agriculture industry, explore careers in agriculture, and develop their written communication skills. Students will share their ideas and demonstrate their learning primarily in writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

AG 425. DEVELOPMENTS IN AGRICULTURAL MECHANICS. (3 Credits)
Emphasis on the development of instructional units for agricultural instruction programs. Wide applications to agricultural mechanization and biotechnology.
This course is repeatable for 9 credits.

AG 435. PROFESSIONAL PRESENTATIONS IN AGRICULTURE. (3 Credits)
Students will learn to effectively create and deliver professional presentations relevant to careers in agriculture and natural resources. This includes developing skills for both formal and informal presentations, using visual aids effectively, and using appropriate strategies to engage various audiences.

AG 445. *SOCIAL MEDIA ADVOCACY IN AGRI SCIENCES & NATURAL RESOURCES. (3 Credits)
Through practice and application, students develop the ability to communicate effectively in writing using social media and other digital platforms for business purposes, including internal communication, stakeholder engagement, educational messaging, event promotion, and product marketing.
Attributes: CSW2 – Core, Skills, WR II

AG 455. *RISK AND CRISIS COMMUNICATIONS IN AG SCI & NATURAL RESOURCES. (3 Credits)
Examine potential risk and crisis communications scenarios in agriculture, natural resources and environmental sciences, plus the relevant theories, models, and processes involved in addressing these types of situations effectively. Explores the mitigation, management, and response to risks and crises from a communications perspective with special application to natural resources, along with agricultural and environmental sciences, hazardous situations through completing case studies and creating a risk and crisis communications manual. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

AG 465. AG SCI AND NATURAL RESOURCES COMMUNICATIONS MINOR CAPSTONE. (2 Credits)
Reflect on accumulated knowledge and technical/soft skills gained and conceptualize how to apply communication theories and practices in the context of future agricultural and natural resources careers. Integrate real-life agriculture and natural resources communications scenarios, which will allow for the practice of strategy development, proper implementation, and appropriate assessment methods. Helps package and demonstrate skills verbally and in a portfolio.
Prerequisites: AG 351 with D- or better

AG 492. TECHNOLOGY TRANSFER IN AGRICULTURE. (3 Credits)
Examination of processes by which formal and informal agricultural instruction programs influence the introduction and acceptance of technology in agriculture. An emphasis in the international arena will be maintained. The focus throughout the course will be on the role of a professional change agent working with technological change.

AG 499. SPECIAL TOPICS. (1-4 Credits)
Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
This course is repeatable for 12 credits.

AG 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

AG 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

AG 518. EXTENSION COURSE IN TEACHER EDUCATION: TECHNICAL. (1-3 Credits)
Enables present and prospective teachers of agriculture to continue their professional development on technical topics of current importance.
Equivalent to: AED 518
This course is repeatable for 9 credits.

AG 521. WRITING IN AGRICULTURE. (3 Credits)
Students will synthesize their knowledge in various areas of agricultural sciences and analyze how current issues impact the agriculture industry, explore careers in agriculture, and develop their written communication skills. Students will share their ideas and demonstrate their learning primarily in writing.

AG 525. DEVELOPMENTS IN AGRICULTURAL MECHANICS. (3 Credits)
Emphasis on the development of instructional units for agricultural instruction programs. Wide applications to agricultural mechanization and biotechnology.
This course is repeatable for 45 credits.

AG 541. COMMUNITY PROGRAMS IN AGRICULTURE. (3 Credits)
Evaluating agricultural education program effectiveness and technical appropriateness. Development of long-range plans for agricultural programs to meet the technical needs of a community.

AG 592. TECHNOLOGY TRANSFER IN AGRICULTURE. (3 Credits)
Examination of processes by which formal and informal agricultural instruction programs influence the introduction and acceptance of technology in agriculture. An emphasis in the international arena will be maintained. The focus throughout the course will be on the role of a professional change agent working with technological change.

AG 808. WORKSHOP. (1-4 Credits)
Designed to enhance professionalism and create a knowledge base to increase personal effectiveness. This course will provide a basis for future leadership by synthesizing theoretical knowledge with practical application. Individuals will have the opportunity to explore their own personality, reflect on their leadership ability, and develop the professional skills and networking abilities necessary to become influential leaders in their home, community and profession.
This course is repeatable for 4 credits.

Leadership

LEAD 242. PERSONAL LEADERSHIP DEVELOPMENT. (3 Credits)
Examines content related to leadership traits, styles, and effective leadership tactics. An introductory course designed to create awareness and develop the employability skills necessary for participants to be productive contributors in their school, home, community and profession.
Equivalent to: AG 242
LEAD 342. TEAM AND ORGANIZATIONAL LEADERSHIP. (3 Credits)
Examines the planning, implementation and evaluation of organizations, and challenges students in the development of effective communication, group dynamics, conflict management, teambuilding and problem solving. Students will be challenged to examine their leadership role in their school, community and profession. 
Equivalent to: AG 342

LEAD 401. LEADERSHIP RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 410. LEADERSHIP INTERNSHIP. (1-16 Credits)
Students apply what they have learned through both the leadership theory and trait/skill development portion of the Leadership minor. This course is repeatable for 16 credits.

LEAD 442. LEADERSHIP SKILLS FOR CAREER SUCCESS. (3 Credits)
Focuses on the development and refinement of the following leadership skills: utilizing diversity, team building, project management, program planning models, working with difficult people, conflict management, leading change, establishing an effective network, organizational strategies, and emotional intelligence. 
Equivalent to: AG 442

LEAD 443. LEADERSHIP THROUGH CONVERSATIONS. (3 Credits)
Engages students in the exploration of conversations as a component of leadership. Students will engage in topics related to developing effective conversations, listening, conversation styles, group dynamics, digital communication, meetings as conversations and interviewing skills. 
Equivalent to: AG 443

LEAD 444. LEADERSHIP MINOR CAPSTONE. (2 Credits)
Capstone course for students completing the Leadership minor. Students will reflect on what they have learned through the Leadership minor and how to apply that learning in the context of their future careers. 
Equivalent to: AG 444
Recommended: (AG 242 or LEAD 242) and (AG 342 or LEAD 342)

LEAD 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 506. SPECIAL PROBLEMS/SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 542. LEADERSHIP SKILLS FOR CAREER SUCCESS. (3 Credits)
Focuses on the development and refinement of the following leadership skills: utilizing diversity, team building, project management, program planning models, working with difficult people, conflict management, leading change, establishing an effective network, organizational strategies, and emotional intelligence. 
Equivalent to: AG 542

LEAD 543. LEADERSHIP THROUGH CONVERSATIONS. (3 Credits)
Engages students in the exploration of conversations as a component of leadership. Students will engage in topics related to developing effective conversations, listening, conversation styles, group dynamics, digital communication, meetings as conversations and interviewing skills. 
Equivalent to: AG 543

LEAD 580. LEADING AUTHENTICALLY: FOUNDATIONS OF LEADERSHIP. (3 Credits)
The foundational course for students in graduate leadership coursework. Students will explore leadership theories to develop an understanding of how to be an authentic leader. Students will analyze and apply course content in relation to their own personal leadership experiences and gain perspectives and tools to influence their future.

LEAD 581. LEADING OTHERS: ENHANCING TEAM AND ORGANIZATIONAL PERFORMANCE. (3 Credits)
A foundational course for group, team, and organizational leadership. Throughout this course, you will become familiar with the necessary conditions for designing effective teams and work groups, best practices and processes needed for maximum productivity, strategies to resolve common issues in teams, and methods to evaluate team performance.

LEAD 582. LEADING CHANGE: LEADING, MOTIVATING, AND EMPOWERING OTHERS. (3 Credits)
Examines and synthesizes leadership content to form a personal and professional foundation for being remarkable. Drawing on 15 different being remarkable qualities, students will be challenged to develop and apply the skills needed for leadership success.

Agricultural Education Graduate Major (MS)

Graduate Areas of Concentration
Teacher preparation, leadership, and communication in agriculture

The Department of Agricultural Education and General Agriculture offers course work that serves teachers and leaders in agriculture. The Master of Science and Master of Arts in Interdisciplinary Studies degrees may be pursued with an emphasis in leadership, communication, pedagogy, extension, and/or technical agriculture. Candidates work with an advisor to develop programs that meet their specific needs as indicated by their occupational objectives. A person who completes an Agricultural Education master's degree is not solely locked into teaching. Potential occupations also include lobbyist, journalist, and Extension work.

Major Code: 1050

Major Code: 1050
Agricultural Education Graduate Minor

Develop a teaching, pedagogical, leadership development in agriculture minor by working with a departmental advisor.

Minor Code: 1050

Agricultural Sciences and Natural Resources Communications Minor

A minor in agricultural sciences and natural resources communications prepares students for careers in communications and public service roles in the agricultural, natural resources, forestry, and environmental sciences disciplines. This minor allows for students who may be well-versed in the technical knowledge of their science-based agriculture or natural resources discipline to effectively communicate vital information about agriculture and natural resources to a multitude of audiences. Minor requirements provide students a diverse education combining skills and knowledge in agricultural, environmental and natural resources sciences, the social sciences, speech communication, photography, new media communication, and writing. Students will practice effectively communicating issues, research, policy, products, and regulations in their related fields.

Minor Code: 857

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 351</td>
<td>*COMMUNICATING AGRICULTURE TO THE PUBLIC</td>
<td>3</td>
</tr>
<tr>
<td>AG 435</td>
<td>PROFESSIONAL PRESENTATIONS IN AGRICULTURE</td>
<td>3</td>
</tr>
<tr>
<td>AG 445</td>
<td>*SOCIAL MEDIA ADVOCACY IN AGRI SCIENCES &amp; NATURAL RESOURCES</td>
<td>3</td>
</tr>
<tr>
<td>AG 465</td>
<td>AG SCI AND NATURAL RESOURCES COMMUNICATIONS MINOR CAPSTONE (Agricultural Sciences and Natural Resources Communications Minor Capstone [pending approval])</td>
<td>2</td>
</tr>
</tbody>
</table>

Electives

Select 12 credits in at least two different areas of focus from the following courses:

Audio/Visual Production
- NMC 356 PODCAST PRODUCTION
- NMC 380 PRE-PRODUCTION
- NMC 482 DOCUMENTARY

Extension and Outreach Communication
- AG 230 INTRODUCTION TO EXTENSION AND ENGAGEMENT
- AG 350 (Evolution of Agricultural Communications [pending approval])
- AG 455 *RISK AND CRISIS COMMUNICATIONS IN AG SCI & NATURAL RESOURCES (Risk and Crisis Communications in Ag Sci & Natural Resources [pending approval])
- FW 289 COMMUNICATION SKILLS FOR FISHERIES AND WILDLIFE PROFESSIONALS
- FW 489 EFFECTIVE COMMUNICATIONS IN FISHERIES AND WILDLIFE SCIENCE
- NR 312 CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES
- NR 351 *WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT
- SED 435 COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES

Total Hours 29

* Baccalaureate Core Course (BCC)

Agricultural Sciences Minor

Also available at LaGrande.

The Agricultural Sciences minor is designed for students who have an interest in agricultural sciences. The minor is ideal for students who want to add more exposure and content (broadly) within agriculture to their primary major.

Minor Code: 106

The minor requirements listed below are subject to the following:

- 27 credit minimum (15 required, 12 upper-division electives).
- Courses required for a major and taken in the major department may not count towards this minor.
- Students may not use variable credit courses toward the minor.
Courses used to fulfill the requirements must be taken for a letter grade.

Agricultural elective courses for this minor must be upper-division credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 111</td>
<td>INFORMATION TECHNOLOGY IN AGRICULTURE</td>
<td>3</td>
</tr>
<tr>
<td>AG 301</td>
<td>*ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS</td>
<td>3</td>
</tr>
<tr>
<td>AG 351</td>
<td>*COMMUNICATING AGRICULTURE TO THE PUBLIC</td>
<td>3</td>
</tr>
<tr>
<td>AG 412</td>
<td>AG SAFETY AND HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>LEAD 242</td>
<td>PERSONAL LEADERSHIP DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>or LEAD 342</td>
<td>TEAM AND ORGANIZATIONAL LEADERSHIP</td>
<td></td>
</tr>
</tbody>
</table>

Electives
Select 12 credits of upper-division courses, with a minimum of one course from three different areas of study in the College of Agricultural Sciences:

- Animal Sciences
- Applied Economics
- Bioresource Research
- Botany and Plant Pathology
- Crop Science
- Entomology
- Environmental and Molecular Toxicology
- Fisheries and Wildlife
- Food Science and Technology
- Horticulture
- Leadership
- Rangeland Ecology and Management
- Soil Science
- Sustainability

Total Hours: 27

*Baccalaureate Core Course (BCC)

Minor Code: 106

Agricultural Sciences Undergraduate Major (BS, HBS)

Also available at LaGrande and via Ecampus.

Major Code: 259

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC 211</td>
<td>AGRICULTURAL AND FOOD MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>AG 111</td>
<td>INFORMATION TECHNOLOGY IN AGRICULTURE</td>
<td>3</td>
</tr>
<tr>
<td>AG 421</td>
<td>*WRITING IN AGRICULTURE</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE and *SOIL SCIENCE LABORATORY FOR SOIL 205</td>
<td></td>
</tr>
<tr>
<td>&amp; SOIL 206</td>
<td>(Corvallis)</td>
<td></td>
</tr>
<tr>
<td>CSS 205</td>
<td>*SOIL SCIENCE (Ecampus)</td>
<td></td>
</tr>
<tr>
<td>CSS 305</td>
<td>PRINCIPLES OF SOIL SCIENCE (EOU)</td>
<td></td>
</tr>
<tr>
<td>Select 7-10 credits from the following:</td>
<td></td>
<td>7-10</td>
</tr>
<tr>
<td>AED 313</td>
<td>THEORY AND PRACTICUM III: FIELD</td>
<td></td>
</tr>
<tr>
<td>AG 199</td>
<td>SPECIAL STUDIES (Orientation to Agricultural Sciences Major)</td>
<td></td>
</tr>
<tr>
<td>AG 221</td>
<td>METALS AND WELDING</td>
<td></td>
</tr>
<tr>
<td>AG 230</td>
<td>INTRODUCTION TO EXTENSION AND ENGAGEMENT</td>
<td></td>
</tr>
<tr>
<td>AG 301</td>
<td>*ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS</td>
<td></td>
</tr>
<tr>
<td>AG 311</td>
<td>NATIVE AMERICAN AGRICULTURE</td>
<td></td>
</tr>
<tr>
<td>AG 312</td>
<td>ENGINE THEORY AND OPERATION</td>
<td></td>
</tr>
<tr>
<td>AG 318</td>
<td>ACCESSING INFORMATION FOR AGRICULTURAL RESEARCH</td>
<td></td>
</tr>
<tr>
<td>AG 351</td>
<td>*COMMUNICATING AGRICULTURE TO THE PUBLIC</td>
<td></td>
</tr>
<tr>
<td>AG 391</td>
<td>FARM IMPLEMENTS</td>
<td></td>
</tr>
<tr>
<td>AG 412</td>
<td>AG SAFETY AND HEALTH</td>
<td></td>
</tr>
<tr>
<td>AG 435</td>
<td>PROFESSIONAL PRESENTATIONS IN AGRICULTURE</td>
<td></td>
</tr>
<tr>
<td>AG 492</td>
<td>TECHNOLOGY TRANSFER IN AGRICULTURE</td>
<td></td>
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<tr>
<td>AG 499</td>
<td>SPECIAL TOPICS</td>
<td></td>
</tr>
<tr>
<td>AGRI 399</td>
<td>SPECIAL TOPICS (Navigating International Experiences)</td>
<td></td>
</tr>
</tbody>
</table>

Select 60 credits of Agricultural electives (may include above, 24 of which must be upper division)

Business and Law
Select one of the following:

- AEC 253 | ENVIRONMENTAL LAW, POLICY, AND ECONOMICS                    | 4     |
- AGRICULTURAL LAW
- or AEC 388 | BUSINESS LAW I                                      |       |
- or BA 230 | BUSINESS LAW I                                      |       |
- BA 215 | FUNDAMENTALS OF ACCOUNTING                               | 4     |

Communication
Select a Communications/Speech Elective or any WR course above WR 115.

Humanities, Arts and Social Sciences
Select one of the following:

- AEC 250 | INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY          | 3-4   |
- or AEC 251 | INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS          |       |
- or ECON 201 | INTRODUCTION TO MICROECONOMICS                           |       |

Physical and Biological Physical Science/Chemistry

| CH 121 | GENERAL CHEMISTRY                                         | 5     |
| CH 122 | GENERAL CHEMISTRY                                         | 5     |

Biological Sciences—one-year series
Select one of the following one-year series:

- Group A
  - BI 101 | ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE |       |
  - BI 102 | ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE      |       |
  - BI 103 | HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE             |       |
- Group B (preferred)
  - BI 211 | PRINCIPLES OF BIOLOGY                                     |       |
  - BI 212 | PRINCIPLES OF BIOLOGY                                     |       |
  - BI 213 | PRINCIPLES OF BIOLOGY                                     |       |
- Group C
  - BI 204 | INTRODUCTORY BIOLOGY I                                    |       |
  - BI 205 | INTRODUCTORY BIOLOGY II                                   |       |
  - BI 206 | INTRODUCTORY BIOLOGY III                                  |       |

Leadership and Engagement
Select one of the following:

- AG 230 | INTRODUCTION TO EXTENSION AND ENGAGEMENT                   | 3     |
- LEAD 242 | PERSONAL LEADERSHIP DEVELOPMENT                           |       |
- LEAD 342 | TEAM AND ORGANIZATIONAL LEADERSHIP                       |       |
- LEAD 442 | LEADERSHIP SKILLS FOR CAREER SUCCESS                      |       |
- LEAD 443 | LEADERSHIP THROUGH CONVERSATIONS                         |       |

Math

| MTH 111 | COLLEGE ALGEBRA                                           | 4     |

Electives 1 48-52

Total credits required for graduation 180

1 A minimum of 45 of these elective credits must come from College of Agricultural Sciences. Remaining credits may be approved from other disciplines, to reach 60 total Ag Science electives.

* Baccalaureate Core Course (BCC)

Writing Intensive Course (WIC)
### Major Code: 259

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AG 199</td>
<td>SPECIAL STUDIES (Orientation Ag Sci Major)</td>
<td>1</td>
</tr>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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</table>

#### Biology Series

<table>
<thead>
<tr>
<th>Group A: General Biology</th>
<th></th>
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<tbody>
<tr>
<td>BI 101</td>
<td>*ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE</td>
<td></td>
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<tr>
<td>BI 102</td>
<td>*ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE</td>
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<tr>
<td>BI 103</td>
<td>*HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE</td>
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</table>

<table>
<thead>
<tr>
<th>Group B: Principles of Biology</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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</tr>
<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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</table>

<table>
<thead>
<tr>
<th>Group C: Introductory Biology</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>BI 204</td>
<td>*INTRODUCTORY BIOLOGY I</td>
<td></td>
</tr>
<tr>
<td>BI 205</td>
<td>*INTRODUCTORY BIOLOGY II</td>
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<tr>
<td>BI 206</td>
<td>*INTRODUCTORY BIOLOGY III</td>
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#### Hours

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<tr>
<th>Component</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Total</td>
<td>12</td>
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</tbody>
</table>

| **Winter** |                                                                 |       |
| AG 111      | INFORMATION TECHNOLOGY IN AGRICULTURE                           | 3     |
| BI 212      | *PRINCIPLES OF BIOLOGY                                          | 4     |
| COMM 111    | *PUBLIC SPEAKING                                                | 3     |
| or COMM 114 | or *ARGUMENT AND CRITICAL DISCOURSE                            |       |
| HHS 231     | *LIFETIME FITNESS FOR HEALTH                                    | 2     |
| Elective-Any College of Agricultural Sciences course | 3     |

| **Spring** |                                                                 |       |
| AGRI 399   | SPECIAL TOPICS (Navigate Global Experiences)                     | 1     |
| BI 213     | *PRINCIPLES OF BIOLOGY                                          | 4     |
| WR 222     | *ENGLISH COMPOSITION                                             | 3     |
| Bacc Core-WIC |                                                   | 3     |
| Elective for major             |                                                                | 3     |
| Any PAC course                   |                                                               | 1     |

#### Hours

<table>
<thead>
<tr>
<th>Component</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Total</td>
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</tbody>
</table>

| **Second Year** |                                                                 |       |
| **Fall**        | AEC 251 *INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS        | 3     |
| CH 121          | GENERAL CHEMISTRY                                              | 5     |
| SOIL 205        | SOIL SCIENCE                                                   | 3     |
| SOIL 206        | *SOIL SCIENCE LABORATORY FOR SOIL 205                          | 1     |
| Elective-Any College of Agricultural Sciences course | 3     |

#### Hours

<table>
<thead>
<tr>
<th>Component</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>15</td>
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</table>

| **Winter** |                                                                 |       |
| AEC 211    | AGRICULTURAL AND FOOD MANAGEMENT                                  | 4     |
| AG 230     | INTRODUCTION TO EXTENSION AND ENGAGEMENT                          | 3     |
| AG 301     | *ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS                         | 3     |
| CH 122     | *GENERAL CHEMISTRY                                              | 5     |

#### Hours

<table>
<thead>
<tr>
<th>Component</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>15</td>
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</table>

| **Spring** |                                                                 |       |
| LEAD 342   | TEAM AND ORGANIZATIONAL LEADERSHIPS                              | 3     |
| Bacc Core-CD |                                                   | 3     |
| Bacc Core-LA |                                               | 3     |
| Elective-Any College of Agricultural Sciences course | 4     |

#### Hours

<table>
<thead>
<tr>
<th>Component</th>
<th>Hours</th>
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<tbody>
<tr>
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#### Total Hours

<table>
<thead>
<tr>
<th>Component</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>180-184</td>
</tr>
</tbody>
</table>

1. Biology series differ between campus and Ecampus. Campus students may take any Biology in these series. Ecampus students will expect to take BI 204, 205, 206 (Group C).

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

### Comparative International Agriculture Minor

The minor provides students with formal instruction in international agricultural concepts and practical experiences through global awareness course work, language immersion via study/research abroad, and/or international fieldwork. The 27-credit curriculum prepares students for successful postbaccalaureate international careers, or those seeking graduate studies in international agriculture programs.
Students critically examine current international agricultural issues and/or diversity and communications. To be eligible to apply for this minor, students must have a cumulative 2.0 GPA or higher and be in good standing with Oregon State University. Students must also be in a declared major. Participants in this minor program are able to:

1. Research the major agricultural themes and issues of another nation besides the United States of America.
2. Examine trade information to determine the key elements of agricultural trade agreements between the USA and another country.
3. Analyze the effectiveness of agricultural practices of another nation besides the USA.
4. Investigate the effect of broad social, economic, and environmental forces upon the agricultural industry of another nation besides the USA.

Minor Code: 477

All 27 credits for the minor must be completed with a C or higher grade. Students can complete 12 to 18 upper-division credits and a maximum of 14 lower division credits.

**Code Title Hours**

**Required**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 438</td>
<td>EXPLORING WORLD AGRICULTURE</td>
<td>2</td>
</tr>
</tbody>
</table>

**Global Core**

Select 9-12 credits of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 301</td>
<td>*ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS</td>
<td></td>
</tr>
<tr>
<td>ANTH 210</td>
<td>*COMPARATIVE CULTURES</td>
<td></td>
</tr>
<tr>
<td>ANTH 330</td>
<td>*EVOLUTION OF PEOPLE, TECHNOLOGY, AND SOCIETY</td>
<td></td>
</tr>
<tr>
<td>ANTH 486</td>
<td>ANTHROPOLOGY OF FOOD</td>
<td></td>
</tr>
<tr>
<td>CROP 330</td>
<td>*WORLD FOOD CROPS</td>
<td></td>
</tr>
<tr>
<td>FW 325</td>
<td>*GLOBAL CRISIS IN RESOURCE ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>GEOG 105</td>
<td>* GEOGRAPHY OF THE NON-WESTERN WORLD</td>
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<tr>
<td>GEOG 330</td>
<td>**GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
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<tr>
<td>GEOG 431</td>
<td>GLOBAL RESOURCES AND DEVELOPMENT</td>
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<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
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<tr>
<td>PS 204</td>
<td>*INTRODUCTION TO COMPARATIVE POLITICS</td>
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<tr>
<td>PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
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**External Learning Experience**

Select 3-6 credits of the following:

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<th>Code</th>
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<tr>
<td>AG 401</td>
<td>RESEARCH</td>
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<tr>
<td>AG 402</td>
<td>INDEPENDENT STUDIES</td>
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<td>AG 406</td>
<td>SPECIAL PROBLEMS</td>
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<tr>
<td>AG 410</td>
<td>INTERNSHIP</td>
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**Electives**

Select a maximum of 12 credits of approved electives of the following areas of study:

- AEC Applied Economics
- AG General Agriculture
- AGRI College of Agricultural Sciences
- ANS Animal Sciences
- BOT Botany and Plant Pathology
- CSS Crop and Soil Science
- CROP Crop Science
- ENT Entomology
- FST Food Science Technology
- FW Fisheries and Wildlife
- HORT Horticulture
- RNG Rangeland Ecology and Management
- SOIL Soil Science
- SUS Sustainability

**Leadership Minor**

The Leadership minor is designed for all undergraduates interested in developing premier leadership, enhancing professional competencies, and fostering the skills necessary to meet the local, national, and international needs of our society. The Leadership minor is centered on leadership theory (education), trait/skill development (training), and application (development). It is designed to allow students to apply the coursework in a relevant and relational manner.

Specifically, the course work focuses on major theories of leadership including contingency, path-goal, leader-member exchange theories as well as transformational, authentic, team, and servant leadership. Within each theory and type of leadership, students will be challenged to consider leadership ethics, leadership culture, gender in leadership, and integration of leadership into personal, civic, and social change. In addition, the elective courses allow students to pursue the development of trait and skill competencies necessary for employment in their chosen field. Students will then have the opportunity to directly apply their learning through a leadership internship, service learning project, or research opportunity.

**Minor Code: 267**

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<tr>
<th>Code</th>
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<td>LEAD 242</td>
<td>PERSONAL LEADERSHIP DEVELOPMENT (Available via Ecampus)</td>
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<tr>
<td>LEAD 342</td>
<td>TEAM AND ORGANIZATIONAL LEADERSHIP (Available via Ecampus)</td>
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<tr>
<td>LEAD 444</td>
<td>LEADERSHIP MINOR CAPSTONE (Available via Ecampus)</td>
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**Leadership Theory**

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<tr>
<td>LEAD 242</td>
<td>PERSONAL LEADERSHIP DEVELOPMENT (Available via Ecampus)</td>
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<td>LEAD 342</td>
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<td>LEAD 444</td>
<td>LEADERSHIP MINOR CAPSTONE (Available via Ecampus)</td>
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**Trait/Skill Development**

Select 10 credits from the following:

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<tr>
<td>AG 351</td>
<td>*COMMUNICATING AGRICULTURE TO THE PUBLIC</td>
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<tr>
<td>ALS 295</td>
<td>LAST YEAR EXPERIENCE</td>
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<tr>
<td>AS 311</td>
<td>LEADERSHIP FUNDAMENTALS, TEAM BUILDING AND PROBLEM SOLVING</td>
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<tr>
<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
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<td>COMM 316</td>
<td>ADVANCED PERSUASION</td>
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<tr>
<td>COMM 322</td>
<td>SMALL-GROUP PROBLEM SOLVING (Available via Ecampus)</td>
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<tr>
<td>IE 470</td>
<td>MANAGEMENT SYSTEMS ENGINEERING</td>
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<td>KIN 230</td>
<td>INTRODUCTION TO ADVENTURE PROGRAMS</td>
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<tr>
<td>KIN 231</td>
<td>HUMAN GROUP DYNAMICS</td>
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<tr>
<td>KIN 232</td>
<td>BACKCOUNTRY LEADERSHIP</td>
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<tr>
<td>LEAD 442</td>
<td>LEADERSHIP SKILLS FOR CAREER SUCCESS (Available via Ecampus)</td>
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<td>LEAD 443</td>
<td>LEADERSHIP THROUGH CONVERSATIONS (Available via Ecampus)</td>
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<tr>
<td>MS 211</td>
<td>MILITARY SCIENCE II: FOUNDATIONS OF LEADERSHIP</td>
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<td>NS 211</td>
<td>LEADERSHIP AND MANAGEMENT</td>
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<tr>
<td>PAC 301</td>
<td>ALI: CHALLENGE COURSE EXPERIENCE</td>
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Animal and Rangeland Sciences

The multiple facets of Animal Sciences provides current information on the different production methods involved in the care and management of companion animals, livestock, and poultry. These facets address the production of meat, milk, eggs, wool, and other animal services such as companionship, work, and recreation. In addition, the department addresses the care/well-being of animals as it impacts and enhances the human/animal bond along with the production levels of those animals. Essential to this information is the knowledge generated from the field of animal behavior/bioethics, genetics, nutrition, reproduction, and physiology.

The curriculum designates university and departmental requirements for the BS degree in Animal Sciences. In addition, there are five specialized program options students can choose to pursue. These include: Animal Behavior, Animal BioHealth/Pre-Professional, Animal Production, Equine, and Rangeland Sciences. Diverse teaching and research programs allow students to gain skills, knowledge, and practical experience. This will prepare students graduating from the program to pursue an assortment of employment opportunities. Potential employment areas may include farm and ranch management; product quality assessment of meat, poultry, eggs and milk; the Cooperative Extension Service; sales or technical service with commercial feed, seed, and chemical companies and pharmaceutical firms; agricultural loan officer; government agency positions at local, state, and federal levels; animal welfare auditing; animal behavior consulting; business management; as well as journalism, mass media, and public policy. In addition, students are prepared to go on to advanced studies in animal sciences, veterinary medicine, pharmacy schools, human medicine, nursing schools, dental schools, and education.

Graduate work leading to MS or PhD degrees in Animal Sciences may involve research projects that concentrate on areas such as animal nutrition, dairy production, embryo physiology, endocrinology, growth and development, livestock management, nutritional biochemistry, and reproduction physiology.

Cooperative Programs

Students transferring after one or two years at a community college should also be able to complete the requirements for a BS after three or two years, respectively.

Rangeland Sciences

Rangeland Sciences consist of the study and sustainable management of rangelands across a variety of biomes, from arid deserts to mesic grasslands, to tropical savannahs. The program takes an interdisciplinary approach to provide advanced scientific knowledge regarding multiple ecological processes and social drivers influencing rangeland ecosystems around the globe. Students in Rangeland Sciences gain the skills and knowledge needed to fully understand and effectively manage rangelands for improved productivity and enhanced ecosystem resilience. Students graduating from the program will be able to integrate contemporary rangeland ecology and management principles into systems-based decision-making frameworks to promote ecological resilience, sustainable societies, and thriving economies in rangeland ecosystems. The Rangeland Sciences degree program is available in both On-campus and E-campus environments.

The curriculum below includes university and departmental requirements for the BS degree in Rangeland Sciences. Besides the base program, it offers specialization options in Sustainable Rangeland Ecosystem Stewardship, Habitat Management, Pastoral Systems of the World, and Sustainable Livestock Ranching. It also provides the opportunity for doing a minor in the subject of interest for the student (e.g., Animal Sciences).

There are a variety of scholarships and student employment opportunities available to students in the Rangeland Sciences program. There are opportunities all year along for students to gain practical experience in various research projects conducted by faculty in the program. Also, there are several options for summer employment with private industry, government agencies, and on range research projects.

The Rangeland Sciences program is accredited by the professional Society for Range Management (SRM). Accreditation ensures that graduates from the program have the necessary knowledge to join the rangeland science profession regardless of where in the world they may end up launching a job. Accreditation with SRM also helps to build a map to Federal OPM course requirements for multiple 400-series Biological Sciences positions (i.e., 401 Natural Resources Management and Biological Sciences; 408 Ecology Series; 454 Range Management Series; and 457 Soil Conservation Series). This is an important feature of the Rangeland Sciences program as many students go on to careers with federal or state agencies.

Graduate work leading to MAIS, MS, or PhD degrees in Rangeland Sciences may involve research on habitat management and restoration, watershed and riparian systems management, land use-environment relationships, ecohydrology, agroecology, ecophysiology, pastoral systems, and landscape ecology.

Undergraduate Programs

Majors

- Animal Sciences (p. 64)
  Options:
  - Animal Behavior
  - Animal BioHealth/Pre-Professional
Animal Science

ANS 100. ORIENTATION TO ANIMAL AND RANGELAND SCIENCES. (1 Credit)
Designed to provide incoming Animal and Rangeland Sciences students an introduction to college life at OSU with an emphasis on the faculty, facilities, services, and the curricula of the Department of Animal and Rangeland Sciences.

ANS 121. *INTRODUCTION TO ANIMAL SCIENCES. (4 Credits)
Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: ANS 121H

ANS 121H. *INTRODUCTION TO ANIMAL SCIENCES. (4 Credits)
Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: ANS 121

ANS 207. SOPHOMORE SEMINAR. (2 Credits)
Examination of career opportunities in animal sciences.

ANS 215. BEEF/DAIRY INDUSTRIES. (3 Credits)
Introduction to beef and dairy industries; history, current industry status, and demonstration and practice of basic husbandry skills.
Recommended: ANS 121

ANS 216. SMALL RUMINANT/SWINE INDUSTRIES. (3 Credits)
Introduction to the small ruminant and swine industries including history, current status and production practices, with demonstration and hands-on experience of basic husbandry practices.
Recommended: ANS 121

ANS 217. POULTRY INDUSTRIES. (3 Credits)
Familiarization of the organizational structure and marketing arrangement of poultry industries; hands-on managerial techniques, practices and procedures carried out by the poultry industries.

ANS 220. INTRODUCTORY HORSE SCIENCE. (3 Credits)
Introduction to horses, their history, breeds, form and function, performance evaluation, current industry status, and general management.
Recommended: ANS 121

ANS 223. EQUINE MARKETING. (2 Credits)
Course covers practical concepts of equine marketing. Emphasis on market assessment, targeting buyers, marketing and advertising strategies, hands-on experience in product preparation and presentation, marketing legalities.
Recommended: ANS 121, ANS 220 and ANS 192

ANS 231. LIVESTOCK EVALUATION. (3 Credits)
Focuses on an individual animal’s economic merit as compared to a sample group. Visual appraisal, performance data, and carcass merit are stressed. Includes the evaluation of both market and breeding animals. The livestock species of concentration include beef cattle, swine, sheep, and meat goats. Lec/lab.
Recommended: ANS 121

ANS 251. PRINCIPLES OF ANIMAL FOODS TECHNOLOGY. (3 Credits)
Processing of meat, milk and eggs into human food products. Lec/lab.
Recommended: ANS 121
ANS 280. COMPANION ANIMAL MANAGEMENT. (4 Credits)
An introduction to the challenges, responsibilities, and benefits of interaction with selected companion animals. Topics covered will provide an overview of the human-animal bond, the position of companion animals in society, ethical issues of pet ownership and potential career opportunities. In addition, the course will serve as an introduction to preventive care and normal behavior of dogs, cats, and selected exotic pets. As the Department of Animal and Rangeland Sciences curriculum offers courses addressing equine care and husbandry, horses will not be discussed in this class.

ANS 302. COMMON DISEASES OF COMPANION ANIMALS. (4 Credits)
An introduction to common diseases of selected companion animals. Emphasis will be placed on identifying predisposing factors, clinical signs, common diagnostic procedures and potential implications for human health. A $10 course fee will be required. Lec/rec.
Prerequisites: (CH 121 [D-] or CH 221 [D-] or CH 231 [D-] or CH 231H [D-]) and CH 121 [D-] and CH 122 [D-] and CH 123 [D-]
Recommended: ANS 280

ANS 311. PRINCIPLES OF ANIMAL NUTRITION. (3 Credits)
Classification, digestion, absorption, and metabolism of nutrients in animals; consequences of nutritional deficiencies and toxicities.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-]) and (BI 213 [D-] or BI 213H [D-]) and CH 121 [D-] and CH 122 [D-] and CH 123 [D-]
Recommended: ANS 280

ANS 313. APPLIED ANIMAL NUTRITION: FEEDS AND RATION FORMULATION. (4 Credits)
Discusses topics relevant to feedstuff identification and nutritional analysis, feed processing and formulation of balanced animal diets based on nutrient requirements. Provides students hands-on experiences in identifying various feedstuffs and formulating rations based on the nutrient composition of those feedstuffs. Also offered at EOU and through Ecampus.
Recommended: MTH 111

ANS 314. ANIMAL PHYSIOLOGY. (4 Credits)
Biological basis of animal performance; describes how networks of cells act cooperatively to enable locomotion, provide a stable internal environment, allocate resources, remove metabolic end-products, and counteract microorganisms.
Recommended: General principles of biology equivalent to BI 211, BI 212, BI 213 and junior standing or higher

ANS 315. *CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE. (3 Credits)
Discussion of contentious issues including role of animal products and human health; use of hormones and antibiotics; new animal biotechnologies; animal rights/welfare; livestock grazing on public lands. (Bacc Core Course).
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ANS 316. REPRODUCTION IN DOMESTIC ANIMALS. (4 Credits)
Anatomy and physiology of mammalian and avian reproductive systems; fertilization, embryonic and fetal development, placentation and parturition; reproductive technologies. Lec/rec.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (CH 121 [D-] or CH 221 [D-] or CH 231 [D-] or CH 231H [D-])
Recommended: ANS 121

ANS 317. REPRODUCTION IN DOMESTIC ANIMALS LABORATORY. (1 Credit)
Gross and microscopic anatomy of the reproductive tract; semen collection, evaluation and extension; evaluation of fertilization, embryo and fetal development and placentation. Lec/lab.
Prerequisites: ANS 316 (may be taken concurrently) with D- or better

ANS 320. PRINCIPLES OF COMPANION ANIMAL NUTRITION. (3 Credits)
Learn about nutrients, the digestive process, and the application of nutritional sciences to the health and welfare of companion animals. Introduction to the metabolic basis and practical preventative management for nutritional diseases in companion animals.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-])

ANS 321. AVIAN EMBRYO. (4 Credits)
Discussion and experimentation involving the development and the environmental requirements for the artificial incubation of avian embryos. Lec/lab. Offered even-numbered years.
Recommended: ANS 121 and ANS 217 and BI 211

ANS 331. ADVANCED LIVESTOCK EVALUATION. (4 Credits)
Aspects of an individual animal's economic merit are compared to a sample group. Emphasis is placed on beef, swine and sheep. Visual appraisal, performance data and carcass merit are stressed. Designed to prepare students for the intercollegiate livestock judging team.
This course is repeatable for 12 credits.
Recommended: ANS 231

ANS 333. EQUINE STABLE MANAGEMENT. (3 Credits)
Discusses developing a business plan, financial statements, and ratios, budgeting, financial planning, taxation, and employment issues within the current equine industry.
Prerequisites: ANS 220 with D- or better
Recommended: ANS 222

ANS 335. EQUINE HEALTH AND DISEASE. (3 Credits)
Recognition of common diseases and disorders including their cause, treatment and prevention. Management of internal and external parasites. Recognizing common lameness issues.

ANS 341. ANIMAL BEHAVIOR AND COGNITION. (3 Credits)
Survey, discuss, and explore principles of animal behavior and cognition from a comparative perspective, taking into account the interacting influences of biology, environment, and life experience on the individual and group behavior of animals across species. Aspects of animal cognition, including reasoning, perception, memory and personality, that play an important role in animal behavior will also be addressed.
Prerequisites: BI 102 with D or better or BI 213 with D or better

ANS 351. ADVANCED PRINCIPLES OF ANIMAL FOODS TECHNOLOGY. (4 Credits)
Provides in-depth coverage of both fresh and processed meats and eggs into products suitable for human consumption.
Recommended: ANS 251

ANS 378. ANIMAL GENETICS. (4 Credits)
Fundamentals of inheritance, principles of genetic segregation, population and quantitative genetics, response to natural selection and artificial manipulation of populations.
Prerequisites: BI 211 with D- or better or BI 212 with D- or better or BI 213 with D- or better
Recommended: ANS 121 and ST 351
ANS 380. PRINCIPLES OF ANIMAL ANATOMY AND PHYSIOLOGY. (3 Credits)
An introductory course in animal anatomy to provide a foundation for advanced courses in the Animal Science curriculum. Emphasis is on acquisition of a basic knowledge of minute and gross anatomical structures, their operation, and integration. Begins with anatomical nomenclature such as body planes and directional terms then covers the following tissues and organ systems: epithelium, connective tissue, blood and bone marrow, bone/cartilage, muscle tissue, nervous tissue, digestive system, circulatory system, reproductive system, urinary system, and respiratory system.
Prerequisites: (BI 211 with D or better or BI 211H with D or better) and (BI 212 [D] or BI 212H [D]) and (BI 213 [D] or BI 213H [D])

ANS 385. FOUNDATIONS OF MAMMALIAN HISTOLOGY. (3 Credits)
Provides a basic knowledge of mammalian microscopic anatomy. Emphasis will be on the appearance, organization and function of minute anatomical structures that can only be observed with the help of a visual enhancer, such as a microscope. Covers basic histological techniques and histology and related functions of the following tissues and organ systems: epithelium, connective tissue, bone/cartilage, blood, muscle tissue, nervous tissue, circulatory system, digestive system, reproductive system, urinary system, respiratory system, immune system, integument, eye and ear. Also covers gametogenesis, fertilization, and early development of the vertebrate embryo. Lec/rec.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (BI 314 [C-] or BI 314H [C-])

ANS 390. GROSS ANATOMY OF DOMESTIC ANIMALS. (4 Credits)
Provides a foundation for advanced courses in the Animal Sciences curriculum. Emphasis on gaining knowledge of mammalian anatomy. Lectures cover anatomical nomenclature, structure, operation, and integration of major organ systems. The dog is used as the general model while comparative domestic animal anatomy is also covered. Lec/lab.
Prerequisites: (BI 211 with D or better or BI 211H with D or better) and (BI 212 [D] or BI 212H [D]) and (BI 213 [D] or BI 213H [D])

ANS 401. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ANS 405. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 407. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 410. ANIMAL SCIENCE INTERNSHIP. (1-12 Credits)
On- or off-campus, occupational work experience supervised by the department. Graded P/N.
This course is repeatable for 16 credits.

ANS 415. LIVESTOCK JUDGING TEAM. (3 Credits)
Designed to train students for participation in the intercollegiate livestock judging team.
This course is repeatable for 9 credits.
Recommended: ANS 331

ANS 420. *ETHICAL ISSUES IN ANIMAL AGRICULTURE. (3 Credits)
Students are provided with an opportunity to discuss, debate and write extensively about current, relevant, and controversial social issues dealing with modern animal agriculture. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ANS 427. APPLIED PHYSIOLOGY OF REPRODUCTION. (5 Credits)
Principles, techniques and recent development in semen collection, evaluation, extension and preservation; artificial insemination, estrus detection and synchronization; pregnancy diagnosis and embryo transfer.
Prerequisites: ANS 316 with C or better and ANS 317 [C]
Equivalent to: ANS 327

ANS 430. EQUINE SYSTEMS I: EXERCISE SCIENCE. (4 Credits)
Seniors and graduate students intensively explore and apply science to real-life situations regarding cardiorespiratory, muscle physiology, and bone physiology responses to exercise, climate, and altitude. Lec/lab.
Recommended: ANS 314

ANS 431. EQUINE SYSTEMS II: NUTRITION. (3 Credits)
Senior and graduate students intensively explore and apply science to real-life situations regarding starch, fiber, protein, and fat metabolism in performance horses, breeding stock, and growing horses.
Recommended: ANS 313

ANS 432. EQUINE SYSTEMS III: REPRODUCTION. (4 Credits)
Senior and graduate students explore the fundamentals of equine reproduction and their application in horse breeding. Includes practical training of laboratory techniques. Lec/lab.
Prerequisites: ANS 220 with D- or better and ANS 316 [D-]
Recommended: ANS 327

ANS 433. POULTRY MEAT PRODUCTION SYSTEMS. (3 Credits)
Fundamental applications and the analysis of management principles applied to brooding, rearing, feeding and housing meat-type chickens and turkeys and their respective breeders. Decision case studies and practical management problems are incorporated into the course. Offered odd number years.
Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378

ANS 434. EGG PRODUCTION SYSTEMS. (3 Credits)
Applications and analyses of egg production systems for brooding, rearing, feeding and housing egg producing chickens. Decision case studies and practical management problems are incorporated into the course. Offered even-numbered years.
Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378

ANS 435. APPLIED ANIMAL BEHAVIOR. (3 Credits)
Exploration of the fundamental processes of animal behavior and implications for animal management, production, housing and welfare. Examples provided in class will cover a range of species, with emphasis on domestic animals. Lec/lab.
Recommended: ANS 314 and BI 350 or Z 350

ANS 436. SHEEP PRODUCTION SYSTEMS. (3 Credits)
Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool.
Recommended: ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 439. DAIRY PRODUCTION SYSTEMS. (4 Credits)
Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle.
Recommended: ANS 215 and ANS 313 and ANS 316 and ANS 378
ANS 440. DAIRY PRODUCTION SYSTEMS. (3 Credits)
Decision case analysis or special topics in application of dairy management principles.
Prerequisites: ANS 439 with D- or better

ANS 441. TOPICS IN ANIMAL LEARNING. (3 Credits)
Explore when and how the behavior of animals can be shaped by the environment, individual experiences, and interactions with other animals (including humans).
Prerequisites: BI 211 with D- or better and BI 212 [D-]
Recommended: ANS 435 or ANS 535 and (BI 350 or Z 350) and BI 213

ANS 443. BEEF PRODUCTION SYSTEMS: COW/CALF. (4 Credits)
Fundamentals of nutrition, reproductive physiology, health and care, and financial management of beef cow/calf operations in the western U.S. Discussions will focus on critical management stages and practices common to the beef cow/calf production cycle. Taught at EOU La Grande campus only.
Recommended: ANS 121 and ANS 313 and (BA 321 or AEC 211)

ANS 444. BEEF PRODUCTION SYSTEMS: STOCKER/FEEDLOT. (4 Credits)
A continuation of the study of beef cattle management. Content will encompass the growth and development of weaned calves through slaughter for consumer beef production, with particular focus on the management of growing and yearling cattle in forage-based (stocker cattle) and drylot (feedlot) systems. Taught at EOU La Grande campus only.
Recommended: ANS 121 and ANS 313 and (BA 321 or AEC 211)

ANS 445. BEEF PRODUCTION SYSTEMS. (4 Credits)
Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of beef cattle from conception through calving, weaning, stocker/back grounding and the feedlot. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 121 and ANS 313 and (BA 321 or AEC 211)

ANS 446. GRAZING LIVESTOCK PRODUCTION. (4 Credits)
Equips non-animal science majors with basic ruminant livestock (beef cattle, sheep and meat goat) production knowledge, so they may communicate and collaborate effectively with livestock producers.
Prerequisites: ANS 121 with D- or better

ANS 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. crosslisted as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: CROP 448, RNG 448

ANS 452. LIVESTOCK HOUSING AND WASTE MANAGEMENT. (3 Credits)
Basics in where, how, and why one would build, insulate, and ventilate livestock buildings. Manure and wastewater collection, treatment, storage, and utilization.

ANS 456. COMPANION ANIMAL PRODUCTION SYSTEMS. (3 Credits)
Fundamentals of dog and cat breeding stock selection, feeding and housing as well as biology and management from estrus through parturition to weaning. Due to the nature of this class, a variety of animals may be present during class session. Questions and interactions are encouraged but, while precautions are taken, any contact with animals carries some risk of injury or illness.
Prerequisites: (ANS 313 with D- or better and ANS 316 (may be taken concurrently) [D-] and ANS 317 (may be taken concurrently) [D-] and ANS 378 [D-])

ANS 460. SWINE PRODUCTION SYSTEMS. (4 Credits)
Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of swine from conception through farrowing, weaning, and the growing/finishing phases. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 121 and ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

ANS 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 503. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

ANS 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 507. GRADUATE SEMINAR. (1 Credit)
Section 1: Seminar/general for all graduate students. Preparation of effective visual aids. Practice explaining the validity or significance of experimental results to an informed audience. Section 2: Seminar/endocrinology, for graduate students interested in physiology.
This course is repeatable for 99 credits.

ANS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ANS 509. TEACHING PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ANS 511. DIGESTIVE PHYSIOLOGY AND NUTRITION OF RUMINANT ANIMALS. (4 Credits)
Anatomy and physiology of the ruminant digestive tract including rumen microbiology and digestive processes. Nutritional biochemistry and physiology of ruminants. Feed chemistry, feed intake and principles of ration balancing. Theory of energy and protein metabolism.
Recommended: ANS 311 or ANS 313

ANS 512. MONOGASTRIC AND POULTRY NUTRITION. (3 Credits)
Anatomical differences in digestive tracts of monogastrics; nutritional biochemistry of poultry; practical feeding of avian species; least-cost ration techniques; techniques for determining nutrient needs of monogastrics.
Recommended: ANS 311 and ANS 313

ANS 515. REVIEW OF APPLIED RUMINANT NUTRITION RESEARCH TECHNIQUES. (3 Credits)
Review and discussion and applied techniques and methodology used for ruminant nutrition research.
ANS 530. EQUINE SYSTEMS I: EXERCISE SCIENCE. (4 Credits)
Senior and graduate students intensively explore and apply science to real-life situations regarding cardiorespiratory, muscle physiology, and bone physiology responses to exercise, climate, and altitude. Lec/lab.
Recommended: ANS 314

ANS 531. EQUINE SYSTEMS II: NUTRITION. (3 Credits)
Senior and graduate students intensively explore and apply science to real-life situations regarding starch, fiber, protein, and fat metabolism in performance horses, breeding stock, and growing horses.
Recommended: ANS 313

ANS 532. EQUINE SYSTEMS III: REPRODUCTION. (4 Credits)
Designed for seniors and graduate students to explore the fundamentals of equine reproduction and their application in horse breeding. Includes practical training in laboratory techniques. Lec/lab.
Equivalent to: BI 532
Recommended: ANS 220 and ANS 316 and ANS 327

ANS 533. POULTRY MEAT PRODUCTION SYSTEMS. (3 Credits)
Fundamental applications and the analysis of management principles applied to brooding, rearing, feeding and housing meat-type chickens and turkeys and their respective breeders. Decision case studies and practical management problems are incorporated into the course. Offered odd number years.
Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378

ANS 534. EGG PRODUCTION SYSTEMS. (3 Credits)
Applications and analyses of egg production systems for brooding, rearing, feeding and housing egg producing chickens. Decision case studies and practical management problems are incorporated into the course. Offered even-numbered years.
Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378

ANS 535. APPLIED ANIMAL BEHAVIOR. (3 Credits)
Exploration of the fundamental processes of animal behavior and implications for animal management, production, housing and welfare. Examples provided in class will cover a range of species, with emphasis on domestic animals. Lec/lab.
Recommended: ANS 314 and BI 350 or Z 350

ANS 536. SHEEP PRODUCTION SYSTEMS. (3 Credits)
Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool.
Recommended: ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 538. BIOLOGY OF LACTATION. (3 Credits)
Physiological and environmental factors affecting mammary gland development and function. Offered alternate years.
Recommended: Z 431 or Z 531

ANS 539. DAIRY PRODUCTION SYSTEMS. (4 Credits)
Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle.
Recommended: ANS 215 and ANS 313 and ANS 316 and ANS 378

ANS 540. DAIRY PRODUCTION SYSTEMS. (3 Credits)
Decision case analysis or special topics in application of dairy management principles.
Recommended: ANS 439

ANS 541. TOPICS IN ANIMAL LEARNING. (3 Credits)
Explore when and how the behavior of animals can be shaped by the environment, individual experiences, and interactions with other animals (including humans).
Recommended: BI 211 and BI 212 and BI 213 and (ANS 435 or ANS 535) and (BI 350 or Z 350)

ANS 543. BEEF PRODUCTION SYSTEMS: COW/CALF. (3 Credits)
Fundamentals of nutrition, reproductive physiology and health programs and their applications in the care and management of beef cattle. Overnight field trip with extra fee charged. Lec/lab. Taught at EOU La Grande campus only.
Recommended: ANS 315 and ANS 313 and ANS 316 and ANS 378

ANS 544. BEEF PRODUCTION SYSTEMS: STOCKER/FEEDLOT. (3 Credits)
Continuation of the study of beef cattle management. Students will practice decision-making processes using area beef cattle operations as case studies. Overnight field trip with extra fee charged. Taught at EOU La Grande campus only.
Recommended: ANS 443 or ANS 543

ANS 545. BEEF PRODUCTION SYSTEMS. (4 Credits)
Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of beef cattle from conception through calving, weaning, stocker/back grounding and the feedlot. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 313 and ANS 316 and ANS 317 and ANS 378

ANS 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSTLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: CROP 548, RNG 548

ANS 550. ORGANIC ANIMAL PRODUCTION SYSTEMS. (3 Credits)
Topics include the principles of livestock production, legislation, animal welfare, and marketing of organic production systems. Course emphasizes principles, concepts, and techniques of organic and sustainable production of animals.

ANS 552. LIVESTOCK HOUSING AND WASTE MANAGEMENT. (3 Credits)
Basics in where, how, and why one would build, insulate, and ventilate livestock buildings. Manure and wastewater collection, treatment, storage, and utilization. Offered alternate years.

ANS 556. COMPANION ANIMAL PRODUCTION SYSTEMS. (3 Credits)
Fundamentals of dog and cat breeding stock selection, feeding and housing as well as biology and management from estrus through parturition to weaning. Due to the nature of this class, a variety of animals may be present during class session. Questions and interactions are encouraged but, while precautions are taken, any contact with animals carries some risk of injury or illness.
Recommended: ANS 313 and ANS 378 and completion or concurrent enrollment in ANS 316 and ANS 317
RNG 299. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: RNG 299
This course is repeatable for 16 credits.

RNG 341. RANGELAND ECOLOGY AND MANAGEMENT. (3 Credits)
Nature and management of rangelands. Integrated land use with emphasis on plant-animal-soil interactions.
Equivalent to: RNG 241

RNG 351. RANGE ECOLOGY I-GRASSLANDS. (3 Credits)
Principles and terminology of grassland ecology. Addresses the spatial-temporal dynamics of structure, function, and process in North American grassland ecosystems. Water, nutrient cycles and energy pathways are explored in context of the variable driving forces of climate (drought), herbivory, and fire.
Recommended: (BOT 313 [D-] and RNG 341 [D-])

RNG 352. RANGE ECOLOGY II-SHRUBLANDS. (3 Credits)
Introduces the ecology of shrublands using an autecological approach. Explores the effects of stressors such as temperature, drought, fire, and herbivory on plant morphology, physiology, reproduction, and growth. Covers life histories of common shrubs and descriptions of shrubland communities used to promote understanding of autecological principles.
Recommended: BOT 313 and RNG 341

RNG 353. WILDLAND PLANT IDENTIFICATION. (4 Credits)
Students will learn how to identify approximately 100 plant species found in wildlands of North America and Mexico. Individual plant species ecology, basic plant anatomy and identification characteristics observable only through a microscope or dissecting scope, and how to use a dichotomous key for plant ID will also be covered.
Equivalent to: RNG 253

RNG 355. DESERT WATERSHED MANAGEMENT. (4 Credits)
A systems-based understanding of hydrologic processes in arid and semiarid landscapes. The class is focused on gaining knowledge of multiple ecological and hydrological interactions occurring in dryland watersheds and on discussing practical methodology aimed to enhance site productivity and ecosystem resilience. Emphasis is placed on land use effects on watershed function; monitoring of soil, water, and vegetation variables; and methods of rehabilitation of degraded landscapes. The course has a strong experiential learning component through a series of ‘hands-on’ practicums and a field trip to a semiarid location in eastern Oregon. Lec/lab.

RNG 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for a total of 16 credits.
This course is repeatable for 16 credits.

RNG 403. SENIOR THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 411. ADVANCED PLANT ID. (2 Credits)
Advanced rangeland plant taxonomy.
This course is repeatable for 16 credits.

Rangeland Ecology & Management

RNG 121. INTRODUCTION TO WILDLAND ECOLOGY. (4 Credits)
Ecological principles will be applied to understand contemporary issues related to wildlands, specifically the rangeland biomes that comprises over 50% of the Earth’s surface (FAO, SRM, USDA ERS). Topics to be covered fall into the following categories: Fundamentals of Ecology; Animals (wildlife & livestock); Disturbance (e.g., invasive species, fire, mineral extraction, etc.); Ecosystem Goods & Services (e.g., carbon sequestration, watersheds, biodiversity; recreation, etc.). The course will largely focus on U.S. wildlands, however a portion will examine the ecology and issues of international rangelands in Africa, Eurasia, Australia, and South America. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

RNG 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: RNG 299H
This course is repeatable for 16 credits.

RNG 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: RNG 299
This course is repeatable for 16 credits.
RNG 421. WILDLAND RESTORATION AND ECOLOGY. (4 Credits)
Emphasis is placed on understanding the ecology of arid and semi-arid ecosystems through the study of ecological processes responsible for ecosystem function. Range improvement practices for stabilizing and repairing degraded rangelands by directing autogenic recovery mechanisms are discussed. This involves manipulating plants, soil, animals and microenvironments for improved ecosystem function.
Recommended: Course work in soils and ecology

RNG 441. RANGELAND ANALYSIS. (4 Credits)
Techniques used to describe vegetation in shrub-lands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods.
Recommended: ST 351 or ST 351H

RNG 442. RANGELAND-ANIMAL RELATIONS. (4 Credits)
Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiography, and their effects on management of rangeland-animal resources.

RNG 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. Crosslisted as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 448, CROP 448

RNG 455. RIPARIAN ECODYNAMICS AND MANAGEMENT. (4 Credits)
A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).
Recommended: RNG 355

RNG 457. HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT. (3 Credits)
Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.
Prerequisites: FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D] or ST 351 [D-])

RNG 458. HABITAT ANALYSIS 2: ABUNDANCE, OCCUPANCY AND DEMOGRAPHY. (3 Credits)
Habitat influences abundance, occupancy, and demographic rates of wildlife. Wildlife management is often a component of land management and both benefit from land stewards that have an understanding of how habitat characteristics influence the occupancy, abundance, and performance of wildlife within an area. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on abundance, occupancy, and demographic rates of terrestrial animals.
Prerequisites: FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D] or ST 351 [D-])

RNG 470. PASTORAL SYSTEMS OF THE WORLD. (4 Credits)
Description and evaluation of ecosystems which support grazing animals and pastoralists. Biology, ecology and management of these landscapes will be explored through climate, soils, and plant communities and human-livestock interactions. The historic role of trade and contemporary challenges to the ecological, social and economic sustainability of pastoral systems will be examined.

RNG 490. RANGELAND MANAGEMENT PLANNING. (4 Credits)
Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints affecting decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required. Lec/lab.

RNG 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 503. MASTER'S THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

RNG 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 507. SEMINAR. (1-2 Credits)
This course is repeatable for 16 credits.

RNG 521. WILDLAND RESTORATION AND ECOLOGY. (4 Credits)
Emphasis is placed on understanding the ecology of arid and semi-arid ecosystems through the study of ecological processes responsible for ecosystem function. Range improvement practices for stabilizing and repairing degraded rangelands by directing autogenic recovery mechanisms are discussed. This involves manipulating plants, soil, animals and microenvironments for improved ecosystem function.

RNG 541. RANGELAND ANALYSIS. (4 Credits)
Techniques used to describe vegetation in shrub-lands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods.
Recommended: ST 351

RNG 542. RANGELAND-ANIMAL RELATIONS. (4 Credits)
Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiography, and their effects on management of rangeland-animal resources.
Recommended: RNG 341
RNG 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 548, CROP 548

RNG 555. RIPARIAN ECODYNAMICS AND MANAGEMENT. (4 Credits)
A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).
Recommended: RNG 355

RNG 557. HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT. (3 Credits)
Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.
Recommended: ST 511 and ST 512

RNG 558. HABITAT ANALYSIS 2: ABUNDANCE, OCCUPANCY AND DEMOGRAPHY. (3 Credits)
Habitat influences abundance, occupancy, and demographic rates of wildlife. Wildlife management is often a component of land management and both benefit from land stewards that have an understanding of how habitat characteristics influence the occupancy, abundance, and performance of wildlife within an area. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on abundance, occupancy, and demographic rates of terrestrial animals.

RNG 577. AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/NR 477 and FES 577/RNG 577.
Equivalent to: FES 577, FS 577, NR 577
Recommended: Introductory course in biology.

RNG 590. RANGELAND MANAGEMENT PLANNING. (4 Credits)
Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints necessary for decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required. Lec/lab.

RNG 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 603. PH.D. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

RNG 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 607. SEMINAR. (1-2 Credits)
This course is repeatable for 16 credits.

RNG 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 643. WILDLAND PLANT ECOPHYSIOLOGY. (4 Credits)
Emphasizes the physiological ecology of plants living in arid and semiarid ecosystems. Primary class emphasis will include photosynthesis, respiration, water stress and water use efficiency, stable isotopes, root structure and function, nutrient uptake and stress, and defoliation. Offered every other winter, odd years.

RNG 662. RANGELAND ECOLOGY. (3 Credits)
Studies ecological theory and related resource management implications in rangelands and arid wildlands. Topics include the history and development of rangeland ecology, plant demography, invasive species, plant population dynamics, disturbance theory, succession, vegetation classification and range condition assessments. Offered every other winter, even years.
Recommended: Basic ecology course

RNG 670. ECOLOGICAL INVASIVE PLANT MANAGEMENT. (2 Credits)

RNG 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Animal Science Graduate Major (MS, PhD)

Graduate Areas of Concentration
Animal nutrition, dairy production (MS only), embryo physiology, endocrinology, growth and development, livestock management (MS only), nutritional biochemistry, reproductive physiology

The Department of Animal and Rangeland Sciences offers graduate work leading to Master of Science and Doctor of Philosophy degrees in Animal Science with concentrations listed above.

Major Code: 1250

Animal Science Graduate Minor
Minor Code: 1250

Animal Sciences Minor
Also available at LaGrande and via Ecampus.
Animal Sciences Undergraduate Major (BS, HBS)

Programs in animal sciences provide up-to-date information on methods of rearing livestock and poultry, that produce meat, milk, eggs, wool, and other animal products. In addition, the department addresses the care of animals that enhance human well-being through companionship, recreation, and human aid such as horses and companion animals. Essential to this information is knowledge generated from the fields of animal behavior/bioethics, genetics, nutrition, and physiology. The various teaching and research programs explore modern areas of animal biotechnology and data processing and how they apply to present day livestock and poultry production. Study in these areas provides the core around which various curricula leading to the BS degree in Animal Sciences can be developed. To allow students flexibility in course arrangement, three specialized program options are offered.

Increasing demands for livestock and poultry products by a rapidly expanding human population mean potential employment for well-trained individuals in such areas as farm, ranch, feedlot operation; meat, poultry, egg and milk processing, meat grading with the USDA; Federal Cooperative Extension Service, county and 4-H work; sales or technical employment with commercial feed, seed, and chemical companies and pharmaceutical houses; agricultural loan officer; government agency positions at local, state and federal levels; the Peace Corps; animal welfare auditing; as well as in journalism, mass media, and public policy. The expanding support structure for companion animals has created a growing job market for graduates in areas such as animal behavior consultant; veterinary technician (animal nurse); and business management. In addition, students become prepared to go on to advanced studies in animal sciences, veterinary medicine, and education.

Graduate students may pursue research projects through the Agricultural Experiment Station as part of their programs for MS or PhD degrees. Graduate areas of concentration are offered in animal nutrition, dairy production, embryo physiology, endocrinology, ethology, growth and development, livestock management, muscle biology and meat science, nutritional biochemistry, reproductive physiology.

Cooperative Programs
Students transferring after one or two years at a community college should also be able to complete the requirements for a BS after three or two years, respectively.

Rangeland Resource Management
Rangeland resource management is one of the family of natural resources professions important to the social, economic, and political development of Oregon, the nation, and the world. It is based upon ecological principles and is concerned with the restoration, improvement, conservation, and use of rangelands. Since range management is practiced on lands producing domestic and wild animals, timber, water, and recreation, concepts of integrated land use are included in the curriculum. A balance of soil, domestic animal, wildlife, ecology, and other biological sciences is realized in the educational program.

The curriculum includes university and departmental requirements for the BS degree and provides emphasis either in science, management, ecology, or allied disciplines. The BS degree is also offered on the campus of Eastern Oregon University at La Grande through an extension of the OSU Department of Animal and Rangeland Sciences. Facilities for study include classroom and field-oriented educational environments both on-campus and at locations throughout Oregon. Field trips are taken in conjunction with specific courses.

Graduate work leading to MAIS, MS, or PhD degrees may involve research on domestic or wild animals, rangeland nutrition, community ecology, physiology of rangeland plants, rangeland improvement, rangeland watershed, and riparian zone management, rangeland restoration, utilization and management, agroforestry and landscape ecology.

Summer employment with private industry, government agencies, and on range research projects makes possible learning experiences while earning a salary. Employment opportunities include resource management, research, Extension, ranch management, college and university teaching, business and industrial activities related to rangeland resources, and foreign agricultural and resource development assistance.

The Department of Animal and Rangeland Sciences is accredited by the Society for Range Management. It is recognized throughout the country as one of the leading institutions of rangeland management.

Major Code: 125

Departmental requirements may be utilized to satisfy baccalaureate core and non-departmental minor requirements.

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<td>Skills Courses</td>
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<td>Fitness</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<td>HHS 241</td>
<td>*LIFETIME FITNESS (or PAC course)</td>
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<td>Mathematics</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION (Must be taken in first 45 credits)</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
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<td>Biological Science (Lecture/Lab)</td>
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<td>Cultural Diversity (CD)</td>
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<td>Literature and the Arts (LA)</td>
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<td>Physical Science (Lecture/Lab or Lab)</td>
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<td>Social Processes and Institutions (SPI)</td>
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<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY (recommended)</td>
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<td>or ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
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<td>Western Culture (WC)</td>
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<td>Difference, Power, and Discrimination (DPD)</td>
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Synthesis Courses
Select one of the following chemistry groups: 15

**Group A**

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<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
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<td>&amp; CH 123</td>
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**Group B**

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<tr>
<td>or BB 331</td>
<td>*INTRODUCTION TO MOLECULAR BIOLOGY</td>
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</tr>
<tr>
<td>MB 230</td>
<td>*INTRODUCTORY MICROBIOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

**MTH 111**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Statistics**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>or ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td></td>
</tr>
</tbody>
</table>

**Business**

Select one course from the following: 3-4

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC 211</td>
<td>AGRICULTURAL AND FOOD MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>AEC 221</td>
<td>AGRICULTURAL AND FOOD MARKETING</td>
<td></td>
</tr>
<tr>
<td>AEC 388</td>
<td>AGRICULTURAL LAW</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours** 180

* Baccalaureate Core Course

* Writing Intensive Course (WIC)

1. Please reference the baccalaureate core course catalog (p. 1614) for a list of approved courses

2. No more than two courses (or lecture/lab combinations) from any one department may be used by a student to satisfy the Perspectives category of the core.

3. The two courses used to fulfill the Synthesis requirement may not be in the same department.
Animal Behavior Option

This option is offered within the following major(s):

• Animal Sciences - College of Agricultural Sciences (p. 64)

The Animal Behavior option will provide students with skills necessary to enter professions or graduate studies related to animal behavior and welfare, service and therapy with animals, or other animal care or industry positions that include a behavior management component. Courses chosen are consistent with accepted curriculum for animal behaviorists and provide a solid foundation to those working towards related certifications.

Option Code: 707

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 341</td>
<td>ANIMAL BEHAVIOR AND COGNITION</td>
<td>3</td>
</tr>
<tr>
<td>ANS 435</td>
<td>APPLIED ANIMAL BEHAVIOR</td>
<td>3</td>
</tr>
<tr>
<td>ANS 441</td>
<td>TOPICS IN ANIMAL LEARNING</td>
<td>3</td>
</tr>
<tr>
<td>PSY 201</td>
<td>*GENERAL PSYCHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>PSY 201</td>
<td>RESEARCH METHODS IN PSYCHOLOGY</td>
<td>3-4</td>
</tr>
<tr>
<td>PSY 330</td>
<td>BRAIN AND BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>PSY 340</td>
<td>COGNITION</td>
<td>3</td>
</tr>
<tr>
<td>PSY 342</td>
<td>PHYSIOLOGICAL PSYCHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>PSY 454</td>
<td>COGNITIVE DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>PSY 456</td>
<td>SOCIAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
<td>3</td>
</tr>
<tr>
<td>Z 350</td>
<td>ANIMAL BEHAVIOR</td>
<td>4</td>
</tr>
</tbody>
</table>

Select at least 6 credits of the following:

- ANS 401 RESEARCH
- ANS 410 ANIMAL SCIENCE INTERNSHIP
- FW 328/VMB 328 WILDLIFE CAPTURE AND IMMOBILIZATION
- FW 475 WILDLIFE BEHAVIOR
- FW 481 WILDLIFE ECOLOGY
- PSY 340 COGNITION
- PSY 454 COGNITIVE DEVELOPMENT
- PSY 456 SOCIAL DEVELOPMENT
- RNG 442 RANGELAND-ANIMAL RELATIONS
- Z 350 ANIMAL BEHAVIOR

Total Hours: 28-29

1 Research and/or internship must be related to the field of animal behavior

* Baccalaureate Core Course

Animal BioHealth/Pre-Professional Option

This option is offered within the following major(s):

• Animal Sciences - College of Agricultural Sciences (p. 64)

The Animal BioSciences/Pre-Professional option prepares students for professional careers in veterinary medicine, and animal science teaching
and research. Extensive training is provided in the biological and physical sciences, offering an excellent foundation for graduate study. Requirements include the core curriculum and additional credits as required by the College of Veterinary Medicine. The Animal BioSciences/Pre-Professional option is designed for students interested in fulfilling requirements for admission to the OSU College of Veterinary Medicine. It allows students who are admitted to the college, upon completion of three years of undergraduate study, to apply credit earned during the first three years of professional study toward the BS degree in Animal Sciences.

Students choosing not to attend veterinary school after the third year of this program may complete additional requirements to qualify for the BS degree in Animal Sciences.

**Option Code: 709**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required</strong></td>
<td></td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>7</td>
</tr>
<tr>
<td>&amp; BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
<td>8</td>
</tr>
<tr>
<td>&amp; CH 332</td>
<td>ORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>MB 230</td>
<td>*INTRODUCTORY MICROBIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
<td>4</td>
</tr>
<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
<td>10</td>
</tr>
<tr>
<td>&amp; PH 202</td>
<td>*GENERAL PHYSICS</td>
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<tr>
<td>Select 6-7 credits from the following:</td>
<td>6-7</td>
<td></td>
</tr>
<tr>
<td>ANS 380</td>
<td>PRINCIPLES OF ANIMAL ANATOMY AND PHYSIOLOGY</td>
<td></td>
</tr>
<tr>
<td>ANS 385</td>
<td>FOUNDATIONS OF MAMMALIAN HISTOLOGY</td>
<td></td>
</tr>
<tr>
<td>ANS 390</td>
<td>GROSS ANATOMY OF DOMESTIC ANIMALS</td>
<td></td>
</tr>
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<td></td>
<td><strong>Total Hours</strong></td>
<td>47-48</td>
</tr>
</tbody>
</table>

- Baccalaureate Core Course (BCC)

1. These courses may be double counted in the upper-division Animal Sciences courses

**Option Code: 709**

**Animal Production Option**

This option is offered within the following major(s):

- Animal Sciences - College of Agricultural Sciences (p. 64)

The Animal Production option will allow students to select a species or production industry that interests them most. This option is for students that want to specialize in breeding, feeding, care, and welfare of animals. Animal production, nutrition, and management classes combined with business and/or applied economics courses provide a solid basis for a career in industry-level positions that pertain to animal management and production.

**Option Code: 708**

At least 15 credits in the option must be upper division.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required</strong></td>
<td></td>
</tr>
<tr>
<td>ANS 231</td>
<td>LIVESTOCK EVALUATION</td>
<td>3</td>
</tr>
<tr>
<td>ANS 251</td>
<td>PRINCIPLES OF ANIMAL FOODS TECHNOLOGY</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Animal Industry</strong></td>
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</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Equine Option**

This option is offered within the following major(s):

- Animal Sciences - College of Agricultural Sciences (p. 64)

The two areas of emphasis within the Equine option are designed to give students direction in regard to their future career and endeavors.

The Management or General Emphasis is designed to prepare those students wanting to not only own horses, but to manage equine facilities, event centers, or to go into areas such as nutrition, pharmaceuticals sales or marketing and promotion.

The Human or Animal Therapy Emphasis is designed to prepare students to go into the area of animal-assisted therapy. Using horses as therapy animals is becoming widely accepted and utilized. For this emphasis, the student not only needs to understand the horse itself but human nature as well.

**Option Code: 693**
27 credits with a minimum of 15 credits upper division are required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 220</td>
<td>INTRODUCTORY HORSE SCIENCE</td>
<td>3</td>
</tr>
<tr>
<td>ANS 333</td>
<td>EQUINE STABLE MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>ANS 335</td>
<td>EQUINE HEALTH AND DISEASE</td>
<td>3</td>
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</table>

Select one of the following: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 341</td>
<td>ANIMAL BEHAVIOR AND COGNITION</td>
<td></td>
</tr>
<tr>
<td>ANS 435</td>
<td>APPLIED ANIMAL BEHAVIOR</td>
<td></td>
</tr>
<tr>
<td>ANS 441</td>
<td>TOPICS IN ANIMAL LEARNING</td>
<td></td>
</tr>
</tbody>
</table>

Select two of the following (you may take all): 6-7

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ANS 430</td>
<td>EQUINE SYSTEMS I: EXERCISE SCIENCE</td>
<td></td>
</tr>
<tr>
<td>ANS 431</td>
<td>EQUINE SYSTEMS II: NUTRITION</td>
<td></td>
</tr>
<tr>
<td>ANS 432</td>
<td>EQUINE SYSTEMS III: REPRODUCTION</td>
<td></td>
</tr>
</tbody>
</table>

Select a minimum of 9 credits from one of the following groups: 9

Group A: Management or General Emphasis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 223</td>
<td>EQUINE MARKETING</td>
<td></td>
</tr>
<tr>
<td>ANS 401</td>
<td>RESEARCH</td>
<td></td>
</tr>
<tr>
<td>ANS 410</td>
<td>ANIMAL SCIENCE INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>BA 215</td>
<td>FUNDAMENTALS OF ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td></td>
</tr>
<tr>
<td>or AEC 388</td>
<td>AGRICULTURAL LAW</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td></td>
</tr>
<tr>
<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
<td></td>
</tr>
<tr>
<td>or CROP 310</td>
<td>FORAGE PRODUCTION</td>
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</tr>
<tr>
<td>RNG 470</td>
<td>PASTORAL SYSTEMS OF THE WORLD</td>
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</tbody>
</table>

Group B: Human or Animal Therapy Emphasis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 341</td>
<td>ANIMAL BEHAVIOR AND COGNITION</td>
<td></td>
</tr>
<tr>
<td>ANS 401</td>
<td>RESEARCH</td>
<td></td>
</tr>
<tr>
<td>ANS 410</td>
<td>ANIMAL SCIENCE INTERNSHIP</td>
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</tr>
<tr>
<td>ANS 435</td>
<td>APPLIED ANIMAL BEHAVIOR</td>
<td></td>
</tr>
<tr>
<td>ANS 441</td>
<td>TOPICS IN ANIMAL LEARNING</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td></td>
</tr>
<tr>
<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
<td></td>
</tr>
<tr>
<td>PSY 201</td>
<td>*GENERAL PSYCHOLOGY</td>
<td></td>
</tr>
<tr>
<td>PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
<td></td>
</tr>
<tr>
<td>PSY 330</td>
<td>BRAIN AND BEHAVIOR</td>
<td></td>
</tr>
<tr>
<td>PSY 381</td>
<td>ABNORMAL PSYCHOLOGY</td>
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</tr>
<tr>
<td>PSY 432</td>
<td>PHYSIOLOGICAL PSYCHOLOGY</td>
<td></td>
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</table>

Total Hours 27-28

Option Code: 712

28 credits are required for the option; 15 of which must be at the upper-division level.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 435</td>
<td>APPLIED ANIMAL BEHAVIOR</td>
<td></td>
</tr>
<tr>
<td>ANS 436</td>
<td>SHEEP PRODUCTION SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>ANS 445</td>
<td>BEEF PRODUCTION SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>RNG 355</td>
<td>DESERT WATERSHED MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>or RNG 441</td>
<td>RANGELAND ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
<td></td>
</tr>
<tr>
<td>RNG 490</td>
<td>RANGELAND MANAGEMENT PLANNING</td>
<td></td>
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</table>

Prerequisites and/or Other Recommended Course Work

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 215</td>
<td>BEEF/DAIRY INDUSTRIES (Prerequisite for ANS 445)</td>
<td></td>
</tr>
<tr>
<td>ANS 216</td>
<td>SMALL RUMINANT/SWINE INDUSTRIES (Prerequisite for ANS 436)</td>
<td></td>
</tr>
<tr>
<td>RNG 353</td>
<td>WILDLAND PLANT IDENTIFICATION</td>
<td></td>
</tr>
<tr>
<td>RNG 455</td>
<td>RIPARIAN ECOHYDROLOGY AND MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>RNG 470</td>
<td>PASTORAL SYSTEMS OF THE WORLD</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 29

Option Code: 712

**Rangeland Ecology and Management Graduate Major (MS, PhD)**

**Graduate Areas of Concentration**

Agronomy, ecology of rangelands, physiology of range plants, range improvement, range nutrition, restoration ecology, riparian zone management, watershed management

The Department of Animal and Rangeland Sciences offers Master of Science and Doctor of Philosophy degrees.

The program integrates plant, soil, and animal sciences to prepare degree candidates for leadership in this professional field. Under the guidance of the rangeland faculty, graduate students study rangeland ecology, physiology of rangeland plants, rangeland nutrition, rangeland improvements, watershed management, restoration ecology, agroforestry, water quality, and riparian zone management. Through the Department of Animal and Rangeland Sciences, range management graduate students have access to greenhouse, field plot, pasture, range, and animal facilities on campus, and at the two Eastern Oregon Agricultural Research Center stations at Union and Burns.

Graduate students in rangeland ecology and management may select courses in complementary areas, including agricultural and resource economics, fisheries and wildlife, botany, soils, statistics, biology forestry, crop science, and animal science. The selection of these complementary areas depends on the interest of the students, their aptitude, and the thesis topic they have chosen. Minors are commonly elected in botany, soils, forage crops, animal nutrition, fisheries and wildlife, agricultural and resource economics, or in an integrated program of study.
Rangeland Ecology and Management Graduate Minor

Completion of the Rangeland Ecology and Management minor alone does not qualify students for rangeland conservationist positions with the U.S. Office of Personnel Management (OPM).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>RNG 351</td>
<td>RANGE ECOLOGY I-GRASSLANDS</td>
<td>3</td>
</tr>
<tr>
<td>RNG 352</td>
<td>RANGE ECOLOGY II-SHRUBLANDS</td>
<td>3</td>
</tr>
<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
<td>4</td>
</tr>
<tr>
<td>RNG 490</td>
<td>RANGELAND MANAGEMENT PLANNING</td>
<td>4</td>
</tr>
</tbody>
</table>

Select seven credits from the following:
- Any other RNG course
- ANS 436 SHEEP PRODUCTION SYSTEMS
- ANS 443 BEEF PRODUCTION SYSTEMS: COW/CALF
- BOT 341 PLANT ECOLOGY

Total Hours: 28

Rangeland Ecology and Management Minor

Completion of the Rangeland Ecology and Management minor alone does not qualify students for rangeland conservationist positions with the U.S. Office of Personnel Management (OPM).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>RNG 351</td>
<td>RANGE ECOLOGY I-GRASSLANDS</td>
<td>3</td>
</tr>
<tr>
<td>RNG 352</td>
<td>RANGE ECOLOGY II-SHRUBLANDS</td>
<td>3</td>
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<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
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<tr>
<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
<td>4</td>
</tr>
<tr>
<td>RNG 490</td>
<td>RANGELAND MANAGEMENT PLANNING</td>
<td>4</td>
</tr>
</tbody>
</table>

Select seven credits from the following:
- Any other RNG course
- ANS 436 SHEEP PRODUCTION SYSTEMS
- ANS 443 BEEF PRODUCTION SYSTEMS: COW/CALF
- BOT 341 PLANT ECOLOGY

Total Hours: 28

Rangeland Science Minor

Also available at LaGrande.

Rangeland sciences is about the study and sustainable management of landscapes across a variety of biomes, from arid deserts, to mesic grasslands, to tropical savannahs. The program takes an interdisciplinary approach to provide advanced scientific knowledge regarding multiple ecological processes and social drivers influencing rangeland ecosystems around the globe. Students gain the skills and knowledge needed to deeply understand and effectively manage rangelands for improved productivity and enhanced ecosystem resilience. The end goal is that students graduating from the program will be able to integrate contemporary rangeland ecology and management principles into a systems-based decision-making framework that promotes ecological resilience, sustainable societies, and thriving economies in socioecological rangeland ecosystems.

Completion of the Rangeland Sciences minor alone does not qualify students for rangeland conservationist positions with the U.S. Office of Personnel Management (OPM).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 121</td>
<td>*INTRODUCTION TO ANIMAL SCIENCES</td>
<td>4</td>
</tr>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>RNG 351</td>
<td>RANGE ECOLOGY I-GRASSLANDS</td>
<td>3</td>
</tr>
<tr>
<td>RNG 352</td>
<td>RANGE ECOLOGY II-SHRUBLANDS</td>
<td>3</td>
</tr>
<tr>
<td>RNG 355</td>
<td>DESERT WATERSHIP MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>RNG 441</td>
<td>RANGELAND MANAGEMENT PLANNING</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours: 28

Rangeland Sciences Undergraduate Major (BS, HBS)

Also available at LaGrande and via Ecampus.

Rangeland sciences is about the study and sustainable management of rangelands across a variety of biomes, from arid deserts, to mesic grasslands, to tropical savannahs. The program takes an interdisciplinary approach to provide advanced scientific knowledge regarding multiple ecological processes and social drivers influencing rangeland ecosystems around the globe. Students gain the skills and knowledge needed to deeply understand and effectively manage rangelands for improved productivity and enhanced ecosystem resilience. The end goal is that students graduating from the program will be able to integrate contemporary rangeland ecology and management principles into a systems-based decision-making framework that promotes ecological resilience, sustainable societies, and thriving economies in socioecological rangeland ecosystems.

Major Code: 292

Departmental requirements may be utilized to satisfy baccalaureate core and non-departmental minor requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 121</td>
<td>*INTRODUCTION TO ANIMAL SCIENCES</td>
<td>4</td>
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<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
<td>3</td>
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<td>RNG 351</td>
<td>RANGE ECOLOGY I-GRASSLANDS</td>
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<td>RNG 352</td>
<td>RANGE ECOLOGY II-SHRUBLANDS</td>
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<td>RNG 355</td>
<td>DESERT WATERSHIP MANAGEMENT</td>
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<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
<td>4</td>
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<tr>
<td>RNG 441</td>
<td>RANGELAND ANALYSIS</td>
<td>4</td>
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</tbody>
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Total Hours: 28
Synthesis Courses 4

Contemporary Global Issues (CGI)
Science, Technology, and Society (STS)
Writing Intensive Course (WIC)

Select one course from the following:
AG 421 *WRITING IN AGRICULTURE
ANS 420 *ETHICAL ISSUES IN ANIMAL AGRICULTURE
ENSC 479 **ENVIRONMENTAL CASE STUDIES
FW 435 *WILDLIFE IN AGRICULTURAL ECOSYSTEMS

Rangeland Science Base Program

Fundamentals of Rangeland Ecology
RNG 121 *INTRODUCTION TO WILDLAND ECOLOGY 4
RNG 341 RANGELAND ECOLOGY AND MANAGEMENT 3
RNG 351 RANGE ECOLOGY I-GRASSLANDS 3
RNG 352 RANGE ECOLOGY II-SHRUBLANDS 3

Methods and Management
RNG 421 WILDLAND RESTORATION AND ECOLOGY 4
RNG 441 RANGELAND ANALYSIS 4
RNG 442 RANGELAND-ANIMAL RELATIONS 4
RNG 490 RANGELAND MANAGEMENT PLANNING 4

Plants
BOT 331 PLANT PHYSIOLOGY 4
BOT 341 PLANT ECOLOGY 4
RNG 353 WILDLAND PLANT IDENTIFICATION 4

Soil
Select one of the following options: 4
SOIL 205 SOIL SCIENCE
& SOIL 206 and *SOIL SCIENCE LABORATORY FOR SOIL 205
CSS 205 *SOIL SCIENCE

Select one course from the following: 3
SOIL 366 ECOSYSTEMS OF WILDLAND SOILS
SOIL 466 SOIL MORPHOLOGY AND CLASSIFICATION

Water
RNG 355 DESERT WATERSHED MANAGEMENT 4
RNG 455 RIPARIAN ECOHYDROLOGY AND MANAGEMENT 4

Socio-Economic
Select one course from the following: 3
AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY

Select one course from the following: 4
ANTH 466 *RURAL ANTHROPOLOGY
SOC 381 SOCIAL DIMENSIONS OF SUSTAINABILITY
SOC 475 RURAL SOCIOLOGY
SOC 480 *ENVIRONMENTAL SOCIOLOGY
SOC 481 *SOCIETY AND NATURAL RESOURCES

Animals
ANS 313 APPLIED ANIMAL NUTRITION: FEEDS AND RATION FORMULATION 4

Select one course from the following:
ANS 436 SHEEP PRODUCTION SYSTEMS
ANS 445 BEEF PRODUCTION SYSTEMS
ANS 446 GRAZING LIVESTOCK PRODUCTION
ANS 448/CROP 448/RNG 448 LIVESTOCK PRODUCTION ON PASTURE

Other Animals
FW 255 FIELD SAMPLING OF FISH AND WILDLIFE 3
RNG 457 HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT 3

General Science, Math and Statistics
Select one of the following biology groups: 12
BI 211 *PRINCIPLES OF BIOLOGY
& BI 212 and *PRINCIPLES OF BIOLOGY
& BI 213 and *PRINCIPLES OF BIOLOGY

Option or Minor
Select one of four Rangeland Sciences options or a minor of your choice 27-32

Total Hours 180

* Baccalaureate Core Course
^ Writing Intensive Course (WIC)

1 Certain classes may be used to satisfy both the baccalaureate core and the rangeland ecology and management core
2 No more than two courses (or lecture/lab combinations) from any one department may be used by a student to satisfy the Perspectives category of the core
3 Please reference the baccalaureate core course catalog (p. 1614) for a list of approved courses
4 The two courses used to fulfill the Synthesis requirement may not be in the same department

Major Code: 292

Sample On-Campus 4 Year Plan

Course Title Hours

First Year
Fall
WR 121 *ENGLISH COMPOSITION 3
CH 121 GENERAL CHEMISTRY 5
HHS 231 *LIFETIME FITNESS FOR HEALTH 2
or HHS 241 or *LIFETIME FITNESS
RNG 121 *INTRODUCTION TO WILDLAND ECOLOGY 4

Hours 14

Winter
COMM 111 *PUBLIC SPEAKING (Bacc Core) 3
or COMM 114 or *ARGUMENT AND CRITICAL DISCOURSE 3
or COMM 218 or *INTERPERSONAL COMMUNICATION
CH 122 *GENERAL CHEMISTRY 5
MTH 111 *COLLEGE ALGEBRA 4
Bacc Core: Lit. & Arts 3

Hours 15

Spring
Bacc Core: Western Cult ure 3
AEC 250 *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY (Bacc Core SPI) 3
CH 123 *GENERAL CHEMISTRY 5
SOIL 205 SOIL SCIENCE
& SOIL 206 and *SOIL SCIENCE LABORATORY FOR SOIL 205 4

Hours 15

Second Year
Fall
BI 211 *PRINCIPLES OF BIOLOGY 4
Bacc Core: Cultural Diversity 3
MTH 241 *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE 4
RNG 341 RANGELAND ECOLOGY AND MANAGEMENT 3
Elective/Option/Minor 2

Hours 16
| Winter | BI 212 *PRINCIPLES OF BIOLOGY | 4 |
| Winter | WR 327 *TECHNICAL WRITING (Bacc Core) | 3 |
| Winter | BOT 331 PLANT PHYSIOLOGY | 4 |
| Winter | ST 201 PRINCIPLES OF STATISTICS or ST 351 INTRODUCTION TO STATISTICAL METHODS | 4 |
| Winter | BI 213 *PRINCIPLES OF BIOLOGY | 4 |
| Winter | Bacc Core DPD | 3 |
| Winter | BOT 341 PLANT ECOLOGY | 4 |
| Winter | RNG 353 WILDLAND PLANT IDENTIFICATION | 4 |
| Third Year | Fall | ANS 445 BEEF PRODUCTION SYSTEMS | 4 |
| Third Year | Fall | ANS 351 *NATURAL RESOURCE ECONOMICS AND POLICY (Bacc Core Global) | 3 |
| Third Year | Fall | FW 251 PRINCIPLES OF FISH AND WILDLIFE CONSERVATION | 3 |
| Third Year | Fall | RNG 352 RANGE ECOLOGY II-SHRUBLANDS | 3 |
| Third Year | Fall | RNG 442 RANGELAND-ANIMAL RELATIONS | 4 |
| Third Year | Winter | CH 122 *GENERAL CHEMISTRY | 5 |
| Third Year | Winter | MTH 111 *COLLEGE ALGEBRA | 4 |
| Third Year | Winter | Bacc Core: Lit. & Arts | 3 |
| Winter | BI 204 *INTRODUCTORY BIOLOGY I | 4 |
| Winter | BI 205 *INTRODUCTORY BIOLOGY II | 4 |
| Winter | BI 206 *INTRODUCTORY BIOLOGY III | 4 |
| Winter | RNG 490 RANGELAND MANAGEMENT PLANNING | 4 |
| Winter | RNG 441 RANGELAND ANALYSIS | 4 |
| Winter | RNG 442 RANGELAND-ANIMAL RELATIONS | 4 |
| Winter | SOIL 366 ECOSYSTEMS OF WILDLAND SOILS | 3 |
| Winter | AG 421 *WRITING IN AGRICULTURE or ANS 420 or FW 435 *ETHICAL ISSUES IN ANIMAL AGRICULTURE or *WILDLIFE IN AGRICULTURAL ECOSYSTEMS | 3 |
| Winter | RNG 446 GRAZING LIVESTOCK PRODUCTION | 4 |
| Winter | RNG 352 RANGE ECOLOGY II-SHRUBLANDS | 3 |
| Winter | RNG 442 RANGELAND-ANIMAL RELATIONS | 4 |
| Winter | SOIL 366 ECOSYSTEMS OF WILDLAND SOILS | 3 |
| Spring | BI 213 *PRINCIPLES OF BIOLOGY | 4 |
| Spring | Bacc Core: Western Culture | 3 |
| Spring | AEC 250 *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY (Bacc Core SPI) | 3 |
| Spring | CH 123 *GENERAL CHEMISTRY | 5 |
| Spring | CSS 205 *SOIL SCIENCE | 4 |
| Spring | BI 204 *INTRODUCTORY BIOLOGY I | 4 |
| Spring | WR 327 *TECHNICAL WRITING (Bacc Core) | 3 |
| Spring | BOT 331 PLANT PHYSIOLOGY | 4 |
| Spring | ST 201 PRINCIPLES OF STATISTICS or ST 351 INTRODUCTION TO STATISTICAL METHODS | 4 |
| Spring | BI 205 *INTRODUCTORY BIOLOGY II | 4 |
| Spring | RNG 441 RANGELAND ANALYSIS | 4 |
| Spring | RNG 446 GRAZING LIVESTOCK PRODUCTION | 4 |
| Spring | RNG 352 RANGE ECOLOGY II-SHRUBLANDS | 3 |
| Spring | RNG 442 RANGELAND-ANIMAL RELATIONS | 4 |
| Spring | SOIL 366 ECOSYSTEMS OF WILDLAND SOILS | 3 |
| Spring | ANS 446 GRAZING LIVESTOCK PRODUCTION | 4 |
| Spring | RNG 352 RANGE ECOLOGY II-SHRUBLANDS | 3 |
| Spring | RNG 355 DESERT WATERSHED MANAGEMENT | 4 |
| Spring | RNG 490 RANGELAND MANAGEMENT PLANNING | 4 |
| Spring | RNG 441 RANGELAND ANALYSIS | 4 |
| Spring | ANS 446 GRAZING LIVESTOCK PRODUCTION | 4 |
| Spring | RNG 352 RANGE ECOLOGY II-SHRUBLANDS | 3 |
| Spring | RNG 442 RANGELAND-ANIMAL RELATIONS | 4 |
| Spring | SOIL 366 ECOSYSTEMS OF WILDLAND SOILS | 3 |
| Total Hours | | 179 |
Habitat Management Option

This option is offered within the following major(s):

- Rangeland Sciences - College of Agricultural Sciences (p. 69)

Habitat management is about land management, which is the focus of Rangeland Sciences. In this option students will learn how to analyze and manage the complex ecology of an area for multi-species habitat in the face of disturbance and multiple uses.

Student Learning Outcomes

- Evaluate quantity and quality of habitat with focus on habitat availability throughout life history stages; and with emphasis on multi-season habitat use
- Understand effects of complex interactions of disturbance on ecosystem function related to habitat use and demography.
- Understand how social pressures relate to habitat and develop mitigation actions to reduce conflict at the human-wildlife interface.
- Identify and monitor habitat restoration activities with focus on determination of success as increased habitat use and demographic rates.

Option Code: 853

Pastoral Systems of the World Option

This option is offered within the following major(s):

- Rangeland Sciences - College of Agricultural Sciences (p. 69)

Rangeland biomes (grasslands, shrublands, deserts and woodland savannas) comprise approximately 50% of the terrestrial surface of the earth. Pastoral cultures and livelihoods remain dominant on rangelands. This option will provide students with an opportunity to not only learn about pastoral systems worldwide, but also social, cultural, economic and political factors of regions worldwide that influence pastoral livelihoods. Students in this option are strongly encouraged to study abroad.

Student Learning Outcomes

- Compare and contrast pastoral systems worldwide; and to US ranching systems
- Identify social, cultural, economic, and political factors that affect the success of people living on rangeland landscapes worldwide
- Outline driving components of regional pastoral sustainability efforts to balance ecology and livelihoods
- Design a sustainable grazing management plan for a chosen pastoral system that reflects local social, cultural, economic and political factors.

Possible Career Paths

Graduates in this option will be positioned to pursue career paths with international NGOs, the US Foreign Service, United Nations programs, or bring an international pastoral systems perspective to managing livestock grazing in the US.

Option Code: 852
GEOG 311 *GEOGRAPHY OF AFRICA
GEOG 313 *GEOGRAPHY OF ASIA
GEOG 314 *GEOGRAPHY OF LATIN AMERICA

International Systems
Select 6 credits from the following: 6
AEC 243 *GLOBAL POVERTY AND SUSTAINABLE DEVELOPMENT
ANTH 482 *ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT
FCSJ 454 *INTERNATIONAL PERSPECTIVES ON FOOD SYSTEMS
GEOG 105 *GEOGRAPHY OF THE NON-WESTERN WORLD
GEOG 203 *HUMAN-ENVIRONMENT GEOGRAPHY
GEOG 330 **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION
GEOG 331 *POPULATION, CONSUMPTION, AND ENVIRONMENT
GEOG 430 *RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT
GEOG 432 *GEOGRAPHY OF FOOD AND AGRICULTURE
GEOG 441 INTERNATIONAL WATER RESOURCES MANAGEMENT
PS 345 *POLITICS OF DEVELOPING NATIONS
PS 458 *INTERNATIONAL POLITICAL ECONOMY

Natural Resource Management
Select 6 credits from the following: 6
COMM 446 *COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES
FES 355 MANAGEMENT FOR MULTIPLE RESOURCE VALUES
NR 477 *AGROFORESTRY
PS 455 *THE POLITICS OF CLIMATE CHANGE

Total Hours 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 852

Sustainable Livestock Ranching Option

This option is offered within the following major(s):
  • Rangeland Sciences - College of Agricultural Sciences (p. 69)

This option will equip students with the knowledge and skills to manage ranching operations that balance delivery of ecosystem goods and services as well as meet ranch enterprise production goals.

Student Learning Outcomes
  • Evaluate and address ecological disturbance impacts of ranch management.
  • Create and trouble-shoot sustainable grazing management plans.
  • Design a ranch management plan that balances the delivery of ecosystem goods and services with production goals.

Option Code: 850

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ANS 313</td>
<td>APPLIED ANIMAL NUTRITION: FEEDS AND RATION FORMULATION</td>
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<tr>
<td>ANS 446</td>
<td>GRAZING LIVESTOCK PRODUCTION</td>
<td>4</td>
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<tr>
<td>FW 462</td>
<td>ECOSYSTEM SERVICES</td>
<td>3</td>
</tr>
<tr>
<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
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Livestock Management

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>ANS 121</td>
<td>*INTRODUCTION TO ANIMAL SCIENCES</td>
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<tr>
<td>ANS 215</td>
<td>BEEF/DAIRY INDUSTRIES</td>
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<tr>
<td>ANS 216</td>
<td>SMALL RUMINANT/Swine Industries</td>
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<tr>
<td>ANS 316</td>
<td>REPRODUCTION IN DOMESTIC ANIMALS</td>
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<td>ANS 317</td>
<td>REPRODUCTION IN DOMESTIC ANIMALS LABORATORY</td>
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<td>ANS 378</td>
<td>ANIMAL GENETICS</td>
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<td>ANS 380</td>
<td>PRINCIPLES OF ANIMAL ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>ANS 436</td>
<td>SHEEP PRODUCTION SYSTEMS</td>
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<td>ANS 445</td>
<td>BEEF PRODUCTION SYSTEMS</td>
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<td>RNG 457</td>
<td>HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT (WILDLIFE HABITAT ANALYSIS 1)</td>
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<td>RNG 499</td>
<td>SPECIAL TOPICS</td>
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General Agriculture 6
CROP 310 FORAGE PRODUCTION
AG 312 ENGINE THEORY AND OPERATION
AG 391 FARM IMPLEMENTS
AG 412 AG SAFETY AND HEALTH

Business Management 6
AEC 211 AGRICULTURAL AND FOOD MANAGEMENT
AEC 251 *INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS
AEC 388 AGRICULTURAL LAW
AEC 442 AGRICULTURAL BUSINESS MANAGEMENT
AEC 444 COMMODITY FUTURES AND OPTIONS MARKETS
BA 314 SUSTAINABLE BUSINESS OPERATIONS

Total Hours 36

* Baccalaureate Core Course (BCC)

Option Code: 850

Sustainable Rangeland Ecosystem Stewardship Option

This option is offered within the following major(s):
  • Rangeland Sciences - College of Agricultural Sciences (p. 69)

This option will incorporate course work from a variety of disciplines to build on the knowledge areas of the base Rangeland program (plants, soil, water, animals) to deepen the student’s understanding of rangeland ecosystems and their management. This option also allows students to focus on a specific area and/or broadly bolster their knowledge.

Student Learning Outcomes
  • Assess state of ecological structure and function in the face of disturbance, then propose approaches and methods to mitigate disturbance and bolster resiliency.
  • Design a detailed ecological restoration and/or land management plan that reflects socio-economic considerations and outlines how to build stakeholder support.

Option Code: 856

27 credits are required for this option of which 15 credits must be upper division.

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<tr>
<td>BOT 442</td>
<td>PLANT POPULATION ECOLOGY</td>
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<td>BOT 488</td>
<td>ENVIRONMENTAL PHYSIOLOGY OF PLANTS</td>
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<td>FE 430</td>
<td>WATERSHED PROCESSES</td>
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<tr>
<td>FES 240</td>
<td>*FOREST BIOLOGY</td>
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The Department of Applied Economics offers the Bachelor of Science degree in Agricultural and Food Business Management and the Bachelor of Science degree in Environmental Economics and Policy. These degrees open doors to exciting careers in the traditional areas of commercial agriculture, agricultural business management, and agricultural policy, and in the newer career areas of natural resource and environmental management, marine resources, international trade and development, rural growth and change, and environmental and resource law.

The Agricultural and Food Business Management (AFBM) major prepares students for the unique challenges and opportunities in agricultural business careers. It combines economic and business principles and their application to farms and ranches, companies processing and marketing farm products, and companies supplying goods and services to farmers and other businesses. The curriculum combines skills in marketing, accounting, and economic analysis with a minor appropriate to a student's professional goals and interests.

Career Opportunities for Undergraduates
Graduates may pursue a number of attractive career opportunities. Agricultural and Food Business Management (AFBM) majors may move directly into professional jobs with agribusiness firms, financial and insurance institutions, or manage their own agribusinesses.

Apprenticeships and Other Opportunities
Opportunities also exist for ABM majors to pursue graduate studies in food and agricultural management, agricultural cooperatives, and sustainable development. Environmental Economics and Policy (EEP) students can serve effectively as members of interdisciplinary teams involved in resource and environmental management, planning, and policy analysis. Government job opportunities include management, planning, and analysis positions with federal, state, and local government agencies. Private company opportunities include similar positions with utility companies, banks, consulting firms, and resource management companies. The EEP degree also provides an excellent foundation for graduate work in economics, as well as law, public policy, and urban planning.

Applied Economics Graduate Program
The Applied Economics Graduate Program offers the MA, MS, and PhD degrees in Applied Economics. Graduates pursue academic, analytical, and policy careers in universities, consulting, trade associations, firms, and government. Core course work consists of microeconomic theory, econometrics, and other quantitative methods. Field (concentration) and elective courses include natural resources and the environment, energy, trade, economic development, marine and coastal resources, transportation, and health care. Program emphasis is on applications to real-world settings, institutions, and problems. Faculty are in the Applied Economics Department and throughout the University.
Economics Department; the Colleges of Forestry, Agricultural Sciences, and Liberal Arts; the College of Earth, Ocean, and Atmospheric Sciences; and the School of Public Health and Human Sciences.

Undergraduate Programs

Majors
• Agricultural and Food Business Management (p. 82)
• Environmental Economics and Policy (p. 83)

Minors
• Agricultural Business Management (p. 82)
• Food Economics and Policy (p. 84)
• Natural Resource and Environmental Law and Policy (p. 84)
• Resource Economics (p. 85)

Graduate Programs

Majors
• Applied Economics (p. 83)

Minors
• Applied Economics (p. 83)
• International Agricultural Development (p. 84)
• Rural Studies (p. 85)

Jennifer Alix-Garcia, Department Head
213 Ballard Extension Hall
Oregon State University
Corvallis, OR 97331-3601
Phone: 541-737-2942
Website: http://agsci.oregonstate.edu/appliedecon (http://agsci.oregonstate.edu/appliedecon/)

Applied Economics Graduate Program

John Antle, Director
213 Ballard Extension Hall
Oregon State University
Corvallis, OR 97331-3601
Phone: 541-737-1425
Website: http://agsci.oregonstate.edu/applied-economics-graduate-program (http://agsci.oregonstate.edu/applied-economics/aecgradprogram/)
Email: applied.economics@oregonstate.edu

Faculty

Professors Alix-Garcia, Antle, Boggess, Capalbo, Diebel, Jaeger, Lewis, Reimer, Seavert, Sylvia, Wu
Associate Professors Chen, Durham, Langpap, Rigs, Sterns
Assistant Professors Dundas, Kling, Melesse, Streletskaya
Assistant Professors (Sr. Researchers) Bell, Cross, Valdivia
Instructors Brekken, Olen, Rahe
Senior Research Assistant Houston
Faculty Research Assistant Olen
Research Associate Brekken
Professional Faculty Radke, Richardson, Sandler
Adjunct Faculty D. Adams, Berrnell, Elston, Landkamer, Rosenberger, Talbott
Courtesy Faculty Albers, Barnhart, Doring, McCoy, McGovern, Papenfus, Plantinga, Whittaker

Affiliate Faculty Gwin
Emeritus Faculty R. Adams, Buccola, Burt, Eleveld, Färe, Hanna, Johnston, Lev, Mc Mullen, Rettig, Sorte, Weber

AEC Graduate Faculty

The Applied Economics Graduate Program currently has 27 faculty members, drawn from three departments and two schools in five colleges.


Applied Economics

AEC 121. DISCOVERING AGRICULTURAL AND RESOURCE ECONOMICS. (1 Credit)
Explore issues, opportunities, and challenges in the dynamic and diverse employment field of agricultural and resource economics.
Equivalent to: AREC 121

AEC 199. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Equivalent to: AREC 199
This course is repeatable for 8 credits.

AEC 211. AGRICULTURAL AND FOOD MANAGEMENT. (4 Credits)
Economic and business principles applied to the management of firms in agricultural and food industries, including farms, ranches and nurseries, agricultural input suppliers, packers, shippers, processors and food manufacturers and distributors; firm-level goal setting, information management and financial analysis.
Prerequisites: AEC 250 with C- or better or AEC 251 with C- or better or AREC 250 with C- or better or ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: AREC 211

AEC 221. AGRICULTURAL AND FOOD MARKETING. (3 Credits)
Organization and functions of agricultural and food markets both domestic and international; market channels and supply chains for various agricultural commodities and food products; role of agribusiness, cooperatives, and government in marketing decisions.
Prerequisites: AEC 250 with D- or better or AEC 251 with D- or better or AREC 250 with C- or better or ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AREC 221

AEC 240. RURAL ECONOMICS OF PLACE AND PEOPLE. (3 Credits)
Provides perspective on issues influencing rural communities and economic development in rural America. People, places and natural resources of rural communities play a vital role in economic vitality of the West, yet rural landscapes are changing faster than many urban counterparts. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: AREC 240
AEC 243. *GLOBAL POVERTY AND SUSTAINABLE DEVELOPMENT. (3 Credits)
Students are introduced to the challenges of eradicating extreme poverty and achieving sustainable economic development in the world. Topics include: the measurement of poverty and inequality; analysis of food security and agricultural development; the role of health and education in economic development; credit markets; risk and insurance; climate change and biodiversity; gender equality; rural-urban and international migration; population growth and development; institutions and economic performance; the political economy of development. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

AEC 250. *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: AEC 250H, AREC 250, AREC 250
Recommended: MTH 111

AEC 250H. *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: AEC 250
Recommended: MTH 111

AEC 251. *INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS. (3 Credits)
An introductory applied microeconomics course focused on the unique challenges of agricultural and food systems. Topics include rational choice theory, models of supply and demand, and price formation, with particular attention on markets for agricultural and food products. Additional topics include market interdependencies, government policy, the behavior of firms, and market structure within agricultural and food systems. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Recommended: MTH 111

AEC 253. *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS. (4 Credits)
A general introduction to federal environmental law and policy in the U.S. Familiarizes students with basic legal institutions and concepts of the American legal system, outlines the transition of environmental policy from its common law roots to its modern administrative law form, and gives an overview of the major federal environmental statutes. Relationships among legal theory and process and economic principles are emphasized. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: AREC 253

AEC 299. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Equivalent to: AREC 299
This course is repeatable for 8 credits.

AEC 310. EXPLORING EXPERIENTIAL LEARNING OPPORTUNITIES. (2 Credits)
Provides background and preparation for students’ experiential learning (EL) activities. Students will be shown examples of appropriate EL, how to find and compete for opportunities, and how to establish and define their learning objectives for EL. Resume writing, appropriate conduct in the workplace, as well as writing and oral presentation skills will be covered. A proposal for an EL activity will be prepared and presented to classmates. Graded P/N.
Recommended: WR 121

AEC 311. INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS. (4 Credits)
An examination of the theories of consumer behavior and demand, production cost, the firm, supply, and competitive and monopoly market structures.
Prerequisites: ((AEC 250 with C- or better or AREC 250 with C- or better) or AEC 251 with C- or better or (ECON 201 with C- or better or ECON 201H with C- or better)) and (MTH 241 [C-] or (MTH 251 [C-] or MTH 251H [C-]))
Equivalent to: AREC 311

AEC 313. INTERMEDIATE APPLIED ECONOMICS II: MARKETS, WELFARE & POLICY. (4 Credits)
Complementing the private-decision focus in AEC 311, the present course focuses on the intermediate microeconomic theory of social welfare and public decision-making. Topics include exchange, monopoly, game theory, social welfare, externalities, public goods and choice, asymmetric information, uncertainty, and cost-benefit analysis. Substantial attention will be given to the implications of these theories for real-world problems, especially regarding resource and environmental issues.
Prerequisites: MTH 241 with C- or better or (AEC 311 with C- or better or AREC 311 with D- or better or ECON 311 with C- or better)
Equivalent to: AREC 313

AEC 351. *NATURAL RESOURCE ECONOMICS AND POLICY. (3 Credits)
Application of principles of economics to identify the causes, consequences, and ways of dealing with natural resource problems, including problems associated with fisheries, forests, water resources, and land. Conceptual topics and policy applications. Emphasis is on developing students’ skill in applying an economic way of thinking about natural resource management. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: (AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better)
Equivalent to: AREC 351

AEC 352. *ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Provides an overview of the interrelationships between economic activity, the environment, and public policy. Through case studies, discussion groups, readings, and group activities, students learn how economists define and analyze environmental problems and the types of policies they advocate for managing environmental quality. CROSSLISTED as AEC 352/ ECON 352. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AREC 352
AEC 353. *INTRODUCTION TO COASTAL AND MARINE RESOURCE ECONOMICS. (3 Credits)
Introduces tools of economic analysis for understanding coastal and marine resource management. Surveys a selection of current topics in the field, emphasizing innovation in production and stewardship, institutions, and sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: MTH 111 with C- or better and (AEC 250 [C-] or AREC 250 [C-] or ECON 201 [C-] or ECON 201H [C-])
AEC 372. AGRICULTURAL COOPERATIVES. (3 Credits)
An introduction to and in-depth examination of the agricultural cooperative. Students will gain a working knowledge of the concepts, principles, and terminology of agricultural cooperatives through reference materials, lectures, presentations by guest speakers and a cooperatives tour. Students will consider the strengths and weaknesses of the agricultural cooperative as well as the unique management and operational challenges inherent to this form of business operation.
Prerequisites: AEC 211 with D- or better or AREC 211 with D- or better
Equivalent to: AREC 372
AEC 388. AGRICULTURAL LAW. (4 Credits)
Application of legal principles to business decision making in farming, ranching, and the agricultural support industry. Consideration of the obligations arising out of contract, tort, property, water, public land, and natural resource law.
Equivalent to: AREC 388
AEC 399. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Equivalent to: AEC 399H, AREC 399H
This course is repeatable for 8 credits.
AEC 399H. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Attributes: HNRS – Honors Course Designator
Equivalent to: AEC 399, AREC 399
This course is repeatable for 8 credits.
AEC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AREC 401
This course is repeatable for 16 credits.
AEC 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AREC 402
This course is repeatable for 16 credits.
AEC 403. THESIS. (1-16 Credits)
Equivalent to: AREC 403
This course is repeatable for 16 credits.
AEC 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AREC 405
This course is repeatable for 16 credits.
AEC 406. PROJECTS. (1-16 Credits)
Equivalent to: AREC 406
This course is repeatable for 16 credits.
AEC 407. SEMINAR. (1-16 Credits)
Equivalent to: AEC 407H, AREC 407, AREC 407H
This course is repeatable for 16 credits.
AEC 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: AEC 407, AREC 407, AREC 407H
This course is repeatable for 16 credits.
AEC 408. WORKSHOP. (1-16 Credits)
Equivalent to: AREC 408
This course is repeatable for 16 credits.
AEC 410. INTERNSHIP. (1-6 Credits)
Practical on-the-job training in agricultural business, marketing, commercial agricultural production, or related private or public organizations. Graded P/N.
Equivalent to: AREC 410
This course is repeatable for 6 credits.
AEC 421. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the ‘social safety net’ that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSTLISTED as RS 421.
Equivalent to: AREC 421, RS 421
AEC 432. ENVIRONMENTAL LAW. (4 Credits)
Legal relationships arising out of rights to air, water, and land. The impact of federal and state regulation on pollution control and on the production, use, and disposal of hazardous materials.
Equivalent to: AREC 432
AEC 434. *MEASURING RESOURCE AND ENVIRONMENTAL IMPACTS. (4 Credits)
Examines economic perspectives on the allocation of natural resources and the management of environmental quality, emphasis on the use of economic concepts in the design and evaluation of public policies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: AEC 313 with D- or better or AREC 313 with D- or better
Equivalent to: AREC 434
AEC 440. THE ECONOMICS OF BUSINESS ORGANIZATION IN THE FOOD SYSTEM. (4 Credits)
Application of economic analysis to questions related to the choice of an appropriate form of business organization for a wide variety of food system enterprises. Topics include costs of contracting, costs of ownership, enterprise scope and scale, and the dynamics of business ownership and structure. Particular emphasis is given to entrepreneurial enterprises and cooperative businesses in the food system.
Prerequisites: AEC 311 with D- or better or ECON 311 with D- or better
Equivalent to: AREC 442
AEC 442. AGRICULTURAL BUSINESS MANAGEMENT. (4 Credits)
Application of economic, financial, and strategic management principles to agricultural business with a focus on a case-study framework for analysis and business decision making for alternative business management strategies.
Equivalent to: AREC 442
AEC 444. COMMODITY FUTURES AND OPTIONS MARKETS. (4 Credits)
Provides an overview of the basic concepts needed to use commodity futures and options markets to successfully manage price risk.
To address the increasingly global economy in which commodity transactions occur, the course also includes financial futures such as interest rates and currencies. Specific topics covered include contract standardization, speculation and hedging, opening and closing of positions, and basis, i.e. the relationship between cash and futures markets, input-output hedges, and spreads. Students also gain hands-on experience through a trading simulation.
Equivalent to: AREC 444

AEC 446. INTRODUCTION TO APPLIED ECONOMETRICS. (4 Credits)
Introduces students to applied econometrics: the use of statistical techniques to estimate and test economic relationships. Topics include multiple regression models, multicollinearity, and simultaneous equations. The applications and labs will focus on econometric analysis of real world problems pertaining to issues in environmental, food, and resource economics and policy. Lec/lab.
Prerequisites: AEC 311 with D- or better and ST 351 [D-]

AEC 447. AGRICULTURAL PRICE AND MARKET ANALYSIS. (4 Credits)
Price determination for food and agricultural commodities; development of quantitative economic models that explain and predict prices and other market outcomes. Lec/lab.
Equivalent to: AREC 447
Recommended: AEC 311 and ST 351

AEC 448. ADVANCED TOPICS IN ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Explores advanced applications of environmental and resource economics to selected policy and management concerns in the PNW and globally. Attention will be directed to the methodological underpinnings of environmental and resource policies and instruments using case studies on real world management issues.
Prerequisites: AEC 311 with D- or better and AEC 351 [D-] and AEC 352 [D-]
Equivalent to: AEC 448

AEC 452. MARINE ECONOMICS. (3 Credits)
Economic aspects of marine resource utilization and management will be analyzed. Topics include open access aspect of marine resources; conflict and allocation of marine resources, marine resource markets, marine recreation, pollution, and aquaculture, with special emphasis on commercial fisheries.
Prerequisites: AEC 351 with D- or better or AEC 352 with D- or better or AREC 351 with D- or better or AEC 352 with D- or better
Equivalent to: AEC 452

AEC 453. CONSERVATION ON PRIVATE LAND. (3 Credits)
Explore and experience the increasingly popular phenomenon of conservation on private land. This exploration includes the explosive growth of land trusts and the use of conservation easements to restrict the use of private land and often promote ecological goals.
Prerequisites: AEC 221 with D- or better and (AEC 250 [D-] or AEC 251 [D-] or AREC 211 [D-] or AREC 211 [D-] or ECON 201 [D-] and (AEC 201 [D-] or AREC 201 [D-] or AREC 201 [D-] or AREC 201 [D-] or ECON 201 [D-])
Equivalent to: AEC 465

AEC 455. PROGRAM EVALUATION. (3 Credits)
Explores the leading methods for evaluating the effectiveness of public programs and policies, specifically focusing on causal inference and empirical applications.
Prerequisites: (AEC 311 with C- or better or ST 351 with C- or better) and AEC 313 [C-]

AEC 460. CAPITAL INVESTMENT ANALYSIS USING AGBiz LOGIC. (3 Credits)
Learn and understand the important factors in measuring the impacts of implementing technologies and/or conservation practices, adding value to products, or changing cropping systems or livestock enterprises. The AgBiz LogicTM software programs will be used to apply financial and economic principles to better understand and reduce the financial, production, marketing, and human resource risks facing agribusinesses.
Equivalent to: AREC 460

AEC 461. *AGRICULTURAL AND FOOD POLICY ISSUES. (4 Credits)
Principles of agricultural and food policy formulation; agricultural adjustment processes; agricultural price and income policies in relation to land use, water, and rural development policies; interrelationships among U.S. and foreign agriculture and trade policies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better) and (AEC 300 [D-] or AREC 300 [D-] or AEC 311 [D-] or AREC 311 [D-] or ECON 311 [D-])
Equivalent to: AREC 461

AEC 465. AGRICULTURAL AND FOOD FINANCIAL MANAGEMENT. (4 Credits)
Students will develop risk management strategies utilizing the AgBiz Logic program to reduce the financial, production, marketing, and human resource risks facing agribusinesses. This course is designed to help students apply financial and economic principles to business decisions under diverse and changing circumstances. The course reviews basic financial reporting statements, details accounting and financing practices specific to agricultural and food enterprises.
Prerequisites: (AEC 211 with D- or better or AREC 211 with D- or better) and AEC 311 [D-]
Equivalent to: AEC 465

AEC 466. AGRICULTURAL AND FOOD MARKETING MANAGEMENT. (4 Credits)
Principles, trends, issues, barriers, policies, strategies and decisions involved in domestic and international marketing of perishable and storable agricultural commodities and food products from the point of production to the point of consumption. Topics include firm-level marketing concepts, the integration of marketing with firms’ overall strategic management goals, as well as comparative studies across multiple outlets for agricultural and food products, to include local, regional, and global markets.
Prerequisites: (AEC 221 with D- or better and (AEC 250 [D-] or AEC 251 [D-] or ECON 201 [D-])

AEC 475. WRITING BUSINESS PLANS: AGRICULTURE/FOOD-RELATED ENTERPRISES. (2 Credits)
Students choose an enterprise and write a comprehensive business plan that describes the business vision, marketing plan, financial projections, risk management, and implementation strategy. At the end of term selected students present their plan to a commercial lender.
Equivalent to: AREC 475
Recommended: AEC 211 and AEC 221
AEC 499. SPECIAL TOPICS. (1-16 Credits)
Various topics in agricultural and resource economics of special and current interest not covered in other courses.
Equivalent to: AREC 499
This course is repeatable for 16 credits.

AEC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AREC 501
This course is repeatable for 16 credits.

AEC 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

AEC 503. THESIS. (1-16 Credits)
Equivalent to: AREC 503
This course is repeatable for 999 credits.

AEC 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AREC 505
This course is repeatable for 16 credits.

AEC 506. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

AEC 507. SEMINAR. (1-16 Credits)
Equivalent to: AREC 507
This course is repeatable for 16 credits.

AEC 508. WORKSHOP. (1-16 Credits)
Equivalent to: AREC 508
This course is repeatable for 16 credits.

AEC 512. MICROECONOMIC THEORY I. (4 Credits)
Fundamental topics in microeconomic theory. Topics include utility maximization and consumer demand, profit maximization and the theory of the firm, and labor and capital markets.
Recommended: AEC 312 and MTH 252

AEC 513. MICROECONOMIC THEORY II. (4 Credits)
Emphasizes principles for microeconomic theory at the master's level. Builds upon the foundations covered in AEC 512, and extends the theory and principles to cover uncertainty, game theory, competitive market equilibrium and welfare analysis, imperfect competition, and market failures. Primary emphasis is on understanding microeconomic theory and the underlying assumptions, and how it is applied to real world settings.
Prerequisites: AEC 512 with C or better

AEC 521. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the 'social safety net' that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSLISTED as RS 521.
Equivalent to: AREC 521, RS 521

AEC 525. APPLIED ECONOMETRICS. (4 Credits)
General principles of applied econometric research are emphasized, including model building, data analysis, hypothesis testing, and evaluation and interpretation of results. A variety of estimators are applied to real data, including least squares, panel data, simultaneous equations, discrete choice, and limited dependent variable models.

AEC 532. ENVIRONMENTAL LAW. (4 Credits)
Legal relationships arising out of rights to air, water, and land. The impact of federal and state regulation on pollution control and on the production, use, and disposal of hazardous materials.
Equivalent to: AREC 532

AEC 534. ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Examines environmental and natural resource issues emphasizing the role of economics in understanding their causes, consequences, and potential solutions (e.g., air, water, fish, forests, climate change, biodiversity). Reviews welfare economics, market failures, externalities, property rights. Covers non-market valuation, innovative market and regulatory policies.
Equivalent to: AREC 534
Recommended: AEC 311 or AREC 311

AEC 540. THE ECONOMICS OF BUSINESS ORGANIZATION IN THE FOOD SYSTEM. (4 Credits)
Application of economic analysis to questions related to the choice of an appropriate form of business organization for a wide variety of food system enterprises. Topics include costs of contracting, costs of ownership, enterprise scope and scale, and the dynamics of business ownership and structure. Particular emphasis is given to entrepreneurial enterprises and cooperative businesses in the food system.
Recommended: AEC 311 or ECON 311

AEC 543. INTERNATIONAL TRADE. (4 Credits)
Introduction to the major theories of international trade and to models that are useful for applied policy and regional analysis. Effects of trade and trade policy on consumers, workers, and firms are emphasized.
Prerequisites: AEC 513 with C or better
Equivalent to: AREC 543

AEC 544. COMMODITY FUTURES AND OPTIONS MARKETS. (4 Credits)
Provides an overview of the basic concepts needed to use commodity futures and options markets to successfully manage price risk.
To address the increasingly global economy in which commodity transactions occur, the course also includes financial futures such as interest rates and currencies. Specific topics covered include contract standardization, speculation and hedging, opening and closing of positions, and basis, i.e. the relationship between cash and futures markets, input-output hedges, and spreads. Students also gain hands-on experience through a trading simulation.
Equivalent to: AREC 544

AEC 546. INTRODUCTION TO APPLIED ECONOMETRICS. (4 Credits)
Introduces students to applied econometrics: the use of statistical techniques to estimate and test economic relationships. Topics include multiple regression models, multicollinearity, and simultaneous equations. The applications and labs will focus on econometric analysis of real world problems pertaining to issues in environmental, food, and resource economics and policy. Lec/lab.
Recommended: AEC 311 and ST 351

AEC 548. ADVANCED TOPICS IN ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Explores advanced applications of environmental and resource economics to selected policy and management concerns in the PNW and globally. Attention will be directed to the methodological underpinnings of environmental and resource policies and instruments using case studies on real world management issues.
Recommended: AEC 311 and AEC 351 and AEC 352

AEC 550. ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS. (4 Credits)
Presents concepts, theories, and methods used in the economic analysis of environmental and natural resource issues. The emphasis is on the economics of environmental policies and the development of decision rules regarding the efficient use of natural resources.
Prerequisites: AEC 512 with C or better
Equivalent to: AREC 550
AEC 551. APPLICATIONS OF ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS. (4 Credits)
Applies and expands upon concepts, theories, and methods in environmental and natural resource economics introduced in AEC 550. Topics include non-market valuation, discounting, and benefit-cost analysis, as well as the role and importance of institutions, appropriate research methods, and the philosophical basis for normative judgments in economics.
Prerequisites: AEC 550 with C or better or AREC 550 with C or better
Equivalent to: AREC 551

AEC 552. MARINE ECONOMICS. (3 Credits)
Economic aspects of marine resource utilization and management will be analyzed. Topics include open access aspect of marine resources; conflict and allocation of marine resources, marine resource markets, marine recreation, pollution, and aquaculture, with special emphasis on commercial fisheries. CROSSLISTED as AEC 552/MRM 552.
Equivalent to: AEC 552, MRM 552
Recommended: (AEC 351 or AEC 352 or AREC 351 or AREC 352)

AEC 553. CONSERVATION ON PRIVATE LAND. (3 Credits)
Explore and experience the increasingly popular phenomenon of conservation on private land. This exploration includes the explosive growth of land trusts and the use of conservation easements to restrict the use of private land and often promote ecological goals.

AEC 554. RURAL DEVELOPMENT ECONOMICS AND POLICY. (3 Credits)
Learn economic and regional development conceptual frameworks. Explore U.S. rural development and government interventions. Discuss differing popular local strategies for development that emphasize building current assets like local entrepreneurship to attracting resources and incomes from outside the region like amenity migration and tourism.
Equivalent to: AREC 554

AEC 555. PROGRAM EVALUATION. (3 Credits)
Explores the leading methods for evaluating the effectiveness of public programs and policies, specifically focusing on causal inference and empirical applications.

AEC 560. CAPITAL INVESTMENT ANALYSIS USING AGBIZ LOGIC. (3 Credits)
Learn and understand the important factors in measuring the impacts of implementing technologies and/or conservation practices, adding value to products, or changing cropping systems or livestock enterprises. The AgBiz LogicTM software programs will be used to apply financial and economic principles to better understand and reduce the financial, production, marketing, and human resource risks facing agribusinesses.
Equivalent to: AREC 560

AEC 565. AGRICULTURAL AND FOOD FINANCIAL MANAGEMENT. (4 Credits)
Students will develop risk management strategies utilizing the AgBiz Logic program to reduce the financial, production, marketing, and human resource risks facing agribusinesses. This course is designed to help students apply financial and economic principles to business decisions under diverse and changing circumstances. The course reviews basic financial reporting statements, details accounting and financing practices specific to agricultural and food enterprises.
Equivalent to: AREC 565
Recommended: (AEC 211 or AREC 211) and AEC 311

AEC 566. AGRICULTURAL AND FOOD MARKETING MANAGEMENT. (4 Credits)
Principles, trends, issues, barriers, policies, strategies and decisions involved in domestic and international marketing of perishable and storable agricultural commodities and food products from the point of production to the point of consumption. Topics include firm-level marketing concepts, the integration of marketing with firms' overall strategic management goals, as well as comparative studies across multiple outlets for agricultural and food products, to include local, regional, and global markets.
Recommended: AEC 221 and (AEC 250 or AEC 251 or ECON 201)

AEC 599. SPECIAL TOPICS. (0-16 Credits)
Various topics in applied economics of special and current not covered in other courses. May be repeated for credit when topics differ.
Equivalent to: AREC 599
This course is repeatable for 16 credits.

AEC 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AREC 601
This course is repeatable for 16 credits.

AEC 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AREC 605
This course is repeatable for 16 credits.

AEC 603. THESIS. (1-16 Credits)
Equivalent to: AREC 603
This course is repeatable for 999 credits.

AEC 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AREC 605
This course is repeatable for 16 credits.

AEC 606. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

AEC 607. SEMINAR. (1-16 Credits)
Equivalent to: AREC 607
This course is repeatable for 16 credits.

AEC 608. WORKSHOP. (1-16 Credits)
Equivalent to: AREC 608
This course is repeatable for 16 credits.

AEC 611. ADVANCED MICROECONOMIC THEORY I. (4 Credits)
A rigorous development of the theory of consumption and production, with emphasis on duality.
Prerequisites: (AEC 512 with C or better and AEC 513 [C])
Recommended: MTH 254

AEC 612. ADVANCED MICROECONOMIC THEORY II. (4 Credits)
A rigorous extension of the theory of the consumer and firm to aggregate and heterogeneous populations, decision making under uncertainty, and related game theory concepts.
Prerequisites: AEC 611 with C or better

AEC 613. ADVANCED MICROECONOMIC THEORY III. (4 Credits)
A rigorous development of the theory of competitive equilibrium, market power, public goods, and information.
Prerequisites: AEC 612 with C or better
AEC 625. ADVANCED ECONOMETRICS I. (4 Credits)
Emphasizes the basic theory underlying the main types of estimators used in econometrics, as well as their application in empirical research. Includes derivation, properties, and application of method of moments, maximum likelihood, ordinary and generalized least squares, and instrumental variables estimators, statistical inference and hypothesis testing, and model building and specification analysis. Provides the necessary foundation for estimation techniques covered in AEC 626. Lec/lab.
Prerequisites: AEC 525 with C or better

AEC 626. ADVANCED ECONOMETRICS II. (4 Credits)
Extensions to the generalized linear regression model are considered: discrete choice, limited dependent variable, panel data, and simultaneous equations models, and new solutions to identification problems. Strong applied orientation, emphasizing problems of data measurement, model selection and specification.
Prerequisites: AEC 625 with C or better

AEC 627. COMPUTATIONAL ECONOMICS. (4 Credits)
Covers the numerical analysis of static optimization models and stochastic dynamic models in resource and development economics, emphasizing formulation, solution, and simulation of dynamic optimization, rational expectations, and arbitrage pricing models. Lec/lab.

AEC 640. SUSTAINABLE DEVELOPMENT. (3 Credits)
Surveys research on the quantitative economic analysis of sustainable development, with an emphasis on integrated assessment methods and models and their application to agriculture and rural development policy, agricultural technology impact assessment, and climate change impact assessment.
Prerequisites: AEC 611 with D- or better and AEC 612 [D-] and AEC 625 [D-]
Equivalent to: AREC 640

AEC 643. ADVANCED TOPICS IN DEVELOPMENT ECONOMICS. (3 Credits)
Introduces students to key issues in the economics of development and equips them with the theoretical and empirical tools required to conduct advanced research in these topics.
Prerequisites: AEC 613 with C or better and AEC 626 [C]
Equivalent to: AREC 643

AEC 651. ADVANCED NATURAL RESOURCE ECONOMICS. (3 Credits)
Contemporary economic theory of dynamic natural resource allocation is introduced. Assignments focus on analytical and numerical methods for solving dynamic optimization problems in resource and environmental management. Lecture and readings emphasize current research trends in the field and relevant advances in quantitative methodology.
Prerequisites: AEC 611 with C or better
Equivalent to: AREC 651

AEC 652. ADVANCED ENVIRONMENTAL ECONOMICS. (3 Credits)
Interrelationships of natural resource use and the environment; applied welfare and benefit-cost analysis; externalities and pollution abatement; non-market valuation of resources; property rights; legal and social constraints; policy approaches.
Prerequisites: (AEC 513 with C or better or AREC 513 with C or better) and (AEC 525 [C] or AREC 525 [C])
Equivalent to: AREC 652

AEC 653. EMPIRICAL ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Introduces empirical methods at the current frontiers of research in environmental and resource economics. General topics may include the identification of non-market values, revealed and stated preference methods, environmental policy evaluation, equilibrium sorting models, and climate econometrics.
Prerequisites: AEC 513 with C or better and AEC 525 [C]
Equivalent to: AREC 653

AEC 699. SPECIAL TOPICS. (1-16 Credits)
Various topics in applied economics of special and current interest not covered in other courses.
Equivalent to: AREC 699
This course is repeatable for 16 credits.

Rural Studies
RS 421. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the 'social safety net' that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSLISTED as AEC 421.
Equivalent to: AEC 421, AREC 421

RS 499. SPECIAL TOPICS. (1-5 Credits)
This course is repeatable for 9 credits.

RS 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 9 credits.

RS 512. INTRODUCTION TO RURAL STUDIES. (2 Credits)
Introduces students to the emerging theoretical perspectives, methodologies, and critical themes that define rural studies in the U.S. and elsewhere. It draws primarily from the disciplines of sociology, economics, anthropology, human development and geography, examining how each discipline understands and analyzes rural households and communities.

RS 513. CONTEMPORARY RURAL ISSUES. (2 Credits)
The focus will be on issues confronting rural Oregon. The class will also explore broader U.S. and international rural issues and examine commonalities and differences across cultures and development contexts. Weekly lecturers are drawn from the OSU community and beyond, including public policy makers, rural stakeholders, and nonprofit organizations.

RS 521. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the 'social safety net' that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSLISTED as AEC 521.
Equivalent to: AEC 521, AREC 521

RS 599. SPECIAL TOPICS. (1-5 Credits)
This course is repeatable for 9 credits.
Agricultural and Food Business Management Undergraduate Major (BS, HBS)

This degree blends coursework in agricultural economics, business, agricultural sciences, computer science, arts, and humanities so that graduates can respond to the unique challenges and opportunities in agribusiness vocations.

Major Code: 897

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<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<td>*INTRODUCTION TO MICROECONOMICS</td>
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<td>ECON 202</td>
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<td>AEC 311</td>
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<td>AEC 442</td>
<td>AGRICULTURAL BUSINESS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>AEC 461</td>
<td>*AGRICULTURAL AND FOOD POLICY ISSUES</td>
<td>4</td>
</tr>
<tr>
<td>AEC 465</td>
<td>AGRICULTURAL AND FOOD FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>AEC 466</td>
<td>AGRICULTURAL AND FOOD MARKETING MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>AEC 446</td>
<td>INTRODUCTION TO APPLIED ECONOMETRICS</td>
<td></td>
</tr>
<tr>
<td>AEC 447</td>
<td>AGRICULTURAL PRICE AND MARKET ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>ECON 424</td>
<td>INTRODUCTION TO ECONOMETRICS</td>
<td></td>
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<tr>
<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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</tbody>
</table>

Experiential Learning

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>AEC 406</td>
<td>PROJECTS</td>
<td>6</td>
</tr>
<tr>
<td>or AEC 410</td>
<td>INTERNSHIP</td>
<td></td>
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</table>

Four courses from AEC or additional upper division courses 1

Business Administration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 330</td>
<td>LEGAL ENVIRONMENT OF BUSINESS</td>
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</table>

Upper Division Business Courses

Select two courses from the following: 8

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BA 302</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td></td>
</tr>
<tr>
<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
<td></td>
</tr>
<tr>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td></td>
</tr>
<tr>
<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 390</td>
<td>MARKETING</td>
<td></td>
</tr>
<tr>
<td>BA 463</td>
<td>FAMILY ENTERPRISE GOVERNANCE</td>
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<tr>
<td>FIN 441</td>
<td>FINANCIAL INSTITUTIONS</td>
<td></td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
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</tr>
<tr>
<td>MRKT 493</td>
<td>INTEGRATED MARKETING COMMUNICATIONS</td>
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<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
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<tr>
<td>MRKT 497</td>
<td>GLOBAL MARKETING</td>
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Computers and Technology

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<th>Hours</th>
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<tbody>
<tr>
<td>AG 111</td>
<td>INFORMATION TECHNOLOGY IN AGRICULTURE</td>
<td>3-4</td>
</tr>
<tr>
<td>or CS 101</td>
<td>COMPUTERS: APPLICATIONS AND IMPLICATIONS</td>
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</table>

Mathematics 2

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<tr>
<th>Code</th>
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<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
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<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
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Statistics 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
</tbody>
</table>

Quantitative Courses

Select two courses from the following: 8

Agricultural Business Management Minor

Also available via Ecampus.

The Agricultural Business Management minor offers students an opportunity to expand their skill sets and business acumen as they prepare for careers in production agricultural and related industries. This minor emphasizes the development of general skills in business administration and economic analysis relevant to the operations of farms, ranches, nurseries and the businesses that provide inputs, services and market outlets for them.

The Agricultural Business Management minor is available to students who are not pursuing the ABM major. Business Administration majors planning to minor in Agricultural Business Management must see both a College of Business advisor and a Department of Applied Economics advisor to discuss certain course restrictions in the minor. Business majors must choose alternate courses to replace the credits that are also in the Business Administration major.
Minor Code: 104

Each minor in the Applied Economics Department is created to provide students within and outside the discipline the opportunity to study a secondary area. Each minor requires 27 credits of course work in addition to the student's major. At least 12 of the 27 credits must be upper division. No credits counted toward the minor can be courses also counted toward the student's major.

- Agricultural Business Management (ABM) majors may not elect to complete an Agricultural Business Management.
- Environmental Economics and Policy (EEP) majors may not elect to complete a Resource Economics or Natural Resource and Environmental Law and Policy minor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC 211</td>
<td>AGRICULTURAL AND FOOD MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>AEC 221</td>
<td>AGRICULTURAL AND FOOD MARKETING</td>
<td>3</td>
</tr>
<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td>3-4</td>
</tr>
<tr>
<td>AEC 251</td>
<td>*INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td></td>
</tr>
<tr>
<td>AEC 311</td>
<td>INTERMEDIATE APPLIED ECONOMICS: PRODUCERS AND CONSUMERS</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 311</td>
<td>INTERMEDIATE MICROECONOMIC THEORY</td>
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<tr>
<td>Additional credits 1</td>
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Total Hours: 27-28

- Baccalaureate Core Course (BCC)

1 Students will work with the academic advisor in the Department of Applied Economics to select additional courses for a total of 27 credits

Minor Code: 104

Applied Economics Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Resource and environmental economics, trade and development, public health economics, and transportation economics (MA, MS only)

The Applied Economics Graduate Program provides students with a strong foundation in economic theory, and quantitative methods while preserving sufficient flexibility to specialize in their areas of interest. The core curriculum includes courses in microeconomic and macroeconomic theory, in quantitative methods, and includes a set of qualifying examinations. Additional course work is required in the areas of concentration, which include: research and environmental economics, trade and development, public health economics, transportation economics, and an open area of concentration. The open area can accommodate students’ interests in applied economic policy, sustainable development, food and climate policy, and marine issues. The hallmark of the Applied Economics Graduate Program is the training of students to understand and utilize economic theories, principles, and methods to examine real-world problems with significant attention to data, institutions, and context.

Since faculty from across campus are members of the graduate faculty in Applied Economics and are potential research advisors, the Applied Economics Graduate Program allows students to work with faculty who most closely match their interests.

These faculty reside in many academic departments at Oregon State University, including the Department of Applied Economics, the School of Public Policy, the Department of Forest Ecosystems and Society, the Department of Forest Resources, Engineering and Management, and the College of Public Health and Human Sciences. Many students are supported by graduate teaching or graduate research assistantships. The Graduate School website also provides information related to financing your graduate education.

For detailed information on the Applied Economics Graduate Program, please review the webpage (https://appliedecon.oregonstate.edu/appliedecon/applied-economics-graduate-program/) or contact Dr. John Antle, Director of Admissions, Applied Economics Graduate Program, 213 Ballard Extension Hall, OSU, Corvallis, OR 97331 or phone: 541-737-1425, or email applied.economics@oregonstate.edu

Major Code: 1290

Applied Economics Graduate Minor

For detailed information on the Applied Economics Graduate Program, please review the webpage (http://appliedecon.oregonstate.edu/applied-economics/aecgradprogram/) or contact:

Dr. John Antle, Director of Admissions
Applied Economics Graduate Program
213 Ballard Extension Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-1425
Email: applied.economics@oregonstate.edu

Minor Code: 1290

Minor Code: 1290

Environmental Economics and Policy Undergraduate Major (BS, HBS)

Also available via Ecampus.

The BS degree in Environmental Economics and Policy focuses on the development of strong economic and statistical skills and their use in the analysis while providing flexibility to incorporate interests in the biological, physical or social sciences. They also will focus on course work in environmental sciences, political sciences, and related subject areas with a greater focus on the socioeconomic dimensions of environmental sciences.

Major Code: 237

Grade Requirements

All EEP majors must complete the core list of courses with a grade of C– or higher.
Food Economics and Policy Minor

The Food Economics and Policy minor offers students an opportunity to expand their understanding of the economic and political foundations of contemporary agricultural and food systems. This minor emphasizes the complexity and inter-connectedness of consumer demand and the food system's ability to supply agricultural and food products that meet this demand.

The Food Economics and Policy minor is available to all OSU students except for those who are pursuing the Agricultural Business Management (ABM) major.

International Agricultural Development Graduate Minor

The graduate minor in International Agricultural Development is not available to students who took the undergraduate minor in Comparative International Agriculture at Oregon State University.

Natural Resource and Environmental Law and Policy Minor

Also available via Ecampus.

The Natural Resource and Environmental Law and Policy minor is available to students who are not pursuing the EEP major.
upper division. No credits counted toward the minor can be courses also counted toward the student’s major.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC 253</td>
<td>*ENVIRONMENTAL LAW, POLICY, AND ECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>AEC 388</td>
<td>AGRICULTURAL LAW</td>
<td>4</td>
</tr>
<tr>
<td>AEC 432</td>
<td>ENVIRONMENTAL LAW</td>
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<td>Select 15 additional credits</td>
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<td><strong>Total Hours</strong></td>
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<td><strong>27</strong></td>
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</table>

* Baccalaureate Core Course (BCC)

Students will work with the academic advisor in the Department of Applied Economics to select additional courses for a total of 27 credits

Minor Code: 670

**Resource Economics Minor**

Also available via Ecampus.

The Resource Economics minor is available to students who are not pursuing the EEP major.

Minor Code: 103

Each minor in the Applied Economics Department is created to provide students within and outside the discipline the opportunity to study a secondary area. Each minor requires 27 credits of course work in addition to the student’s major. At least 12 of the 27 credits must be upper division. No credits counted toward the minor can be courses also counted toward the student’s major.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
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<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td>3-4</td>
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<tr>
<td>or ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td></td>
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<tr>
<td>AEC 311</td>
<td>INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 311</td>
<td>INTERMEDIATE MICROECONOMIC THEORY</td>
<td></td>
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<tr>
<td>AEC 351</td>
<td>*NATURAL RESOURCE ECONOMICS AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>AEC 352</td>
<td>*ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
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<tr>
<td>Additional credits</td>
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<td><strong>Total Hours</strong></td>
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<td><strong>27-28</strong></td>
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</table>

* Baccalaureate Core Course (BCC)

Students will work with the academic advisor in the Department of Applied Economics to select additional courses for a total of 27 credits

Minor Code: 103

**Rural Studies Graduate Minor**

Rural communities—both in the U.S. and globally—face an extraordinarily complex set of challenges due to sparse settlements and geographic isolation, exacerbated by globalization and technological change in an interdependent urban-rural system. Addressing these challenges requires both the theoretical insights of multiple disciplines and the practical wisdom that derives from engagement in solving actual problems in rural places. Emerging approaches to the study of rural people and places offer opportunities to examine rural issues from the perspective of multiple disciplines and diverse research methods that can capture the complexities at the intersections of place and space. Yet graduate training programs in these new approaches to rural studies are scarce.

Offered through campus and field-based experiential education, the graduate minor in Rural Studies provides students with the skills and competencies needed to understand economic, social, political and cultural dynamics of rural places.

The Rural Studies minor complements and supports other programs at OSU including the Master of Public Policy's concentration in rural policy and other graduate programs where students and faculty engage in rural issues such as applied economics, anthropology, forest ecosystems and society, geosciences, and human development and family sciences.

Minor Code: 1080

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>RS 512</td>
<td>INTRODUCTION TO RURAL STUDIES</td>
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<td>RS 513</td>
<td>CONTEMPORARY RURAL ISSUES</td>
<td>2</td>
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<tr>
<td><strong>Electives</strong></td>
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<tr>
<td>Select a minimum of 14 credits from the following:</td>
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<tr>
<td>AEC 554</td>
<td>RURAL DEVELOPMENT ECONOMICS AND POLICY</td>
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<tr>
<td>ANTH 571</td>
<td>CASH, CLASS AND CULTURE: HUNTER-GATHERERS TO CAPITALISM</td>
<td></td>
</tr>
<tr>
<td>ANTH 581</td>
<td>NATURAL RESOURCES AND COMMUNITY VALUES</td>
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<tr>
<td>ANTH 582</td>
<td>ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT</td>
<td></td>
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<tr>
<td>ANTH 584</td>
<td>WEALTH AND POVERTY</td>
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</tr>
<tr>
<td>ANTH 586</td>
<td>ANTHROPOLOGY OF FOOD</td>
<td></td>
</tr>
<tr>
<td>ANTH 599</td>
<td>SPECIAL TOPICS IN ANTHROPOLOGY (Ethnographic Field School)</td>
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<tr>
<td>ANTH 599</td>
<td>SPECIAL TOPICS IN ANTHROPOLOGY (Rural Anthropology)</td>
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<tr>
<td>ENG 582</td>
<td>STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT</td>
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<tr>
<td>ES 544</td>
<td>NATIVE AMERICAN LAW: TRIBES, TREATIES, AND THE U.S.</td>
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<tr>
<td>ES 548</td>
<td>NATIVE AMERICAN PHILOSOPHIES</td>
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<tr>
<td>GEDG 530</td>
<td>RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT</td>
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<td>GEDG 531</td>
<td>GLOBAL RESOURCES AND DEVELOPMENT</td>
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<td>GEDG 550</td>
<td>LAND USE IN THE AMERICAN WEST</td>
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<tr>
<td>GEDG 551</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
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<td>H 520</td>
<td>HEALTH DISPARITIES</td>
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<td>HDFS 547</td>
<td>FAMILIES AND POVERTY</td>
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<td>PS 575</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
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<td>RS 502</td>
<td>INDEPENDENT STUDY</td>
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<td>SNR 520</td>
<td>SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES (Ecampus only)</td>
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<td>SOC 526</td>
<td>SOCIAL INEQUALITY</td>
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<td>SOC 554</td>
<td>LEISURE AND CULTURE</td>
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<td>SOC 556</td>
<td>SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT</td>
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<td>SOC 560</td>
<td>THE SOCIOLOGY OF GLOBALIZATION</td>
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<td>SOC 566</td>
<td>INTERNATIONAL DEVELOPMENT: GENDER ISSUES</td>
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<td>SOC 575</td>
<td>RURAL SOCIOLOGY</td>
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<td>SOC 580</td>
<td>ENVIRONMENTAL SOCIOLOGY</td>
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<td>SOC 581</td>
<td>SOCIETY AND NATURAL RESOURCES</td>
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<tr>
<td><strong>Total Hours</strong></td>
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<td><strong>18</strong></td>
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Minor Code: 1080
## Bioresource Research Undergraduate Major (BS, HBS)

BioResource Research (BRR) is an interdisciplinary biosciences major centered around research aimed at understanding and protecting the planet’s biological resources and exploring their novel and sustainable uses. BRR students complete a comprehensive mentored research experience, in a cutting-edge area of agricultural, biological, chemical, environmental, food, or health science. BRR faculty research mentors come from across OSU, as well as from extension stations and state and federal agencies. Each student’s upper-division curriculum is individualized based on choice of option and research project. In addition to research expertise, BRR students graduate with a strong background in biosciences, job training, and problem-solving and communication skills. These skills lead to careers in industrial or academic research, natural resource management, and graduate and professional programs in the life sciences and medicine.

### Major Code: 113

The BRR curriculum requires biology, chemistry, physics, calculus, statistics, organic chemistry and biochemistry. Students must take an ethics class and a technical writing class. Each student chooses an option (area of concentration) and takes 27 credits of upper-division interdisciplinary coursework based on the option. In addition, students do 14 credits of mentored research, write a thesis, and give a seminar, all for course credit.

Completion of one option is required to earn a degree in Bioresource Research; more may be possible. Course work for EACH option must total 27 credits.

The sample curriculum below allows BRR students to meet the University Baccalaureate Core requirements, the BRR core requirements and their selected option requirements, and graduate with the minimum of 180 credits.

### Course Title

<table>
<thead>
<tr>
<th>Course</th>
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<th>Hours</th>
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<tr>
<td><strong>First Year</strong></td>
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<tr>
<td>Bi 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>Bi 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>Bi 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BRR 100</td>
<td>GREAT EXPERIMENTS IN BIORESOURCE SCIENCES</td>
<td>2</td>
</tr>
<tr>
<td>Ch 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; Ch 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>Ch 232</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; Ch 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>Ch 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; Ch 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
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<tr>
<td>Hhs 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<tr>
<td>Hhs 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
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<tr>
<td>Wr 121</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>Baccalaureate core</td>
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<tr>
<td>Unrestricted electives</td>
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<td><strong>Total Hours</strong></td>
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</table>

| **Second Year** | | |
| Brr 200 | SCIENCE AND RESEARCH | 2 |
| Phl 205 | *ETHICS | 4 |
| Ch 331 | ORGANIC CHEMISTRY | 8 |
| & Ch 332 | ORGANIC CHEMISTRY | 8 |
| Ch 337 | ORGANIC CHEMISTRY LABORATORY | 4 |
| Ph 201 | *GENERAL PHYSICS | 15 |
| & Ph 202 | *GENERAL PHYSICS | 15 |
| & Ph 203 | *GENERAL PHYSICS | 15 |

| **Third Year** | | |
| Bi 311 | GENETICS | 4 |
| Brr 401 | RESEARCH AND SCHOLARSHIP | 8 |
| Comm 111 | *PUBLIC SPEAKING | 3 |
| Mth 251 | *DIFFERENTIAL CALCULUS | 4 |
| or Mth 227 | *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES | 4 |
| Mth 252 | INTEGRAL CALCULUS | 4 |
| or Mth 268 | | |
| Baccalaureate core | | 3 |
| Unrestricted electives | | 5 |

| **Fourth Year** | | |
| Bb 350 | ELEMENTARY BIOCHEMISTRY | 3-4 |
| or Bb 450 | GENERAL BIOCHEMISTRY | 3-4 |
| or Bb 490 | BIOCHEMISTRY 1: STRUCTURE AND FUNCTION | 3-4 |
| Brr 401 | RESEARCH AND SCHOLARSHIP | 6 |
| Brr 403 | *THESIS | 4 |
| Brr 406 | PROJECTS-DATA PRESENTATIONS | 1 |
| Brr 407 | SEMINAR | 1 |
| Brr 409 | PRACTICUM: TEACHING AND PEER MENTORING | 2-4 |
| Wr 327 | *TECHNICAL WRITING | 3 |
| Baccalaureate core | | 3 |
| Unrestricted electives | | 8-9 |

| **Total Hours** | | 181-186 |

1. One option specialization is required (more are often possible). More research may be possible. Course work for EACH option must total 27 credits

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

### Major Code: 113

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
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</tr>
<tr>
<td>Bi 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<tr>
<td>Bi 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>Bi 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<tr>
<td>BRR 100</td>
<td>GREAT EXPERIMENTS IN BIORESOURCE SCIENCES</td>
<td>1</td>
</tr>
<tr>
<td>Ch 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; Ch 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>Ch 232</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; Ch 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
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<tr>
<td>Ch 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
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<tr>
<td>&amp; Ch 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
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<tr>
<td>Hhs 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
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<tr>
<td>Hhs 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
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<tr>
<td>Wr 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>Baccalaureate core</td>
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<td>6</td>
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<tr>
<td>Unrestricted electives</td>
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</tr>
<tr>
<td><strong>Total Hours</strong></td>
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<td>45-46</td>
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</table>

| **Second Year** | | 4 |
| Brr 200 | SCIENCE AND RESEARCH | 1 |
| Phl 205 | *ETHICS | 4 |
| Ch 331 | ORGANIC CHEMISTRY | 4 |
Animal Reproduction and Development Option

This option is offered within the following major(s):
- Bioresource Research - College of Agricultural Sciences (p. 86)

Animal reproduction and development entails the study of life processes in cells, organs, and whole animals to enhance efficient production of high-quality animals and animal food products. Students use antibody-based assays, molecular genetics, protein chemistry, embryo and tissue culture, electron chemistry, and other modern laboratory techniques in research in areas of animal reproduction, development and growth, preparing them for positions or graduate programs in the bioscience/ biomedical/veterinary/agricultural fields.

Option Code: 127

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ANS 121</td>
<td>*INTRODUCTION TO ANIMAL SCIENCES</td>
<td>4</td>
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<tr>
<td>ANS 314</td>
<td>ANIMAL PHYSIOLOGY</td>
<td>4</td>
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<tr>
<td>ANS 316</td>
<td>REPRODUCTION IN DOMESTIC ANIMALS</td>
<td>4</td>
</tr>
</tbody>
</table>

Applied Genetics Option

This option is offered within the following major(s):
- Bioresource Research - College of Agricultural Sciences (p. 86)

Applied genetics is directed at changing the genomes of organisms, to increase their utility to humans. Techniques are derived from cytogenetics, molecular biology, and Mendelian and quantitative genetics. Typically, applied geneticists have expertise in one or more related fields of study such as agronomy, biochemistry, botany, entomology, food processing, forestry, microbiology, pathology, physiology, and statistics.

The goals of applied genetics include:
1. improving the quality of food and fiber products,
2. improving the cost efficiency of a given product, and
3. minimizing adverse environmental effects of food or fiber production.

Students in this option will be well prepared for positions in biosciences and agriculture, or in graduate and professional programs.

Option Code: 114

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBG 430</td>
<td>PLANT GENETICS &amp; PLANT BREEDING</td>
<td>7</td>
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<tr>
<td>ST 411</td>
<td>METHODS OF DATA ANALYSIS</td>
<td>4</td>
</tr>
</tbody>
</table>

Bioproducts and Bioenergy Option

This option is offered within the following major(s):
- Bioresource Research - College of Agricultural Sciences (p. 86)
The Bioproducts and Bioenergy option is concerned with the innovative discovery and production of biomaterials (e.g. biodegradable plastics and composites), bioenergy (e.g. fuel ethanol, hydrogen and biodiesel), or biochemicals (e.g. antibiotics, pharmaceuticals and herbicides) from plant, animal, or microbial biomass. Switching to an economy where the basic building blocks for materials, chemicals, and energy are derived from renewable biological resources could improve health, transform manufacturing practices, increase agricultural productivity, boost rural economies, and mitigate climate change. Students in this option will be prepared for interesting careers in industry and bioinnovation, as well as graduate programs.

Students must choose option classes from four categories, to provide:
1. Background appropriate to the systems that their research concerns (e.g. forests, agricultural crops, microbes);
2. An upper-division laboratory class;
3. A class in economics, business, innovation, or marketing;
4. Specialization and breadth courses, depending on the student’s choice of research.

**Option Code: 815**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Substitution</strong></td>
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</tr>
<tr>
<td>Select BB 314. CELL AND MOLECULAR BIOLOGY for BI 311. GENETICS</td>
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<tr>
<td></td>
<td><strong>Required Courses</strong></td>
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<tr>
<td>Biochemistry</td>
<td>Select BB 450. GENERAL BIOCHEMISTRY for the required biochemistry course (does not add credits)</td>
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<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
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</tr>
<tr>
<td>1. Background Course</td>
<td>Select one course from the following:</td>
<td>3-4</td>
</tr>
<tr>
<td>CROP 330</td>
<td>*WORLD FOOD CROPS</td>
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<tr>
<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
<td></td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
<td></td>
</tr>
<tr>
<td>WSE 210</td>
<td>*RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION</td>
<td></td>
</tr>
<tr>
<td>2. Upper-Division Lab Course</td>
<td>Select one course from the following:</td>
<td>2-4</td>
</tr>
<tr>
<td>BB 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
<td></td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
<td></td>
</tr>
<tr>
<td>3. Economics, Business and Marketing</td>
<td>Select one course from the following:</td>
<td>3-4</td>
</tr>
<tr>
<td>AEC 251</td>
<td>*INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS</td>
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<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<tr>
<td>AEC 351</td>
<td>*NATURAL RESOURCE ECONOMICS AND POLICY</td>
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<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td></td>
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<tr>
<td>BA 362</td>
<td>SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES</td>
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<tr>
<td>BA 390</td>
<td>MARKETING</td>
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<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
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<tr>
<td>FOR 330</td>
<td>FOREST RESOURCE ECONOMICS I</td>
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<tr>
<td>FOR 331</td>
<td>FOREST RESOURCE ECONOMICS II</td>
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</tr>
<tr>
<td>WSE 453</td>
<td>*FOREST PRODUCTS BUSINESS</td>
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</tr>
<tr>
<td>4. Specialization and Breadth Courses</td>
<td>Select courses from below, or other upper-division courses approved by the adviser and research mentor.</td>
<td>11-15</td>
</tr>
<tr>
<td>BA 458</td>
<td>INNOVATION AND NEW PRODUCT DEVELOPMENT</td>
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<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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</tbody>
</table>

**Total credits required for option**: 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Option Code: 815**

**Biotechnology Option**

This option is offered within the following major(s):
- Bioresource Research - College of Agricultural Sciences (p. 86)

Biotechnology refers to laboratory-based techniques such as genetic engineering, recombinant DNA, tissue culture, and horizontal gene transfer, to make or modify products, to improve plants or animals, or to develop useful microorganisms. Examples include gene transfer to increase plant yield or disease resistance; cell and tissue culture to clonally propagate plants or animals; manipulation of microorganisms or cultured cells for the production of fermented food and beverages or the development of vaccines; production of antibodies for detection of animal and plant diseases; drug discovery and development. Students will gain laboratory and/or field experience in modern techniques of biotechnology, preparing them for biosciences or biomedical graduate/professional schools or careers in biotechnology.

**Option Code: 116**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Substituted Courses</strong></td>
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<tr>
<td>BB 490 and BB 491 for BB 450 and BB 451</td>
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<td><strong>Required Courses</strong></td>
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<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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<tr>
<td>BB 491</td>
<td>BIOCHEMISTRY 2: METABOLISM</td>
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<tr>
<td>BB 492</td>
<td>BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY</td>
<td></td>
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<tr>
<td>BB 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
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<tr>
<td>BOT 313</td>
<td>PLANT STRUCTURE</td>
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<tr>
<td>BRR 325</td>
<td>*ENERGY TECHNOLOGY AND SOCIAL CHANGE</td>
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<tr>
<td>CHE 417</td>
<td>INSTRUMENTATION IN CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGINEERING</td>
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<tr>
<td>CHE 445</td>
<td>POLYMERIC ENGINEERING AND SCIENCE</td>
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<tr>
<td>ENGR 350</td>
<td>*SUSTAINABLE ENGINEERING</td>
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<tr>
<td>ENGR 363</td>
<td>*ENERGY MATTERS</td>
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<tr>
<td>FCSJ 361</td>
<td>*FOOD JUSTICE</td>
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<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
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<tr>
<td>FST 430</td>
<td>INNOVATION AND FOOD PRODUCT DEVELOPMENT</td>
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<tr>
<td>MB 310</td>
<td>BACTERIAL MOLECULAR GENETICS</td>
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<tr>
<td>MB 456</td>
<td>MICROBIAL GENETICS AND BIOTECHNOLOGY</td>
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<td>MB 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
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<td>PHAR 537</td>
<td>BIOORGANIC CHEMISTRY</td>
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<td>PS 473</td>
<td>US ENERGY POLICY</td>
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<td>PS 478</td>
<td>RENEWABLE ENERGY POLICY</td>
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<tr>
<td>WSE 324</td>
<td>RENEWABLE MATERIALS LABORATORY</td>
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<tr>
<td>WSE 473</td>
<td>BIOENERGY AND ENVIRONMENTAL IMPACT</td>
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<tr>
<td>WSE 535</td>
<td>POLYMERIC SYNTHESIS AND STRUCTURE</td>
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</table>

**Total credits required for option**: 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
Specialization and Breadth Courses

Select 13 to 15 credits approved by option faculty and research mentor. 13-15

Total Hours 27-30

Option Code: 116

Climate and Biosystems Modeling Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

The Climate and Biosystems Modeling option applies general systems theory to the analysis of climate, environmental and agricultural systems, and their interactions. Systems theory provides a method of analyzing overall system behavior by examining the relations among—and the behavior of—individual components, and synthesizing these relationships into a mathematical framework that describes the total system. Computer simulation using this mathematical framework can predict and analyze the response to various changes in the inputs to, and/or structure of, the system, providing a powerful tool for the development of comprehensive solutions to problems. Examples of topics for student research could include studying the effects of climate change on vector diseases, marine biodiversity, distributions of crops and crop pathogens, the carbon and nitrogen cycles, and wildfire cycles. The option is flexible; students design personalized programs and may complete a double major or minor if desired. This option will prepare students for challenging careers in governmental regulatory agencies and environmental consulting companies, or for graduate programs.

BRR students interested in climate and/or ecosystem research but not modeling should investigate the Sustainable Ecosystems option.

Option Code: 816

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Required Courses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Climate</td>
<td></td>
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<tr>
<td></td>
<td>ATS 420 PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND</td>
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<tr>
<td></td>
<td>CLIMATE CHANGE</td>
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<tr>
<td></td>
<td>or GEOG 323 *CLIMATOLOGY</td>
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<tr>
<td></td>
<td>2. Biosystems</td>
<td>3-4</td>
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<td>Select one course from the following or another appropriate course approved by research mentor:</td>
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<tr>
<td></td>
<td>BI 370 ECOLOGY</td>
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<td>BOT 341 PLANT ECOLOGY</td>
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<td>CE 412 HYDROLOGY</td>
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<td>FE 430 WATERSHED PROCESSES</td>
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<td>FES 341 FOREST ECOLOGY</td>
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<td>FW 320 INTRODUCTORY POPULATION DYNAMICS</td>
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<td>OC 440 BIOLOGICAL OCEANOGRAPHY</td>
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<td>3. Quantitative Modeling</td>
<td>3-4</td>
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<td>Select one from the following:</td>
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<td></td>
<td>BEE 320 BIOSYSTEMS ANALYSIS AND MODELING</td>
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<td></td>
<td>ST 435 QUANTITATIVE ECOLOGY</td>
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<td>ST 443 APPLIED STOCHASTIC MODELS</td>
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<td>4. Computer Programming</td>
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<td>Select one course from the following or another appropriate course approved by research mentor:</td>
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<tr>
<td></td>
<td>CS 151 INTRODUCTION TO PROGRAMMING I WITH EMBEDDED CONTROL LAB</td>
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<tr>
<td></td>
<td>CS 161 INTRODUCTION TO COMPUTER SCIENCE I</td>
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5. Statistics

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<th>Code</th>
<th>Title</th>
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<tr>
<td></td>
<td>ST 411 METHODS OF DATA ANALYSIS</td>
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<td>ST 412 and METHODS OF DATA ANALYSIS</td>
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<tr>
<td></td>
<td>ST 421 INTRODUCTION TO MATHEMATICAL STATISTICS</td>
<td>8</td>
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<tr>
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<td>ST 422 and INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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</table>

Specialization and Breadth Courses

Select 6 to 9 credits approved by research mentor 6-9

Total Hours 36-41

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 816

Environmental Chemistry Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Environmental chemistry focuses on the basic principles that control the fate of chemicals in the environment. A bewildering variety of chemicals, an inevitable result of modern industrial civilization, are released daily; some of them persist in soil, water, or air. The extent to which these chemicals are a health hazard depends in part on where, how much, and in what form they accumulate. OSU scientists use state-of-the-art methods to detect trace amounts of chemicals in the environment, at levels as low as one part per trillion, and track their movement and transformations. Students will acquire laboratory skills that will be in high demand as the worldwide public concern with environmental quality increases.

Option Code: 117

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Substituted Courses</td>
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<tr>
<td></td>
<td>CH 334, CH 335, CH 336 for CH 331, CH 332</td>
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<td></td>
<td>PH 211, PH 212, PH 213 for PH 201, PH 202, PH 203</td>
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<td>Required Courses</td>
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<tr>
<td></td>
<td>CH 390 ENVIRONMENTAL CHEMISTRY</td>
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<td>CH 440 PHYSICAL CHEMISTRY</td>
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<tr>
<td></td>
<td>CSS 305 PRINCIPLES OF SOIL SCIENCE</td>
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<tr>
<td></td>
<td>&amp; CSS 306 and PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS</td>
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<tr>
<td></td>
<td>(EOU campus only)</td>
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<tr>
<td></td>
<td>or SOIL 205 SOIL SCIENCE</td>
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<tr>
<td></td>
<td>MTH 254 QUANTITATIVE ANALYSIS</td>
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<td>Select two courses from the following:</td>
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<tr>
<td></td>
<td>CH 324 QUANTITATIVE ANALYSIS</td>
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<td>CH 421 ANALYTICAL CHEMISTRY</td>
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<td></td>
<td>CH 435 STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS</td>
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<td>CH 440 PHYSICAL CHEMISTRY</td>
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<td>CH 461 EXPERIMENTAL CHEMISTRY I</td>
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<td>SOIL 545 ENVIRONMENTAL SOIL CHEMISTRY</td>
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<td>TOX 430 CHEMICAL BEHAVIOR IN THE ENVIRONMENT</td>
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<td>TOX 490 ENVIRONMENTAL FORENSIC CHEMISTRY</td>
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</table>

Specialization and Breadth Courses

Select 5 to 8 credits approved by option faculty and research mentor 5-8

Total Hours 25-30

Option Code: 117
Food Quality Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Food quality research includes a broad range of studies involving sensory appeal, convenience, safety, and nutrition of food and beverages. The sensory aspects of food quality emphasize taste, texture, aroma, and appearance. The convenience aspects of food quality include shelf-life, ease of preparation, and improved functional properties. Food safety is concerned with acute and chronic responses of consumers to microorganisms and chemicals that occur naturally or are added to foods. Nutritional aspects of food quality are related to the nutrient content of foods and the role of nutrients in human health. Research in these areas is grounded in the application of basic sciences, including biology, chemistry, microbiology, molecular biology, psychology and engineering. Students will acquire skills appropriate for laboratory, industrial, or regulatory positions.

Option Code: 138

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
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<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
<td>3</td>
</tr>
<tr>
<td>FST 422</td>
<td>FOOD CHEMISTRY FUNDAMENTALS</td>
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<tr>
<td>FST 423</td>
<td>FOOD ANALYSIS</td>
<td>4</td>
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<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td><strong>Specialization and Breadth Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 14 credits approved by option faculty and research mentor</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>28</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 138

Genomics/Bioinformatics Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Technological advances in the life sciences have led to a virtual explosion of genomics, proteomics, metabolomics and related ‘omics’ data that give unprecedented global and molecular views of living systems. The Genomics/Bioinformatics Option focuses on computational analyses of these data, using state-of-the-art methods. Computational areas of emphasis within this option include sequence (DNA and protein) analysis and alignment, biological network analysis, and quantitative modeling. Students will be able to use these data to answer research questions and address emerging applications in life sciences, biotechnology, and medicine, and will be prepared for careers or graduate programs in this new, rapidly growing field.

Option Code: 627

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biochemistry/Molecular Biology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td><strong>Computer Science</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3-8</td>
<td></td>
</tr>
<tr>
<td>BOT 476</td>
<td>INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
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<td>27</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Pest Biology and Management Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Pest biology and management involves the study of living organisms, such as insects, fungal and bacterial pathogens, vertebrates, and weeds, that limit agricultural productivity. Students with an interest in entomology may study identification, biology and control of insects, as well as integrated plant protection, biocontrol, and use of beneficial insects. Research approaches range from basic laboratory studies to field experiments. Students will develop research skills in pest biology, development of management strategies, and assessment of pest impact on plants or livestock, preparing them for a variety of regulatory and research positions and graduate programs.
Option Code: 118

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BOT 350</td>
<td>INTRODUCTORY PLANT PATHOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Specialization and Breadth Courses**
Select 12 credits approved by option faculty and research mentor. 12

Total Hours 28

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 118

### Plant Growth and Development Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Plant growth and development involves the study of the control and coordination of processes in cells, organs, and/or whole plants, including, for example, changes in gene expression in response to environmental conditions such as climate change. Students will develop research skills and knowledge about the regulation of plant growth and development, metabolism, structure and function of macromolecules (i.e., enzymes, storage proteins, and nucleic acids), and whole plant physiology, preparing them for agricultural and biosciences positions or graduate programs.

Option Code: 149

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 313</td>
<td>PLANT STRUCTURE</td>
<td>4</td>
</tr>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

Select two of the following: 6-8

- BB 314 | CELL AND MOLECULAR BIOLOGY
- BOT 332 | LABORATORY TECHNIQUES IN PLANT BIOLOGY
- CSS 305 | PRINCIPLES OF SOIL SCIENCE
  & CSS 306 | and PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS (EOU campus only)
  or SOIL 205 | SOIL SCIENCE
- HORT 316 | PLANT NUTRITION

**Specialization and Breadth Courses**
Select 12 to 14 credits approved by option faculty and research mentor. 12-14

Total Hours 26-30

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 149

### Sustainable Ecosystems Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Sustainable Ecosystems research addresses the sustainability of agricultural, forest, rangeland, coastal/marine, and native ecosystems, in which environmental soundness can result from the conscious interaction of humans with wildlife and other components of the systems. The field is multidisciplinary: insights from sociology, political science, anthropology, or philosophy may be combined with concepts from biology, chemistry, and physics to support research. Research projects may cover very diverse interdisciplinary fields; students will acquire appropriate background and perspective by choosing among a broad variety of courses. Students in this option pursue careers in ecological/natural resource research and management, sustainable agriculture, consulting, government agencies, and graduate programs in sciences, policy and law.

Option Code: 142

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 306</td>
<td><strong>ENVIRONMENTAL ECOLOGY</strong></td>
<td>3-4</td>
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<tr>
<td>BI 351</td>
<td>MARINE ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
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<tr>
<td>ENT 420</td>
<td>INSECT ECOLOGY</td>
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<tr>
<td>FES 341</td>
<td>FOREST ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>FW 434/OC 434</td>
<td>ESTUARINE ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>FW 479</td>
<td>WETLANDS AND RIPARIAN ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
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</tr>
</tbody>
</table>

**Ecology**

Select one of the following:

- BI 306 | **ENVIRONMENTAL ECOLOGY**
- BI 351 | MARINE ECOLOGY
- BI 370 | ECOLOGY
- BOT 341 | PLANT ECOLOGY
- ENT 420 | INSECT ECOLOGY
- FES 341 | FOREST ECOLOGY
- FW 434/OC 434 | ESTUARINE ECOLOGY
- FW 479 | WETLANDS AND RIPARIAN ECOLOGY
- RNG 421 | WILDLAND RESTORATION AND ECOLOGY

**Biology and Systematics**

Select one of the following:

- BOT 321 | PLANT SYSTEMATICS
- BOT 414 | AGROSTOLOGY
- BOT 416 | AQUATIC BOTANY
- BOT 461 | MYCOLOGY
- BOT 465 | LICHENOLOGY
- BOT 466 | BRYOLOGY
- CSS 205 | *SOIL SCIENCE (Ecampus only)
- ENT 311 | INTRODUCTION TO INSECT PEST MANAGEMENT
- FES 242 | FOREST PLANTS OF THE PACIFIC NORTHWEST
- FW 302/BI 302 | BIOLOGY AND CONSERVATION OF MARINE MAMMALS
- FW 311 | ORNITHOLOGY
- FW 312 | SYSTEMATICS OF BIRDS
- FW 315 | ICHTHYOLOGY
- FW 316 | SYSTEMATICS OF FISHES
- FW 317 | MAMMALOLOGY
- FW 318 | SYSTEMATICS OF MAMMALS
- FW 321 | ECOLOGY OF MARINE AND ESTUARINE BIRDS
- OC 332 | COASTAL OCEANOGRAPHY
- SOIL 366 | Ecosystems of Wildland Soils
- GEOG 360 | GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY
- Z 365 | BIOLOGY OF INSECTS

**Environmental Methods**

Select one of the following:

- BI 371 | *ECOLOGICAL METHODS
- BI 373 | *FIELD METHODS IN MARINE ECOLOGY
- BI 375 | FIELD METHODS IN ECLOGICAL RESTORATION
- BOT 440 | FIELD METHODS IN PLANT ECOLOGY
- FES 445/FW 445 | ECOLOGICAL RESTORATION
- FW 255 | FIELD SAMPLING OF FISH AND WILDLIFE
- FW 301 | FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION
- GEOG 360 | GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY
**Toxicology Option**

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Toxicology concerns potentially hazardous chemicals in food, drugs, and the environment, and their effects on biological life. Toxicology research encompasses environmental, agricultural, and human-health related areas, and may focus on mechanisms of toxicity, human and environmental risks from exposure, and means for reducing risks. Research could include the movement and bioaccumulation of pesticides and pharmaceuticals in the environment; the effects of specific toxics on humans and animal models; and testing the effects of novel anticancer drugs. Employment opportunities in toxicology include research in academic and industrial fields, product safety evaluation, consulting, public service, and legal regulation. The Toxicology Option also can prepare students to apply for a variety of health and medicine-related graduate and professional programs.

**Option Code: 142**

**Toxicology Option**

Select one Risk Assessment course from the following: 3

- TOX 413 ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT
- TOX 455 ECOTOXICOLOGY: AQUATIC ECOSYSTEMS
- TOX 499 SPECIAL TOPICS (Systems Biological Approaches to Risk Analysis in Environmental Health)

**Option Code: 993**

**Substituted Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>CH 334, CH 335, CH 336 instead of CH 331, CH 332</td>
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</table>

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>TOX 401</td>
<td>counts towards BRR 401</td>
<td></td>
</tr>
</tbody>
</table>

**Select one Risk Assessment course from the following:** 3

- TOX 413 ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT
- TOX 455 ECOTOXICOLOGY: AQUATIC ECOSYSTEMS
- TOX 499 SPECIAL TOPICS (Systems Biological Approaches to Risk Analysis in Environmental Health)

**Specialization and Breadth Courses**

Select 18 credits from the following: 18

- ATS 413 ATOMIC AND MOLECULAR PHYSICS
- BB 360 INTRODUCTION TO NEUROSCIENCE
Water Resources Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (p. 86)

Water resources research involves the use of science and policy tools to identify contaminants and make assessments of water quality. Students will acquire laboratory skills to detect water contaminants and track their movements and transformations while learning related policy and management concerns. Research areas could include microbial contaminants, the impact of urbanization on water quality, and marine and estuarine water quality and its impact on fisheries and shellfish industries. Option course work covers water sciences and hydrology, environmental policy and management. Students completing this option will be prepared for graduate school or for positions in environmental consulting, research, and natural resource management.

Option Code: 993

Another course may be approved by advisor and research mentor

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### Specialization and Breadth Courses

Select four courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 305</td>
<td>PRINCIPLES OF SOIL SCIENCE (EOU campus only)</td>
</tr>
<tr>
<td>or SOIL 205</td>
<td>SOIL SCIENCE</td>
</tr>
<tr>
<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
</tr>
<tr>
<td>GEO 487</td>
<td>HYDROGEOLOGY</td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
</tr>
<tr>
<td>MB 301</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
</tr>
<tr>
<td>MB 456</td>
<td>MICROBIAL GENETICS AND BIOTECHNOLOGY</td>
</tr>
<tr>
<td>MCB 554</td>
<td>GENOME ORGANIZATION, STRUCTURE, AND MAINTENANCE</td>
</tr>
<tr>
<td>MCB 555</td>
<td>GENOME EXPRESSION AND REGULATION</td>
</tr>
<tr>
<td>PHAR 525</td>
<td>FOUNDRATIONS OF DRUG ACTION I</td>
</tr>
<tr>
<td>&amp; PHAR 526</td>
<td>and FOUNDATIONS OF DRUG ACTION II</td>
</tr>
<tr>
<td>&amp; PHAR 527</td>
<td>and FOUNDATIONS OF DRUG ACTION II</td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
</tr>
<tr>
<td>&amp; SOIL 206</td>
<td>and SOIL SCIENCE LABORATORY FOR SOIL 205</td>
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<tr>
<td>SOIL 435</td>
<td>ENVIRONMENTAL SOIL PHYSICS</td>
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<td>SOIL 445</td>
<td>ENVIRONMENTAL SOIL CHEMISTRY</td>
</tr>
<tr>
<td>TOX 429</td>
<td>TOXIC SUBSTANCES IN FOOD</td>
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<tr>
<td>TOX 430</td>
<td>CHEMICAL BEHAVIOR IN THE ENVIRONMENT</td>
</tr>
<tr>
<td>TOX 435</td>
<td>GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
</tr>
<tr>
<td>TOX 490</td>
<td>ENVIRONMENTAL FORENSIC CHEMISTRY</td>
</tr>
<tr>
<td>TOX 499</td>
<td>SPECIAL TOPICS (Molecular Therapeutics)</td>
</tr>
<tr>
<td>TOX 512</td>
<td>TARGET ORGAN TOXICOLOGY</td>
</tr>
<tr>
<td>TOX 575</td>
<td>ADVANCED XENOBIOTIC METABOLISM AND DISPOSITION</td>
</tr>
<tr>
<td>TOX 611</td>
<td>TESTING FOR GENOTOXICITY</td>
</tr>
<tr>
<td>Z 361</td>
<td>INVERTEBRATE BIOLOGY</td>
</tr>
<tr>
<td>&amp; Z 362</td>
<td>and INVERTEBRATE BIOLOGY LABORATORY</td>
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<tr>
<td>Z 422</td>
<td>COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY</td>
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<tr>
<td>Z 425</td>
<td>EMBRYOLOGY AND DEVELOPMENT</td>
</tr>
<tr>
<td>Z 431</td>
<td>VERTEBRATE PHYSIOLOGY I</td>
</tr>
<tr>
<td>&amp; Z 432</td>
<td>and VERTEBRATE PHYSIOLOGY II</td>
</tr>
<tr>
<td>Z 437</td>
<td>VERTEBRATE ENDOCRINOLOGY</td>
</tr>
</tbody>
</table>

Total Hours: 27

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### Watersheds and Hydrology

Choose one course from below:

- CE 412 | HYDROLOGY |
- or FE 430 | WATERSHED PROCESSES |
- FE 430 | WATERSHED PROCESSES |

### Water Resources Environmental Analysis

Select one course from the following:

- BI 371 | *ECOLOGICAL METHODS |
- BOT 547 | NUTRIENT CYCLING |
- CE 413 | GIS IN WATER RESOURCES |
- ENVE 456 | SUSTAINABLE WATER RESOURCES DEVELOPMENT |
- GEDG 441 | INTERNATIONAL WATER RESOURCES MANAGEMENT |
- TOX 455 | ECOTOXICOLOGY: AQUATIC ECOSYSTEMS |

### Water Resources Environmental Policy and Management

Select one course from the following:

- AEC 432 | ENVIRONMENTAL LAW |
- FOR 462 | NATURAL RESOURCE POLICY AND LAW |
- FW 326 | INTEGRATED WATERSHED MANAGEMENT |
- GEDG 440 | WATER RESOURCES MANAGEMENT IN THE UNITED STATES |
- PS 475 | ENVIRONMENTAL POLITICS AND POLICY |
- RNG 455 | RIPARIAN ECOTOXICOLOGY AND MANAGEMENT |

### Specialization and Breadth Courses

1 to 7 additional credits of upper-division courses approved by research mentor, for a total of 29 credits.

Total Hours: 23-34

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### Recommended areas:
- Climatology, geology, resource economics, watersheds, watersheds management, microbial ecology, engineering, mathematics, hydrology, hydrogeology, irrigation, toxicology, ecology, environmental analysis, environmental chemistry, geochemistry, environmental management, environmental policy, economics, marine biology, aquatic and marine botany and zoology, oceanography, statistics, geography, environmental ethics, research ethics.
* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 626

Botany and Plant Pathology

Undergraduate Studies

Botany and plant pathology are concerned with the study of plants at all levels of biological organization, from molecular and cellular processes to the global ecosystem. This breadth of field reflects the wide range of issues and problems that confront plant biologists. In addition to addressing fundamental questions in plant biology, plant scientists in the 21st century will be called upon to provide information useful for producing food, fiber, and medicine for an increasing population, and for increasing our understanding of the diversity of plant and ecological systems and their interactions with humans. Students studying botany and plant pathology at OSU receive the basic science background necessary for such contributions, and may choose to focus in a particular area within plant science.

The undergraduate program in the Department of Botany and Plant Pathology is designed for students who wish to receive a BS in Botany degree and for students pursuing degrees in other fields that require a knowledge of plant biology. For example, students who have an undergraduate major in biology or environmental sciences may wish to emphasize botany courses in their upper-division course work.

Completion of the undergraduate curriculum in botany can qualify students for graduate work in various areas of plant biology and plant pathology, and for positions in state and federal agencies, and industries concerned with plants and their products.

Prospective botany majors should obtain a strong background in the biological and physical sciences at the high school level. Specifically recommended are a minimum of three years of high school mathematics, including algebra, geometry, and some exposure to trigonometry, one year of chemistry, one year of biology, one year of physics, and courses designed to develop computer and writing skills. Students without an adequate background in mathematics and science may make up these deficiencies early in their college careers.

Graduate Studies

The Department of Botany and Plant Pathology offers graduate programs in the following areas of concentration: ecology, genetics, genomics and computational biology, molecular and cellular biology, mycology, plant pathology, plant physiology, and systematics.

Students with majors in any one area may incorporate into their programs minors in other areas within the department or in other departments and colleges. Integrated minors, and interdisciplinary programs in plant physiology, molecular and cellular biology, genetics, and environmental sciences are also available.

The MS and PhD degrees offered by the Department of Botany and Plant Pathology require, in addition to course work, research resulting in presentation and defense of a thesis. A nonthesis MS degree also is available. PhD candidates must pass a written and oral preliminary examination upon completion of their course work. In addition, PhD students are required to be a teaching assistant for two quarters.

Inquiries concerning graduate studies can be forwarded to the chairperson of the department’s Graduate Studies Committee (Andrew.Jones@oregonstate.edu (john.fowler@oregonstate.edu)) and additional details are available online (http://bpp.oregonstate.edu/content/graduate-programs/).

Undergraduate Programs

Major

• Biological Data Sciences (p. 100)
  Options:
  • Genomics (p. 103)
  • Ecological and Environmental Informatics (p. 103)
  • Computational Biology (p. 102)
• Botany (p. 104)
  Options:
  • Comprehensive Botany (p. 107)
  • Customizable (p. 108)
  • Ecology, Evolution, and Conservation (p. 108)
  • Molecular, Cellular, and Genomic Botany (p. 108)
  • Plant Pathology (p. 109)

Minor

• Biological Data Sciences (p. 99)
• Botany (p. 104)

Graduate Programs

Major

• Botany and Plant Pathology (p. 104)

Minor

• Botany and Plant Pathology (p. 104)

Joseph Spatafora, Department Head
2082 Cordley Hall
Oregon State University
Corvallis, OR 97331-2902
Phone: 541-737-3451
Email: bpp-off@science.oregonstate.edu
Website: http://bpp.oregonstate.edu/

Faculty

Professors Behrenfeld, Ciuffetti, Dolja, Fowler, Ingham, Johnson, Liston, McCune, Mundt, Pscheidt, Spatafora, Stone, Tyler, Wolpert
Associate Professors Chang, Goyer, Jaiswal, Jones, Megraw, Milligan, Ocamb, Parke, Santamaria
Assistant Professors Anderson, Busby, Dung, Frost, Graff, Hagerty, Hardison, KC, LeBoldus, Luh, Naithani, Westberry
Senior Instructor Putnam
Instructors Curtis, Link-Perez, Smyth

Courtesy Faculty

Professors Gent, Grunwald, Loper, Martin, Rothwell, Stockey
Associate Professors Hansen, Kentula, Mahaffee, Pyke, Stockwell, Zasada
Assistant Professors Cronn, Grevstad, Kaye, Meinke, Reichman, Weiland
Prerequisites:

Quantitative skills and biological thinking will be used to analyze and identify key assumptions, even when they are not stated explicitly.

Prerequisites: (MTH 251 (may be taken concurrently) with C- or better or MTH 251H (may be taken concurrently) with C- or better) or MTH 227 with C- or better or MTH 241 with C- or better or MTH 245 with C- or better

BDS 311. COMPUTATIONAL APPROACHES FOR BIOLOGICAL DATA. (3 Credits)
Real-world biological datasets to implement fundamental concepts of efficient algorithm design. Synthesize previously acquired knowledge and skills in biology and computer science to analyze, implement, and apply algorithms that process biological datasets, including large-scale datasets.

Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and (MTH 252 [C-] or MTH 252H [C-]) and CS 261 [C-] and (BI 213 (may be taken concurrently) [C-] or BI 213H (may be taken concurrently) [C-]) and (ST 351 (may be taken concurrently) [C-] or ST 351H (may be taken concurrently) [C-])

BDS 406. SPECIAL PROJECTS. (1-99 Credits)
This course is repeatable for 99 credits.

BDS 411. *ANALYSIS OF BIOLOGICAL DATA: CASE STUDIES. (3 Credits)
Case studies; synthesize previously acquired knowledge and skills in biology, mathematics, statistics, and computer science to implement, in writing, an analysis strategy. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

Prerequisites: ((BI 311 with C- or better or BI 311H with C- or better) or (BB 314 with C- or better or BB 314H with C- or better) or MB 310 with C- or better) and (MTH 252 with C- or better or MTH 252H with C- or better) or MTH 228 with C- or better) and (CS 261 with C- or better) and (ST 352 with C- or better)

BDS 491. CAPSTONE PROJECTS IN BIOLOGICAL DATA SCIENCE I. (3 Credits)
Quantitative skills and biological thinking will be used to analyze and draw conclusions from real-world biological datasets. Projects will be completed in the context of small groups. Draws on skills in mathematics, statistics, computer science, and biology in which the students will process their curated datasets and draw conclusions.

Prerequisites: BDS 491 with C- or better

BDS 492. CAPSTONE PROJECTS IN BIOLOGICAL DATA SCIENCE II. (3 Credits)
Quantitative skills and biological thinking will be used to analyze and draw conclusions from biological datasets retrieved in BDS 412. This is a synthesis course that draws skills in mathematics, statistics, computer science, and biology, in which the students will process their curated datasets and draw conclusions.

Prerequisites: BDS 491 with C- or better

BDS 599. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 99 credits.
BOT 325. *INTERSECTIONS BETWEEN PLANTS AND HUMANITY. (3 Credits)
The unique attributes of plants—including aspects of their biochemistry, growth, structure, and physiology—have influenced all aspects of life on earth, from biogeochemical cycles to the rise and expansion of human civilizations. Plants are sources of medicines, stimulants, hallucinogens, fibers and woods, resins and latex, oils and waxes; plants have inspired technological innovation, exploration, and exploitation of people and the environment. This course critically examines the intersections of plants with society and technology by exploring the roles plants have played in both historical and modern contexts. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: One course in biological sciences and junior standing.

BOT 331. PLANT PHYSIOLOGY. (4 Credits)
Survey of physiological processes in plants, including photosynthesis and plant metabolism, mineral nutrition and ion uptake processes, plant cell/water relations, regulation of plant growth and development, and transpiration and translocation. Lec/rec.
Prerequisites: (BI 212 with D- or better or BI 212H with D- or better) and (BI 213 [D] or BI 213H [D-]) or (BI 205 [D] and BI 206 [D-]) and (CH 123 [D-] or (CH 233 [D] and CH 263 [D-]))
Recommended: (BI 213 or BI 213H) and ((CH 123 or (CH 233 and CH 263))

BOT 332. LABORATORY TECHNIQUES IN PLANT BIOLOGY. (3 Credits)
Laboratory experiences in the manipulation and observation of physiological processes in plant systems. Analysis and interpretation of physiological data generated in experimentation with plant systems. Training in basic laboratory skills, including the principles and procedures involved in the use of common items of laboratory instrumentation. Lab.
Recommended: BOT 331 or BI 314 or BB 314

BOT 341. PLANT ECOLOGY. (4 Credits)
Study of higher plants in relation to their environment. The relationship of plant physiology and reproduction to environmental factors; competition and other species interactions; the structure, dynamics and analysis of vegetation. Field trips. Lec/lab.
Recommended: BOT 321 and (BI 213 or BI 213H)

BOT 350. INTRODUCTORY PLANT PATHOLOGY. (4 Credits)
Symptoms, causal agents, diagnosis, and prevention of plant diseases, with emphasis on fungi, bacteria, nematode, and virus pathogens. Lec/lab.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D] or BI 212H [D-]) and (BI 213 [D-] or BI 213H [D-]) or (BI 204 [D-] and BI 205 [D] and BI 206 [D-])

BOT 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 406. PROJECTS: CURATORIAL ASSISTANT. (1-6 Credits)
Students assist with curatorial projects in the OSU Herbarium. Admission is by application to the Department of Botany & Plant Pathology. This course is repeatable for 6 credits.

BOT 407. SEMINAR. (1 Credit)
Section 1: Departmental seminar. Section 2: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.
Equivalent to: BI 407H, BOT 407H
This course is repeatable for 16 credits.

BOT 407H. SEMINAR. (1 Credit)
Section 1: Departmental seminar. Section 3: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BOT 407
This course is repeatable for 16 credits.

BOT 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 413. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 413/FOR 413.
Prerequisites: BI 204 with C or better or BI 212 with C or better or BI 212H with C or better or BI 213 with C or better or BI 213H with C or better
Equivalent to: FOR 413

BOT 414. AGROSTOLOGY. (4 Credits)
Classification and identification of grasses, with emphasis on the modern system of grass classification; laboratory practice in keying grass specimens to genus and species. Lec/lab.
Recommended: BOT 321

BOT 415. AQUATIC BOTANY. (4 Credits)
Taxonomy and ecology of aquatic vegetation, emphasizing freshwater and marine algae and the submergent vascular plants. Morphology, physiology, and classification of the algae; morphological and physiological adaptations of aquatic vascular plants; and primary production in aquatic ecosystems. Laboratory practice in the identification of local taxa. Field trips. Lec/lab.
Recommended: BI 213 or BI 213H

BOT 425. FLORA OF THE PACIFIC NORTHWEST. (3 Credits)
Vascular plant identification, terminology, and diagnostic characteristics of plant families. Lab emphasizes the use of keys for identification to the species level and ability to recognize by sight those plant families found in the Pacific Northwest. Field trips. Lec/lab.
Recommended: BOT 321

BOT 440. FIELD METHODS IN PLANT ECOLOGY. (4 Credits)
Concepts and tools for describing, monitoring, and experimenting on vegetation. Combines Web-based material, field experience at the student’s location, and student projects.
Recommended: Course in ecology and a course in statistics.

BOT 442. PLANT POPULATION ECOLOGY. (3 Credits)
Ecological aspects of plant form and reproduction; demography and population modeling; species interactions, including competition, mutualism, and herbivory. Lec/lab.
Recommended: BOT 341
BOT 458. ECOSYSTEMS GENOMICS. (3 Credits)
Genomic approaches used to understand species interactions with a focus on plant-associated microbes. Learning the conceptual framework and computational techniques of genomics to study the ecology of plant-microbe interactions at the ecosystem level.
Prerequisites: (BI 311 with D- or better or BI 311H with D- or better) and (BI 314 [D-] or BI 314H [D-] or BB 314 [D-] or BB 314H [D-])

BOT 460. FUNCTIONAL GENOMICS. (3 Credits)
Functional genomics describes a set of conceptual approaches and associated laboratory techniques that rely on large-scale DNA sequence datasets to investigate the function of, and interactions between, genes as well as their RNA/protein products. This course will provide an overview of these techniques, including a) approaches to predicting protein function based on sequence analysis, b) large-scale genetic approaches to identifying novel genotype-phenotype associations, and c) transcriptomic, proteomic and metabolomic approaches that reveal gene functions by measuring changes in abundance/modification of associated RNA transcripts, proteins and metabolites.
Prerequisites: (BI 311 with C- or better or BI 311H with C- or better) and (BI 314 [C-] or BI 314H [C-] or BB 314 [C-] or BB 314H [C-])

BOT 461. MYCOLOGY. (5 Credits)
A broad taxonomic survey of the fungi. Topics include life histories, systematics, ecology, genetics, and ethnomycology. Participation on field trips and the submission of a specimen collection are required. Lec/lab. Recommended: (BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or BI 213H)

BOT 465. LICHENOLOGY. (4 Credits)
Biology of lichens; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years. Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 466. BRYOLOGY. (4 Credits)
Biology of bryophytes; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years. Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 475. COMPARATIVE GENOMICS. (4 Credits)
Prerequisites: (BI 311 with D- or better or BI 311H with D- or better or CSS 430 with D- or better) and (BI 314 [D-] or BB 314 [D-] or BB 314H [D-])
Recommended: Basic working knowledge of cell and molecular biology and genetics

BOT 476. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)
Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences.
Recommended: Cell and molecular biology or genetics. Familiarity with text editing software and unix/linux operating system is advantageous

BOT 480. PHOTOSYNTHESIS AND PHOTOBIOLOGY. (3 Credits)
Explores the diverse use of light in biological systems, with particular emphasis on photosynthesis. Lectures will discuss the nature of light, light in the natural environment, light absorption in biological systems, use of light energy for photosynthesis, communication, defense, motility, and vision, as well as deleterious effects of light and its use for global monitoring satellite systems.
Recommended: One course in plant physiology or ecology

BOT 488. ENVIRONMENTAL PHYSIOLOGY OF PLANTS. (3 Credits)
Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. Lec/lab.
Recommended: One course in plant physiology or one course in ecology.

BOT 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BOT 499H
This course is repeatable for 16 credits.

BOT 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BOT 499
This course is repeatable for 16 credits.

BOT 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BOT 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BOT 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 507. SEMINAR. (1-16 Credits)
Section 1: Departmental seminar (F, W, S). Section 2: Communication in Ecology (F). Section 3: Community and Habitat Analyses (W). Section 4: Lichens and Bryophytes Research (S). Weekly one-hour meetings for reporting and discussions of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Graded P/N.
This course is repeatable for 16 credits.

BOT 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 513. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 513/FOR 513.
Equivalent to: FOR 513
Recommended: BI 204 or BI 212 or BI 212H or BI 213 or BI 213H

BOT 514. AGROECOLOGY. (4 Credits)
Classification and identification of grasses, with emphasis on the modern system of grass classification, laboratory practice in keying grass specimens to genus and species. Lec/lab.
Recommended: BOT 321
BOT 516. AQUATIC BOTANY. (4 Credits)
Taxonomy and ecology of aquatic vegetation, emphasizing freshwater and marine algae and the submersed vascular plants. Morphology, physiology, and classification of the algae; morphological and physiological adaptations of aquatic vascular plants; and primary production in aquatic ecosystems. Laboratory practice in the identification of local taxa. Field trips. Lec/lab.
Recommended: BI 213 or BI 213H

BOT 525. FLORA OF THE PACIFIC NORTHWEST. (3 Credits)
Vascular plant identification, terminology and diagnostic characteristics of plant families. Lab emphasizes the use of keys for identification to the species level and ability to recognize by sight those plant families found in the Pacific Northwest. Field trips. Lec/lab.
Recommended: BOT 321

BOT 540. FIELD METHODS IN PLANT ECOLOGY. (4 Credits)
Concepts and tools for describing, monitoring, and experimenting on vegetation. Combines Web-based material, field experience at the student's location, and student projects.
Recommended: Course in ecology and a course in statistics.

BOT 542. PLANT POPULATION ECOLOGY. (3 Credits)
Ecological aspects of plant form and reproduction; demography and population modeling; species interactions, including competition, mutualism, and herbivory. Lec/lab.
Recommended: BOT 341

BOT 543. PLANT COMMUNITY ECOLOGY. (3 Credits)
The structure, diversity, and successional dynamics of terrestrial plant communities; methods of analysis. Lec/lab.
Recommended: BOT 341 or equivalent.

BOT 547. NUTRIENT CYCLING. (3 Credits)
Reviews and discusses ecosystem-level biogeochemical concepts for terrestrial and freshwater ecosystems, primarily by reading and discussing classic and current literature to determine the state-of-knowledge and uncertainties associated with it. Topics include root nutrient uptake mechanisms, soil chemical and biochemical transformations in different soil and ecosystems, measuring soil solution and watershed fluxes, soil organic matter formation and structure, the meaning of sustainability, the concept of N saturation in terrestrial ecosystems, and the use of natural abundance and tracer isotopes in ecosystem biogeochemistry. While forest biogeochemical processes will be emphasized, desert, aquatic, wetland, and prairie ecosystems will also be explored.
Equivalent to: FS 547, SOIL 547
Recommended: College-level chemistry and biology and one class in ecology (eg. BI 370) and/or soils (eg. SOIL 205)

BOT 550. PLANT PATHOLOGY. (5 Credits)
Causal agents of plant disease, diagnosis, pathogenesis, epidemiology, and disease management principles and strategies. Field trip. Lec/lab/rec.
Recommended: BI 213 or BI 213H

BOT 552. PLANT DISEASE MANAGEMENT. (4 Credits)
Analysis of host, pathogen, and environmental factors influencing the increase and spread of plant disease. Epidemiological theory will be used as a basis for developing and evaluating principles and concepts of plant disease management. Lec/lab/rec. Offered alternate years.
Recommended: BOT 350 or BOT 550

BOT 553. PLANT DISEASE DIAGNOSIS. (3 Credits)
Diagnosis of plant diseases and identification of causal agents. Laboratory practice in identification techniques. Observation of symptoms exhibited by diseased plants in greenhouse and field locations. Field trips. Lec/lab. Offered alternate years in summer term.
Recommended: BOT 350 or BOT 550

BOT 554. BIOLOGY OF NEMATODES. (4 Credits)
Survey of basic biology and biodiversity of nematodes. Includes taxonomy, identification, life cycles, ecology and pathology, and interaction with other organisms. Lec/lab. Offered alternate years.
This course is repeatable for 4 credits.
Recommended: Plant pathology

BOT 556. PHYLOGENETICS. (4 Credits)
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Equivalent to: BI 556
Recommended: ST 511

BOT 558. ECOSYSTEMS GENOMICS. (3 Credits)
Genomic approaches used to understand species interactions with a focus on plant-associated microbes. Learning the conceptual framework and computational techniques of genomics to study the ecology of plant-microbe interactions at the ecosystem level.
Recommended: BI 311 and BI 314

BOT 560. FUNCTIONAL GENOMICS. (3 Credits)
Functional genomics describes a set of conceptual approaches and associated laboratory techniques that rely on large-scale DNA sequence datasets to investigate the function of, and interactions between, genes as well as their RNA/protein products. This course will provide an overview of these techniques, including a) approaches to predicting protein function based on sequence analysis, b) large-scale genetic approaches to identifying novel genotype-phenotype associations, and c) transcriptomic, proteomic and metabolic approaches that reveal gene functions by measuring changes in abundance/modification of associated RNA transcripts, proteins and metabolites.
Recommended: (BI 311 or BI 311H) and (BI 314 or BI 314H)

BOT 561. MYCOLOGY. (5 Credits)
A broad taxonomic survey of the fungi. Topics include life histories, systematics, ecology, genetics, and ethnomycology. Participation on field trips and the submission of a specimen collection are required. Lec/lab.
Recommended: (BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or BI 213H)

BOT 565. LICHENOLOGY. (4 Credits)
Biology of lichens; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.
Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 566. BRYOLOGY. (4 Credits)
Biology of bryophytes; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.
Recommended: (BI 213 or BI 213H) and two botany courses.
BOT 570. COMMUNITY STRUCTURE AND ANALYSIS. (4 Credits)
Quantitative methods for the analysis of biotic communities, including community concepts, estimation of community composition parameters, and use of multivariate methods of analyzing species-importance data, and overview of multivariate tools; hands-on computer analysis of data sets. Lec/lab.
Equivalent to: BI 570
Recommended: BI 370 and (ST 412 or ST 512) and calculus

BOT 575. COMPARATIVE GENOMICS. (4 Credits)
Equivalent to: MCB 575
Recommended: Basic working knowledge of cell and molecular biology and genetics. BI 314 and (BI 311 or CSS 430)

BOT 576. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)
Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences. CROSSLISTED as BOT 576/MCB 576.
Equivalent to: MCB 576
Recommended: Cell and molecular biology or genetics. Familiarity with text editing software and unix/linux operating system is advantageous

BOT 580. PHOTOSYNTHESIS AND PHOTOBIOLOGY. (3 Credits)
Explores the diverse use of light in biological systems, with particular emphasis on photosynthesis. Lectures will discuss the nature of light, light in the natural environment, light absorption in biological systems, use of light energy for photosynthesis, communication, defense, motility, and vision, as well as deleterious effects of light and its use for global monitoring satellite systems.
Recommended: One course in plant physiology or ecology

BOT 588. ENVIRONMENTAL PHYSIOLOGY OF PLANTS. (3 Credits)
Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. Lec/lab.
Recommended: One course in plant physiology or ecology

BOT 590. SELECTED TOPICS IN MYCOLOGY. (1-3 Credits)
Advanced topics in mycology through analysis of current literature. Detailed study of an aspect of mycology beyond those covered in regular classes. Seminar and discussion format.
This course is repeatable for 16 credits.
Recommended: BOT 461 or BOT 561

BOT 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

BOT 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BOT 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BOT 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 607. SEMINAR. (1 Credit)
Section 1. Departmental seminar.
This course is repeatable for 16 credits.

BOT 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 651. MOLECULAR BASIS OF PLANT PATHOGENESIS. (3 Credits)
Analysis of current concepts in the physiology, biochemistry, and genetics of host-parasite interactions. Topics covered include specificity, recognition, penetration, toxin production, altered plant metabolism during disease, resistance mechanisms and regulatory aspects of gene expression during host-parasite interactions. Offered alternate years.
Equivalent to: MCB 651
Recommended: BOT 550

BOT 658. PLANT DISEASE DYNAMICS. (4 Credits)
Evaluation of processes affecting the dynamics of plant disease and pathogen populations through analysis of current literature. Students will be expected to conduct extensive reading and analysis of literature and to meet with the instructor for small group discussions. Offered alternate years.
Recommended: BOT 550 and ST 412

BOT 691. SELECTED TOPICS-PLANT ECOLOGY. (1-3 Credits)
Recent advances and developing problems in plant ecology, with critical evaluation of current literature. Topics vary from year to year.
This course is repeatable for 99 credits.
Recommended: Graduate-level ecology.

BOT 692. SELECTED TOPICS-PLANT PATHOLOGY. (1-3 Credits)
Selected topics concerning plant pathogen and plant disease processes, emphasizing current literature and theory. Topics vary from year to year.
Equivalent to: MCB 692
This course is repeatable for 99 credits.
Recommended: BOT 550

BOT 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

**Biological Data Sciences Minor**

Students in the BDS Minor take courses in the life sciences, computer science and statistics.

**Minor Code: 929**

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<thead>
<tr>
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<th>Hours</th>
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<tr>
<td>BI 311</td>
<td>GENETICS</td>
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<td>CS 161</td>
<td>INTRODUCTION TO COMPUTER SCIENCE I</td>
<td>8</td>
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<tr>
<td>CS 162</td>
<td>and INTRODUCTION TO COMPUTER SCIENCE II</td>
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<tr>
<td>ST 411</td>
<td>METHODS OF DATA ANALYSIS</td>
<td>4</td>
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<tr>
<td>BDS 211</td>
<td>USE AND ABUSE OF DATA: CRITICAL THINKING IN SCIENCE</td>
<td>3</td>
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<tr>
<td>BDS 311</td>
<td>COMPUTATIONAL APPROACHES FOR BIOLOGICAL DATA</td>
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<tr>
<td>BDS 411</td>
<td>*ANALYSIS OF BIOLOGICAL DATA: CASE STUDIES (*Case Studies of Bio Data)</td>
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<td>BDS 491</td>
<td>CAPSTONE PROJECTS IN BIOLOGICAL DATA SCIENCE I</td>
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**Upper Division Electives**

Select a minimum of 8 credits from the following, including at least one upper-division course.¹

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</table>

¹ Upper-division courses must be approved by the department.
Biological Data Sciences Undergraduate Major (BS, HBS)

The BDS undergraduate program provides trans-disciplinary education that intersects the life sciences, computer science, statistics, and mathematics.

Major Code: 858

### Biological Science

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<td>BI 211</td>
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<td>&amp; BI 206</td>
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<td>GENETICS</td>
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### Chemistry

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<td>&amp; CH 261</td>
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### Mathematics

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<td>ELEMENTS OF DISCRETE MATHEMATICS</td>
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<td>VECTOR CALCULUS I</td>
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<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
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### Statistics

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### Computer Science

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<td>CS 261</td>
<td>DATA STRUCTURES</td>
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### Biological Data Sciences

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<td>BDS 492</td>
<td>CAPSTONE PROJECTS IN BIOLOGICAL DATA SCIENCE II</td>
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### Experiential Learning

- Independent projects equivalent to at least 60 hours work
  - Required Option: 29-37
  - Total credits required for graduation: 180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Independent projects may be taken as 401 or 410 or not-for-credit
### First Year

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<td>Winter</td>
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<td>Spring</td>
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<td>ELEMENTS OF DISCRETE MATHEMATICS</td>
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</table>

### Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>Fall</td>
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</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS</td>
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<tr>
<td>CS 261</td>
<td>DATA STRUCTURES</td>
<td>4</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<tr>
<td>HHS 231</td>
<td><em>LIFETIME FITNESS FOR HEALTH</em></td>
<td>2</td>
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<tr>
<td>Winter</td>
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<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>EEI Elective: Env.Info</td>
<td></td>
<td>4</td>
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<tr>
<td>ST 411</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>WR 327</td>
<td><em>TECHNICAL WRITING</em></td>
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<td>PAC XXX</td>
<td>Physical Activity Course</td>
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<tr>
<td>Spring</td>
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<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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</tr>
<tr>
<td>ST 412</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>BDS 311</td>
<td>COMPUTATIONAL APPROACHES FOR BIOLOGICAL DATA</td>
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<tr>
<td>Bacc Core</td>
<td>Literature &amp; The Arts</td>
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<tr>
<td>Third Year</td>
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<td>Fall</td>
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<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
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<tr>
<td>BI 311</td>
<td>GENETICS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
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</tr>
<tr>
<td>Bacc Core</td>
<td>Cultural Diversity</td>
<td>3</td>
</tr>
<tr>
<td>Bacc Core</td>
<td>Science, Technology and Society</td>
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<tr>
<td>Winter</td>
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<tr>
<td>EEI Elective: Pop., Comm; Eco.Ecology</td>
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<td>3</td>
</tr>
<tr>
<td>Bacc Core</td>
<td>Western Culture</td>
<td>3</td>
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<tr>
<td>Bacc Core</td>
<td>Social Processes &amp; Institutions</td>
<td>3</td>
</tr>
<tr>
<td>Bacc Core</td>
<td>Difference, Power &amp; Discrimination</td>
<td>3</td>
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<tr>
<td>Bacc Core</td>
<td>Contemporary Global Issues</td>
<td>3</td>
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<tr>
<td>Spring</td>
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<tr>
<td>BI 445</td>
<td>EVOLUTION</td>
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<td>EEI Elective: Phys.EnvSci</td>
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<tr>
<td>MSD 480</td>
<td>ECOSYSTEMS GENOMICS</td>
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<tr>
<td>BDS 411</td>
<td>*ANALYSIS OF BIOLOGICAL DATA: CASE STUDIES</td>
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<td>BOT 401</td>
<td>RESEARCH</td>
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<td>Fourth Year</td>
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<tr>
<td>Fall</td>
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<tr>
<td>EEI Elective: Env.Info</td>
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<tr>
<td>BDS 406</td>
<td>SPECIAL PROJECTS</td>
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<td>Elective</td>
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<tr>
<td>Elective</td>
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<td>4</td>
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<tr>
<td>MTH 427</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td>3</td>
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<tr>
<td>Winter</td>
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<tr>
<td>EEI Elective: Pop., Comm; Eco.Ecology</td>
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<td>Bacc Core</td>
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<td>Bacc Core</td>
<td>Difference, Power &amp; Discrimination</td>
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<td>Bacc Core</td>
<td>Contemporary Global Issues</td>
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<tr>
<td>Spring</td>
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<tr>
<td>EEI Elective: Phys.EnvSci</td>
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<td>4</td>
</tr>
</tbody>
</table>
Computational Biology Option

This option is offered within the following major(s):

- Biological Data Sciences - College of Agricultural Sciences (p. 100)

Students in the Computational Biology Option take classes in computer science, bioinformatics, statistics and mathematical biology.

Option Code: 918

### Code  Title                  Hours

<table>
<thead>
<tr>
<th>Mathematics</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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</tr>
<tr>
<td>MTH 427</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biology/Bioinformatics and Statistics</th>
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</thead>
<tbody>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 427</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td>3</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Biology/Bioinformatics</th>
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</thead>
<tbody>
<tr>
<td>BOT 460</td>
<td>FUNCTIONAL GENOMICS</td>
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<tr>
<td>BOT 458</td>
<td>ECOSYSTEMS GENOMICS</td>
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<tr>
<td>BOT 475</td>
<td>COMPARATIVE GENOMICS</td>
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<tr>
<td>CS 446</td>
<td>NETWORKS IN COMPUTATIONAL BIOLOGY</td>
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<table>
<thead>
<tr>
<th>Statistics</th>
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</thead>
<tbody>
<tr>
<td>ST 413</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>ST 415</td>
<td>DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS</td>
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</tr>
<tr>
<td>ST 431</td>
<td>SAMPLING METHODS</td>
<td></td>
</tr>
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</table>

Other course with advisor approval

### Computer Science
Advanced Computer Science
Select at least three courses from the following:

- CS 331 INTRODUCTION TO ARTIFICIAL INTELLIGENCE
- CS 361 SOFTWARE ENGINEERING I
- CS 362 SOFTWARE ENGINEERING II
- CS 420 GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE
- CS 434 MACHINE LEARNING AND DATA MINING
- CS 458 INTRODUCTION TO INFORMATION VISUALIZATION
- CS 475 INTRODUCTION TO PARALLEL PROGRAMMING
- Other course with advisor approval

Total Hours: 29-33

Option Code: 918

Ecological and Environmental Informatics Option

This option is offered within the following major(s):

- Biological Data Sciences - College of Agricultural Sciences (p. 100)

Students in the Ecological and Environmental Informatics Option take classes in general, population and community ecology.

Option Code: 917

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 420</td>
<td>MODELS AND METHODS OF APPLIED MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>or MTH 427</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>or ST 415</td>
<td>DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS</td>
<td></td>
</tr>
</tbody>
</table>

General Ecology

- BI 370 ECOLOGY 3

Molecular Ecology

- BOT 458 ECOSYSTEMS GENOMICS 3

Population, Community & Ecosystem Ecology

Select three courses from the following, including at least one course from Group A and one course from Group B:

Group A

- BI 351 MARINE ECOLOGY
- BI 358 SYMBIOSES AND THE ENVIRONMENT
- BI 481 BIOGEOGRAPHY
- BI 495 DISEASE ECOLOGY
- BOT 341 PLANT ECOLOGY
- BOT 413 FOREST PATHOLOGY
- BOT 440 FIELD METHODS IN PLANT ECOLOGY
- FEIS 341 FOREST ECOLOGY
- FW 321 APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY
- FW 456 FRESHWATER ECOLOGY AND CONSERVATION
- FW 470 WETLANDS AND RIPARIAN ECOLOGY

Group B

- BI 483 POPULATION BIOLOGY
- BOT 442 PLANT POPULATION ECOLOGY
- FW 320 INTRODUCTORY POPULATION DYNAMICS

Other course with advisor approval

Physical Environmental Science

Select one course from the following:

- CSS 205 *SOIL SCIENCE
- ATS 201 *CLIMATE SCIENCE
- GEO 202 *EARTH SYSTEMS SCIENCE

Total Hours: 32-37

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 914

Genomics Option

This option is offered within the following major(s):

- Biological Data Sciences - College of Agricultural Sciences (p. 100)

Students in the Genomics Option complete courses in chemistry, genomics, and molecular biology.

Option Code: 914

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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</tr>
<tr>
<td>&amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 232</td>
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</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
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<tr>
<td>&amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233</td>
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</tr>
<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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</tr>
<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
<td>4</td>
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</tbody>
</table>

General Biochemistry

- BB 450 GENERAL BIOCHEMISTRY 4
- BB 451 GENERAL BIOCHEMISTRY 3

Molecular Biology

- BB 314 CELL AND MOLECULAR BIOLOGY 4

Advanced Molecular, Cell, Organismal or Physiology

Select one course from the following:

- BOT 331 PLANT PHYSIOLOGY
- BB 460 ADVANCED CELL BIOLOGY
- BB 484 CHROMATIN AND EPIGENETICS
- BB 493 BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES I
- MB 302 GENERAL MICROBIOLOGY
  & MB 303 GENERAL MICROBIOLOGY LABORATORY
- Z 425 EMBRYOLOGY AND DEVELOPMENT
- Z 437 VERTEBRATE ENDOCRINOLOGY
- Z 438 BEHAVIORAL NEUROBIOLOGY
Other course with advisor approval

**Genomics**
Select two courses from the following: 6-8

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>BOT 476</td>
<td>INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES</td>
</tr>
<tr>
<td></td>
<td>(recommended as first course for Genomics option)</td>
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<tr>
<td>BOT 458</td>
<td>ECOSYSTEMS GENOMICS</td>
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<tr>
<td>BOT 460</td>
<td>FUNCTIONAL GENOMICS</td>
</tr>
<tr>
<td>BOT 475</td>
<td>COMPARATIVE GENOMICS</td>
</tr>
<tr>
<td>BB 485</td>
<td>APPLIED BIOINFORMATICS</td>
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<tr>
<td>MB 420</td>
<td>MICROBIAL GENOMES, BIODEOCHIMISTRY, AND DIVERSITY</td>
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<tr>
<td>ST 415</td>
<td>DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS</td>
</tr>
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</table>

Other course with advisor approval

Total Hours 38-42

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**Option Code: 914**

**Botany and Plant Pathology Graduate Major (MS, PhD)**

**Graduate Areas of Concentration**

Ecology, genetics, genomics and computational biology, molecular and cellular biology, mycology, plant pathology, plant physiology, systematics

The Department of Botany and Plant Pathology offers graduate programs leading to the Master of Science, and Doctor of Philosophy degrees in the field of botany and plant pathology.

Within this major field, students may elect to specialize in one of the approved areas of concentration.

The selection of an area of concentration is optional. Students may major in botany and plant pathology without selecting an area of concentration.

The approved areas of concentration are described below.

- **Ecology** includes physiological, population, community, ecosystem and global studies in ecology.
- **Genetics** includes molecular, classical and population studies of the genetics of plants, fungi, and plant-associated microorganisms.
- **Genomics and computational biology** include the functional, comparative and structural study of plant, fungal, viral and bacterial genomes and the development and application of bioinformatic algorithms and tools used in the analysis of genomic data.
- **Molecular and cellular biology** include studies of molecular and cellular mechanisms active during plant development, molecular aspects of plant-pathogen interactions, and various aspects of gene regulation, signal transduction, and the cytoskeleton.
- **Mycology** includes the systematics, ecology, and population genetics of lichenized and nonlichenized fungi.
- **Plant pathology** includes studies in the areas of bacteriology, nematology, virology, forest pathology, epidemiology of plant diseases, the physiology of parasitism, and the molecular and biochemical basis of plant host-pathogen interactions.
- **Plant physiology** includes investigations of the regulation of plant growth and development, the molecular and physiological basis of plant-microbe interactions, nitrogen metabolism and the nitrogen cycle, and problems in environmental and stress physiology in plant systems.
- **Systematics** includes investigations of the taxonomy, phylogeny, and biogeography of plants, fungi, and lichens.

Students majoring in any one area of concentration may incorporate into their programs minors in other areas within the department or minors in other departments and colleges. Integrated minors, and interdisciplinary programs in plant physiology, molecular and cellular biology, genetics, and environmental sciences are also available.

The MS and PhD degrees offered by the Department of Botany and Plant Pathology require, in addition to course work, research resulting in the presentation and defense of a thesis. A nonthesis MS degree also is available for students with specific career goals. PhD candidates must pass a preliminary examination upon completion of their course work. In addition, PhD students are required to be a teaching assistant for two quarters.

Inquiries concerning graduate studies may be forwarded to the chair of the department’s Graduate Studies Committee (Andrew.Jones@oregonstate.edu (john.fowler@oregonstate.edu)). Additional details available on the BPP website (https://bpp.oregonstate.edu/bpp/academics/graduate-programs/).

**Major Code: 5160**

**Botany and Plant Pathology Graduate Minor**

**Minor Code: 5160**

**Botany Minor**

**Also available via Ecampus.**

**Minor Code: 515**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 311</td>
<td>GENETICS</td>
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<tr>
<td>or PBG 430</td>
<td>PLANT GENETICS</td>
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<tr>
<td>BOT 321</td>
<td>PLANT SYSTEMATICS</td>
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</tr>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
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<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
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<tr>
<td>Select 11-12 credits of additional upper-division BOT courses</td>
<td>11-12</td>
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</tbody>
</table>

Total Hours 26-28

1 Excluding BOT 101 but may include BOT 401, BOT 405, BOT 407, BOT 410

The minor requirements listed above are subject to the following constraints:

Courses required for a major and taken in the major department may not count toward a minor. An individual course may not count toward more than one minor. At least 12 credits of the minor must be upper division.

**Minor Code: 515**

**Botany Undergraduate Major (BS, HBS)**

**Also available via Ecampus.**
Botany and plant pathology are concerned with the study of plants at all levels of biological organization, from molecular and cellular processes to the global ecosystem. This breadth of field reflects the wide range of issues and problems that confront plant biologists. In addition to addressing fundamental questions in plant biology, plant scientists in the 21st century will be called upon to provide information useful for producing food, fiber, and medicine for an increasing population, and for increasing our understanding of the diversity of plant and ecological systems and their interactions with humans. Students studying botany and plant pathology at OSU receive the basic science background necessary for such contributions, and may choose to focus in a particular area within plant science.

The undergraduate program in the Department of Botany and Plant Pathology is designed for students who wish to receive a BS in Botany degree and for students pursuing degrees in other fields that require a knowledge of plant biology. For example, students who have an undergraduate major in biology or environmental sciences may wish to emphasize botany courses in their upper-division course work.

Completion of the undergraduate curriculum in botany can qualify students for graduate work in various areas of plant biology and plant pathology, and for positions in state and federal agencies, and industries concerned with plants and their products.

Prospective botany majors should obtain a strong background in the biological and physical sciences at the high school level. Specifically recommended are a minimum of three years of high school mathematics, including algebra, geometry, and some exposure to trigonometry, one year of chemistry, one year of biology, one year of physics, and courses designed to develop computer and writing skills. Students without an adequate background in mathematics and science may make up these deficiencies early in their college careers.

**Major Code: 515**

The required curriculum meets the course requirements of the university and the College of Agricultural Sciences and provides for a broad background in plant science. Completing an option and engaging in an experiential learning activity allows students to fulfill their individual education goals and prepare for career aspirations.

All Botany undergraduate majors are required to do the following:

1. Complete the core course curriculum meeting the requirements of the university, College of Agricultural Sciences, and Botany academic requirements.
2. Select and complete the course curriculum of a 21-credit option to obtain advanced scientific background and skills in a particular area of plant science. Students may select a pre-determined botany option from the catalog or create a customized option with approval of a BOT advisor. Course work delivered in the options provides students with advanced knowledge and skills related to the study of plants and plant-like organisms in natural and managed ecosystems and in the laboratory.
   1. Comprehensive Botany
   2. Customizable Option
   3. Ecology, Evolution, and Conservation
   4. Molecular, Cellular, and Genomic Botany
   5. Plant Pathology
3. Participate in an experiential learning and subsequent student seminar. Every Botany major is required to have an experiential learning (EL) component in their curriculum that is not part of a scheduled academic course. The EL component can take many forms but must involve a minimum of 60 hours of work and must have a substantial educational objective that is related to the BOT degree. Academic credit is not required but may be earned by enrolling in research (BOT 401) or internship (BOT 410). Paid and voluntary positions are both acceptable. To meet the requirement, the student and the EL supervisor must make a written agreement that is approved by a Botany advisor. After completion of the EL project, the student is required to participate in a 1-credit student seminar during Fall term of the senior year (BOT 407), to reflect on the EL project and to incorporate it into future career planning activities.
Botany Undergraduate Major (BS, HBS)

CH 331  ORGANIC CHEMISTRY  8
& CH 332 and ORGANIC CHEMISTRY

Biochemistry
Select one of the following:  4-7
BB 350  ELEMENTARY BIOCHEMISTRY
BB 450  GENERAL BIOCHEMISTRY
& BB 451 and GENERAL BIOCHEMISTRY

Mathematics
Select 8 credits of the following:  8
MTH 111  *COLLEGE ALGEBRA
MTH 112  *ELEMENTARY FUNCTIONS
MTH 231  ELEMENTS OF DISCRETE MATHEMATICS
MTH 241  *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE
MTH 245  *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES
MTH 251  *DIFFERENTIAL CALCULUS
MTH 252  INTEGRAL CALCULUS

Statistics
ST 351  INTRODUCTION TO STATISTICAL METHODS  4

Additional Quantitative Skills
Select a minimum of two courses from the following:  7-9
BOT 476  INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES
CS 161  INTRODUCTION TO COMPUTER SCIENCE I
CS 162  INTRODUCTION TO COMPUTER SCIENCE II
GEOG 360  GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY
GEOG 361  GISCIENCE II: ANALYSIS AND APPLICATIONS
PH 201  *GENERAL PHYSICS
PH 265  SCIENTIFIC COMPUTING
ST 352  INTRODUCTION TO STATISTICAL METHODS
ST 411  METHODS OF DATA ANALYSIS

Writing Intensive Course
Select one course from the following:  3-4
BI 371  *ECOLOGICAL METHODS
BOT 323  *FLOWERING PLANTS OF THE WORLD
HSTS 415  **THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY
HSTS 419  **STUDIES IN SCIENTIFIC CONTROVERSY: METHODS AND PRACTICES
HSTS 425  **HISTORY OF THE LIFE SCIENCES
MB 311  *MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE

Botany Core Courses
BOT 220  *INTRODUCTION TO PLANT BIOLOGY  4
BOT 313  PLANT STRUCTURE  4
BOT 321  PLANT SYSTEMATICS  4
BOT 331  PLANT PHYSIOLOGY  4
BOT 332  LABORATORY TECHNIQUES IN PLANT BIOLOGY  3
BOT 341  PLANT ECOLOGY  4
BOT 407  SEMINAR  1
Select one non-vascular plant course from the following:  4-5
BOT 416  AQUATIC BOTANY
BOT 461  MYCOLOGY
BOT 465  LICHENOLOGY
BOT 466  BRYOLOGY

Transcript Visible Option Courses  1  21
Free Elective Courses  2  23-29
Total credits required for graduation  180

1 Includes 21 credits of coursework in fulfillment of one of the BOT transcript-visible options
2 Students are encouraged to speak with an academic advisor to ensure that electives best fit the desired career path or interests

Major Code: 515

This outline is generally valid for students pursuing any of the botany options. Certain major requirements can be fulfilled by taking courses from each SELECT menu, such as the Math requirement, Additional Quantitative Skills, WIC, and Non-vascular plants. For clarity, the term-by-term map does not show all of these choices, which are dictated by a student's math placement, interests, and option. At least one of each type of course requirement is shown in the plan, and the full menus are provided at the end of the term-by-term. Students should be aware that some of these courses are needed to fulfill requirements for specific options. Students should also be aware that the Experiential Learning requirement should be completed before the start of the senior year.

Course  Title  Hours
First Year
Fall
BI 211  *PRINCIPLES OF BIOLOGY  4
or BI 204 or *INTRODUCTORY BIOLOGY I

Select one of the following:  5
CH 121  GENERAL CHEMISTRY
CH 231  GENERAL CHEMISTRY
& CH 261 and *LABORATORY FOR CHEMISTRY 231
MTH 111  *COLLEGE ALGEBRA  4
or MTH 112 or *ELEMENTARY FUNCTIONS
or MTH 231 or ELEMENTS OF DISCRETE MATHEMATICS
WR 121  *ENGLISH COMPOSITION  3

Approved Speech (COMM) course

Spring
BI 213  *PRINCIPLES OF BIOLOGY  4
or BI 206 or *INTRODUCTORY BIOLOGY II

Select one of the following:  5
CH 122  *GENERAL CHEMISTRY
CH 232  GENERAL CHEMISTRY
& CH 262 and *LABORATORY FOR CHEMISTRY 232
MTH 241  *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE  4
or MTH 245 or *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES
or MTH 251 or *DIFFERENTIAL CALCULUS

Perspective course  3

Second Year
Fall
BOT 220  *INTRODUCTION TO PLANT BIOLOGY  4
CH 331  ORGANIC CHEMISTRY  4
HHS 231  *LIFETIME FITNESS FOR HEALTH  2

Additional approved writing (WR II) course  3

Approved Speech (COMM) course

Total credits required for graduation  180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
Winter
BB 314  CELL AND MOLECULAR BIOLOGY  4
BOT 313  PLANT STRUCTURE  4
CH 332  ORGANIC CHEMISTRY  4
HHS 241  *LIFETIME FITNESS (or any PAC course)  1-2
Perspectives course  3

Hours  16-17

Spring
BOT 321  PLANT SYSTEMATICS  4
ST 351  INTRODUCTION TO STATISTICAL METHODS  4
Perspectives course  3
Approved elective, including credits towards the selected option  3

Hours  14

Third Year
Fall
BB 450  GENERAL BIOCHEMISTRY  4
BOT 461  MYCOLOGY  5
Synthesis course  3
Approved elective, including credits towards the selected option  3

Hours  15

Winter
BB 451  GENERAL BIOCHEMISTRY  3
Select one of the following:  4
BI 311  GENETICS
PBG 430  PLANT GENETICS
& PBG 431  PLANT GENETICS RECITATION
BOT 323  *FLOWERING PLANTS OF THE WORLD (or other approved WIC course)  3
Approved electives, including credits towards the selected option  6

Hours  16

Spring
BB 350  ELEMENTARY BIOCHEMISTRY (For those who did not take BB 450 and BB 451)  4
BOT 331  PLANT PHYSIOLOGY  4
Perspectives courses  3
Synthesis course  3
Approved elective, including credits towards the selected option  3

Note: Students should complete experiential learning activity before the beginning of the Fourth Year

Hours  17

Fourth Year
Fall
BOT 407  SEMINAR (for senior undergraduates)  1
CS 161  INTRODUCTION TO COMPUTER SCIENCE I (or other approved quantitative skills course)  4
Approved electives, including those for selected option  10-12

Hours  15-17

Winter
BOT 332  LABORATORY TECHNIQUES IN PLANT BIOLOGY  3
ST 352  INTRODUCTION TO STATISTICAL METHODS (or other approved quantitative skills course)  4
Approved electives, including those for selected option  8-10

Hours  15-17

Spring
BOT 341  PLANT ECOLOGY  4
BOT 465  LICHENOLOGY (For students who did not take BOT 461, Mycology)  4
or BOT 466  BRYOLOGY
Approved electives, including those for selected option  7-10

Hours  15-18

Total Hours  184-192

1 8 Mathematics credits should be taken during the First Year. Path depends on student’s Math Placement score. All students must complete through MTH 112 during the First Year. Specific options require high-level math courses.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Comprehensive Botany Option

This option is offered within the following major(s):

- Botany - College of Agricultural Sciences (p. 104)

The Comprehensive Botany option is aimed at the student who wants broadly-based and high-level botanical knowledge and skills appropriate for botany careers and graduate education.

Option Code: 932

The Comprehensive Botany option requires 16–17 credits of 400-level BOT courses that provide a broad and sophisticated education in the five learning objectives of the botany core: structure, systematics, ecology, physiology, and genomics (list A). These courses cover aquatic botany, a second course in non-vascular plants, plant population ecology, environmental physiology/photosynthesis, and genome-enabled plant biology. Students choose an additional 4–5 credits of course work with permission of the advisor. These courses may be BOT advanced courses or courses in other departments (e.g., BI, BB, CROP, CSS, HORT, PBG). Up to 3 credits of approved Experiential Learning can also be applied to the option.

Code Title Hours

A. Courses Required for Option

Plant Structure/Diversity/Systematics

BOT 416  AQUATIC BOTANY  4
Select one of the following:  4-5
BOT 461  MYCOLOGY
BOT 465  LICHENOLOGY
BOT 466  BRYOLOGY

Plant Ecology

BOT 442  PLANT POPULATION ECOLOGY  3

Plant Physiology/Biochemistry

BOT 480  PHOTOSYNTHESIS AND PHOTOBIOLOGY  3
or BOT 488  ENVIRONMENTAL PHYSIOLOGY OF PLANTS

Plant Genomics

Select one of the following:  3-4
BOT 458  ECOSYSTEMS GENOMICS
BOT 460  FUNCTIONAL GENOMICS
BOT 475  COMPARATIVE GENOMICS

B. Electives

Select additional 4-5 credits from BOT or other courses with permission of advisor  4-5

Total Hours  21-24

1 One elective may double count for another BCC or BOT requirement, such as a Bacc Core synthesis course or an additional quantitative skills class.

Up to 3 credits of approved Experiential Learning can be applied in this category.

Option Code: 932
Customizable Option

This option is offered within the following major(s):

• Botany - College of Agricultural Sciences (p. 104)

Also available via Ecampus.

The Customizable option is for students who have well-defined educational goals and career aspirations that do not fit easily within the existing options. The Customizable option allows students to have a transcript-visible program of upper-division courses that are tailored to their particular interests and professional objectives.

Option Code: 931

To create a customizable option, the student must do the following:

1. Define career goals and objectives.
2. Articulate a custom option title that briefly encompasses those professional goals (title is not transcripted).
3. Work with the botany advisor to create a program of courses for the option. The course program should meet all of these criteria:
   1. minimum of 21 credits, at least 15 being upper division
   2. all program courses must be taken for a grade (no S/U)
   3. courses may not double count with the BOT degree core requirements except for a WIC course or an “additional quantitative skills” course
4. a maximum of 3 credits of experiential learning units may be applied
5. up to 9 transfer credits may be applied with advisor approval
4. Plan how the courses will be scheduled, so that the option can be completed in a timely way. Remember that some courses are offered on an alternate year basis.
5. Write a one-page proposal that describes the career goals and outlines how each course in the program will relate to those goals.
6. Fill out a Customizable option form and submit it to your advisor along with your proposal. The advisor will review the plan and either approve it or make recommendations for revision.
7. When the plan is approved (signed), the course program needs to be submitted to MyDegrees. The Customizable option courses will appear below the Major Block under “student program of study”.
8. The Customizable option plan is locked, but can be modified if necessary, in consultation with your advisor.

Option Code: 931

Ecology, Evolution, and Conservation Option

This option is offered within the following major(s):

• Botany - College of Agricultural Sciences (p. 104)

The option in Ecology, Evolution, and Conservation (EEC) combines 4 required advanced BOT undergraduate courses in aspects of ecology, environmental plant physiology, and plant diversity, with at least 3 elective courses drawn from a list of BOT, BI, FES, FW and ST courses covering population dynamics, symbiosis, restoration, and conservation. To encourage students in the option to learn actively and obtain practical skills, up to 3 credits of approved Experiential Learning can be applied to the option. The EEC option courses are all approved electives within the BOT major. The core course requirements of the BOT major are not changed by doing the option, and no additional course credits are required to complete it.

Option Code: 934

The total requirements of the Botany Core are shown in the university catalog. The BOT core includes courses in ecology, physiology, evolution, systematics, statistics, and genetics that form the general background in this area of botany. Outside of the core courses, the option required courses (A list) include advanced physiology and ecology courses, a WIC course (BOT 323 or BI 371) can be used for both WIC and option requirements, and a choice plant diversity courses. The B list electives offer the student a broad range of theoretical, applied, molecular, and quantitative classes.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BOT 323</td>
<td>*FLOWERING PLANTS OF THE WORLD or BI 371</td>
<td>^ECOLOGICAL METHODS</td>
</tr>
<tr>
<td>BOT 416</td>
<td>AQUATIC BOTANY or BOT 425</td>
<td>FLORA OF THE PACIFIC NORTHWEST</td>
</tr>
<tr>
<td>BOT 442</td>
<td>PLANT POPULATION ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BOT 488</td>
<td>ENVIRONMENTAL PHYSIOLOGY OF PLANTS</td>
<td>3</td>
</tr>
<tr>
<td>BI 301</td>
<td>*HUMAN IMPACTS ON ECOSYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>BI 358</td>
<td>SYMBIOSIS AND THE ENVIRONMENT</td>
<td>3</td>
</tr>
<tr>
<td>BI 456</td>
<td>PHYLOGENETICS</td>
<td>3</td>
</tr>
<tr>
<td>BOT 475</td>
<td>COMPARATIVE GENOMICS</td>
<td>3</td>
</tr>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
<td>3</td>
</tr>
<tr>
<td>FES 452/FW 452</td>
<td>BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
<td>3</td>
</tr>
<tr>
<td>FW 320</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
<td>3</td>
</tr>
<tr>
<td>FW 321</td>
<td>APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY</td>
<td>3</td>
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</tbody>
</table>

B. Select at least 9 additional credits of the following:

Up to 3 credits of approved Experiential Learning

Other courses with advisor approval

Total Hours: 21-22

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 934

Molecular, Cellular, and Genomic Botany Option

This option is offered within the following major(s):

• Botany - College of Agricultural Sciences (p. 104)

The option in Molecular, Cellular, and Genomic Botany (MCG) is designed for Botany undergraduates with career interests in molecular, cellular and genomic biology, by providing a curriculum that provides them with specialized knowledge and skills for work and graduate school.

Option Code: 935

In addition to the general Botany curriculum, the MCG option requires 6 credits of advanced background courses in biochemistry and bio-computing (list A); a choice of two advanced BOT courses in plant genomics and biochemistry (6–7 credits) (list B); and a choice of 3 courses (9 credits) drawn from a menu of advanced BOT, BI, BB courses in cell biology, molecular biology and genomics (lists B and C). To
encourage students in the option to learn actively and obtain practical skills, up to 3 credits of approved Experiential Learning can be applied to the option. Other courses may be substituted for list C with approval of a BOT advisor. The required course, BOT 476, can also be used to fulfill the major requirement for ‘additional quantitative skills’. The core course requirements of the BOT major are not changed by doing the option, and no additional course credits are required to complete it.

### General Biology (BB 450 is a prerequisite)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY (BB 450 is a prerequisite)</td>
<td>3</td>
</tr>
<tr>
<td>BB 476</td>
<td>INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES</td>
<td>3</td>
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</tbody>
</table>

### B. Select at least two Advanced Plant Molecular, Cellular, and Genomic Botany (MCG) from the following: 6-7

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 458</td>
<td>ECOSYSTEMS GENOMICS</td>
<td></td>
</tr>
<tr>
<td>BB 460</td>
<td>FUNCTIONAL GENOMICS</td>
<td></td>
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<tr>
<td>BB 475</td>
<td>COMPARATIVE GENOMICS</td>
<td></td>
</tr>
<tr>
<td>BB 480</td>
<td>PHOTOSYNTHESIS AND PHOTOBIOLOGY</td>
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</table>

### C. Select at least 9 credits of Advanced General Molecular & Cellular Biology (MCB) from the following: 9

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 315/B 315</td>
<td>MOLECULAR BIOLOGY LABORATORY or BB 493</td>
<td>3</td>
</tr>
<tr>
<td>or BB 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
<td></td>
</tr>
<tr>
<td>BB 460</td>
<td>ADVANCED CELL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BB 484</td>
<td>CHROMATIN AND EPIGENETICS</td>
<td></td>
</tr>
<tr>
<td>BB 486</td>
<td>ADVANCED MOLECULAR GENETICS</td>
<td></td>
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</tbody>
</table>

Other courses with advisor approval

**Option Code:** 935

### Plant Pathology Option

This option is offered within the following major(s):

- Botany - College of Agricultural Sciences (p. 104)

The Plant Pathology option (PP) combines plant pathology, microbiology, mycology and entomology to provide botany students with necessary additional background to pursue careers in this important field. The courses are drawn from upper-division undergraduate offerings in botany, microbiology, entomology and forestry (FES). To encourage students in the option to learn actively and obtain practical skills, up to 3 credits of approved experiential learning can be applied to the option. The PP option credits are drawn from approved elective course credits. The core course requirements of the BOT major are not changed by doing the option, and no additional course credits are required to complete it.

**Option Code:** 935

The total requirements of the Botany Core are shown in the university catalog. The BOT core includes courses in plant structure, ecology, physiology, evolution, systematics, statistics, and genomics that form the botanical background for this field. Outside of the core courses, BOT majors have 44–49 elective credits that can be chosen from a group of approved courses. Up to 16 credits of the PP option can be drawn from the approved electives. The 5 credits of mycology (BOT 461) also fulfill the BOT requirement for a non-vascular plant course.

### Crop and Soil Science Department

The discipline of crop science provides the knowledge and understanding of technologies that contribute directly to improvements in production and quality of food, feed, fiber, seed, energy, and nutraceutical crops for the world. The art and science of plant improvement are key elements in efforts to feed, clothe and provide energy for the world’s ever-growing population. Conventional and molecular tools assist in the development of new genetic strains of food and energy crops. Crop plants play an important role in the future of sustainable food and energy production.

The discipline of soil science provides the basic understanding of the physical, chemical, and biological properties of this important natural resource. Why is soil important? Soil is the fundamental substrate for life on terrestrial landscapes. Soil plays a vital role in sustaining human welfare and assuring future agricultural productivity and environmental stability. An understanding of global and local ecology depends on an awareness of the soil and its properties. Global information and mapping systems are essential tools for characterizing the landscape and its constituent soils.

Agronomists are crop and soil scientists who work to improve crops and agricultural productivity while effectively managing pests and weeds. Students in crop and soil science explore important contemporary issues faced by our society, including water quality and management, sustainability of different types of crop production, organic crop production, erosion and sedimentation, growing crops for biofuel production, land use and reclamation, genetic modification of crop plants, and soil quality and sustainability. An array of careers is available.

### Career Opportunities

Careers for crop scientists are available in business, industry, farming, research, agricultural chemical industries, seed production, seed technology, communications, conservation, and education. Positions are available in agricultural experiment stations and extension services, state departments of agriculture, food processing companies, insurance agencies, lending institutions, and commercial firms, both domestic and international, dealing in the processing and sale of farm products, chemicals, and seed.

Careers for soil scientists are available in agriculture, forestry, education, state and federal resource agencies, private consulting, and research. Farms, ranches, and agricultural supply companies employ soil scientists as managers or field representatives. Soil scientists may become teachers of vocational agriculture or environmental education, or they may become county extension agents in agriculture or natural resources. The U.S. Department of Agriculture's Forest Service and Natural Resources Conservation Service often employ soil scientists, as
do private consulting firms in environmental engineering and land use planning.

**Academic Advising**

Undergraduate curricula in crop and soil science are flexible enough to provide for the student’s individual professional needs and interests and for a broad-based general education by allowing electives in other colleges throughout the university. Undergraduate advising is a vital part of the program, and the department is well known for excellence in advising. The department has a head advisor who meets with all students each term. Advisors and faculty provide curricular guidance and aid in professional extracurricular activities, career decisions, and job placement.

**Scholarships**

The Department of Crop and Soil Science administers a number of scholarships available only to students majoring in the department. Over $40,000 is given to students each year.

**Student Clubs**

The department supports a Crop Science Club that provides valuable co-curricular professional development, a collegiate Soil Judging Team that participates in both regional and national competitions, the OSU Organic Growers Club that provides hands-on experience in organic production of vegetable crops, and the OSU Bug Club, a student club whose members are actively engaged in insect education outreach to local schools and communities. Graduate students in soil science also have a student club.

**Undergraduate Programs**

**Major**

- Crop and Soil Science (p. 121)
  - Options:
    - Agronomy
    - Plant Breeding and Genetics
    - Soil Science

**Minors**

- Crop Science (p. 127)
- Soil Science (p. 128)

**Graduate Programs**

**Majors**

- Crop Science (p. 126)
  - Options:
    - Entomology
    - Plant Breeding and Genetics
    - Soil Science (p. 128)

**Minors**

- Crop Science (p. 127)
- Soil Science (p. 128)

**Faculty**

**Professors** Bottomley, Butler (emeritus), Corp, Dragila, Hannaway, Hayes, Karow (emeritus), Kling (sr. research), Lajtha, Machado, Macnab, Mallory-Smith, Myrod, Noller, Rao, Reitz, Ross, Shock, Stephenson, Tuck, Young (emeritus), Zemetra

**Associate Professors** Angima, Baham (emeritus), Bohle, Chastain, Elias (sr. research), Felix, Flowers, Hulting, Kleber, Lutcher, Nonogaki, Parke (sr. research), Rondon, Roseberg, Schrumpf (seed certification, emeritus), D. Sullivan, Walenta, Wysocki

**Assistant Professors** N. Anderson, Dresv (sr. research), Leonard (sr. research), Pett-Ridge, C. Sullivan, Townsend (sr. research)

**Instructors** Cassidy, Charlton, Fery, McMorran (seed certification)

**Senior Instructors** Buhig, Burr (seed certification), A. Hunt, Japhet, Maley, Shafa (seed certification), S. Smith (seed certification), Zielinski (seed certification)

**Courtesy Faculty**

**Professors** Brilman, Brown, Griffith, Olszyk, Peterson

**Associate Professors** Henning, Mueller-Warrant, Riera-Lizaraz, Vales

**Assistant Professors** M. Johnson, M. Rogers, Weisbrod

**Professional Faculty**

Curry, Garay, Lewis, Lundeen

**Crop Science**

CROP 101. INTRODUCTION TO CROP, SOIL, AND INSECT SCIENCE. (1 Credit)

Introduces students with interests in crop, soil, and insect sciences to educational and professional opportunities in these disciplines. Speakers will discuss opportunities in research and academia as well as in the applied professional job market. CROSSLISTED as CROP 101/ENT 101/SOIL 101.

**Equivalent to:** ENT 101, HORT 101, SOIL 101

CROP 199. SPECIAL STUDIES: ISSUES IN SUSTAINABLE AGRICULTURE. (1–16 Credits)

Invited speakers present seminars on specific aspects of agriculture relating to sustainability. Topics vary from term to term and year to year. May be repeated for credit when topics differ.

**Equivalent to:** CROP 199H

This course is repeatable for 16 credits.

CROP 200. CROP ECOLOGY AND MORPHOLOGY. (3 Credits)

An introduction to the concepts and principles of crop ecology and morphology and a foundation for other crop science courses. Examines the dynamics and function of crop communities, and the biotic and environmental interactions that influence productivity. Fundamentals of the developmental morphology of crop seeds, seedlings, and plants. Morphological features of seeds and plants in relation to the identification of crop families and species of economic importance.

**Equivalent to:** CSS 200
CROP 280. INTRODUCTION TO THE COMPLEXITY OF OREGON CROPPING SYSTEMS. (4 Credits)
An introduction to field cropping systems of western Oregon. Provides students with a broad overview of the complexity of cropping systems and the knowledge required to grow and produce a crop–plant physiology, seed biology, plant pathology, soil fertility, entomology, and weed science. Students will observe a crop under different management strategies to enhance understanding of management approaches.

CROP 300. CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS. (4 Credits)
Relation of crop production to human culture and the natural environment. Origins of agriculture and the processes of agricultural change, and productivity and sustainability of specific crop production systems in the Pacific Northwest. History, geography, resource requirements, and key challenges faced are presented. Fundamental crop production practices in relation to productivity and sustainability. Lec/lab/rec. CROSSLISTED as CROP 300/HORT 300.
Equivalent to: CSS 300, HORT 300
Recommended: One year of general biology
CROP 310. FORAGE PRODUCTION. (4 Credits)
Importance of, and current production practices for, forage crops. Lec/lab.
Equivalent to: CSS 310
Recommended: (CSS 300 or CROP 300 or HORT 300) and (CSS 305 or CSS 205 or SOIL 205)
CROP 319. PRINCIPLES OF FIELD CROP PRODUCTION. (3 Credits)
Provides students with an understanding of the basic principles of field crop production—tillage, soil testing, fertilization, variety selection, planting, and in-season crop management. Management practices for wheat, corn and soybean are.
Recommended: CSS 200 or CROP 200
CROP 330. *WORLD FOOD CROPS. (3 Credits)
Origin, production, utilization, and improvement of the world’s major food crops. The role of crop production in global economic and social development; food security and worldwide nutritional requirements. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: CSS 330
Recommended: CSS 200 or CROP 200
CROP 340. *PENS AND PLOWS: WRITINGS OF WORKING THE LAND. (3 Credits)
A survey of literature from ancient Greece to the twentieth century focusing on the significance of agricultural life and/or the natural world. Students read and discuss writings considered critical in the development of Western culture and receive input on the literary significance and the accuracy of agriculture presented within the readings. (Bacc Core Course) Taught via Ecampus only.
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: CSS 340
CROP 355. ORGANIC CERTIFICATION. (3 Credits)
Learn about the USDA National Organic Program (NOP) standards relating to certified operations, inspection, certification processes, and labeling. Focus on the crops, processing, and livestock aspects of organic certification for farms and food manufacturing operations.
CROP 401. RESEARCH. (1-16 Credits)
Equivalent to: CSS 401
This course is repeatable for 16 credits.
CROP 403. THESIS. (1-16 Credits)
Independent, original study and preparation of a senior thesis.
Equivalent to: CSS 403
This course is repeatable for 16 credits.
CROP 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CROP 405H, CSS 405
This course is repeatable for 16 credits.
CROP 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CROP 405, CSS 405H
This course is repeatable for 16 credits.
CROP 407. SEMINAR. (1 Credit)
Senior seminar intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and to submit written documentation supporting that seminar.
Equivalent to: CSS 407
CROP 410. INTERNSHIP. (1-6 Credits)
Professional work experience previously approved and supervised by the department, written report required.
Equivalent to: CSS 410
This course is repeatable for 12 credits.
CROP 414. PRECISION AGRICULTURE. (4 Credits)
Provides insight into the technology available to support precision agriculture and data management planning applications. Examines the concepts and applications of precision agriculture to teach practical use of hardware, equipment and software. An overview of current technology including autonomous vehicles, GPS, soil and crop proximal sensors, imagery and mapping, variable rate control systems, and yield monitors.
Lec/lab. CROSSLISTED as CROP 414/HORT 414.
Equivalent to: HORT 414
CROP 418. TOXIC PLANTS IN PNW PASTURES. (1 Credit)
Identifying and understanding ecology and biology of harmful weeds and poisonous plants found in Pacific Northwest pastures and rangelands and determining best management and control options. Taught via Ecampus only.
Equivalent to: CSS 418
Recommended: College-level plant biology and/or taxonomy courses.
CROP 420. SEED SCIENCE AND TECHNOLOGY. (3 Credits)
Seed formation and factors affecting their development and maturation. Seed structure and chemical composition. Physiological and biochemical aspects of seed germination, dormancy, deterioration and storability. The concept of seed quality, its importance in agriculture, its attributes and impact on field performance. Methods of measuring seed quality of conventional and genetically modified seeds. Taught via Ecampus only.
Equivalent to: CSS 420
Recommended: Biology, plant anatomy and/or physiology courses
CROP 433. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered every year.
CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Prerequisites: BI 102 with D- or better or BI 213 with D- or better or BI 311 with D- or better or HORT 430 with D- or better or CSS 430 with D- or better or PBG 430 with D- or better or HORT 450 with D- or better or CSS 450 with D- or better or PBG 450 with D- or better
Equivalent to: CSS 433, HORT 433
CROP 440. WEED MANAGEMENT. (4 Credits)
Principles of weed control by cultural, biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use. Lec/lab/rec.
Equivalent to: CSS 440
Recommended: One year biological science and one course in organic chemistry.

CROP 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 448, RNG 448

CROP 460. SEED PRODUCTION. (3 Credits)
Equivalent to: CSS 460
Recommended: CROP 200 or CSS 200

CROP 463. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: HORT 463

CROP 470. OILSEEDS AND ESSENTIAL OIL CROPS. (3 Credits)
Provides students with an understanding of the principles and the latest research information of field crop production, chemistry, oil extraction and utilization of OEC. Includes the importance of OEC, their uses, current trends, production systems for major crops, harvesting, drying, processing, and other post-harvest operations, fixed (fatty acid) and essential oil extraction methods, and oil utilization. Relevant recent research and review papers will be also included and the information discussed and assessed. Prerequisites: CROP 200 with D- or better

CROP 480. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: HORT 480
Recommended: CROP 300 or HORT 300

CROP 499. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (1-16 Credits)
Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ. Equivalent to: CROP 499H, CSS 499
This course is repeatable for 16 credits.

CROP 499H. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (1-16 Credits)
Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ. Attributes: HNRS – Honors Course Designator Equivalent to: CROP 499, CSS 499H
This course is repeatable for 16 credits.

CROP 501. RESEARCH. (1-16 Credits)
Equivalent to: CSS 501
This course is repeatable for 16 credits.

CROP 503. THESIS. (1-16 Credits)
Equivalent to: CSS 503
This course is repeatable for 99 credits.

CROP 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSS 505
This course is repeatable for 16 credits.

CROP 506. PROJECTS. (1-16 Credits)
Equivalent to: CSS 506
This course is repeatable for 16 credits.

CROP 507. SEMINAR. (1 Credit)
Graded P/N. Equivalent to: CSS 507
This course is repeatable for 99 credits.

CROP 509. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/PBG 509/SOIL 509.
Equivalent to: CSS 509, ENT 509, PBG 509, SOIL 509
This course is repeatable for 9 credits.

CROP 514. PRECISION AGRICULTURE. (4 Credits)
Provides insight into the technology available to support precision agriculture and data management planning applications. Examines the concepts and applications of precision agriculture to teach practical use of hardware, equipment and software. An overview of current technology including autonomous vehicles, GPS, soil and crop proximal sensors, imagery and mapping, variable rate control systems, and yield monitors. Lec/lab.

CROP 520. SEED SCIENCE AND TECHNOLOGY. (3 Credits)
Seed formation and factors affecting their development and maturation. Seed structure and chemical composition. Physiological and biochemical aspects of seed germination, dormancy, deterioration and storability. The concept of seed quality, its importance in agriculture, its attributes and impact on field performance. Methods of measuring seed quality of conventional and genetically modified seeds. Taught via Ecampus only. Equivalent to: CSS 520
Recommended: Biology, plant anatomy and/or physiology courses

CROP 530. ORGANIC SOIL AND CROP MANAGEMENT. (3 Credits)
Overview of organic soil and crop management, organic soil system management, soil microbiology under organic systems, cropping systems, organic cereal production systems, organic forage production system, organic horticultural systems management, organic field and horticulture cropping systems; recent research and case studies. CROSSLISTED as CROP 530/SOIL 530.
Equivalent to: SOIL 530
Recommended: SOIL 525, CROP 200, SOIL 205 or introductory biology. Completion or concurrent enrollment in AGRI 520
CROP 533. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years. CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Equivalent to: CSS 533, HORT 533
Recommended: BOT 102 or BI 213 or BI 311 or HORT 430 or CSS 430 or PBG 430 or HORT 450 or CSS 450 or PBG 450

CROP 540. WEED MANAGEMENT. (4 Credits)
Principles of weed control by cultural, biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use. Lec/lab. Offered even years.
Equivalent to: CSS 540
Recommended: One year biological science and one course in organic chemistry.

CROP 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 548, RNG 548

CROP 560. SEED PRODUCTION. (3 Credits)
Equivalent to: CSS 560
Recommended: CROP 200 or CSS 200

CROP 563. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: HORT 563

CROP 570. OILSEEDS AND ESSENTIAL OIL CROPS. (3 Credits)
Provides students with an understanding of the principles and the latest research information of field crop production, chemistry, oil extraction and utilization of OEC. Includes the importance of OEC, their uses, current trends, production systems for major crops, harvesting, drying, processing, and other post-harvest operations, fixed (fatty acid) and essential oil extraction methods, and oil utilization. Relevant recent research and review papers will be also included and the information discussed and assessed.
Prerequisites: CROP 200 with D- or better
Recommended: Horticulture, biology or chemistry course

CROP 580. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: HORT 580
Recommended: CROP 300 or HORT 300

CROP 590. EXPERIMENTAL DESIGN IN AGRICULTURE. (4 Credits)
Field layout, analysis, and interpretation of basic experimental designs used in agronomy and plant breeding and including field plot techniques such as optimum plot size and shape, factorial arrangement, replication, sub-sampling, randomization, and blocking. Recitation provides practical experience with SAS. Lec/rec.
Equivalent to: CSS 590
Recommended: ST 351

CROP 599. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (0-16 Credits)
Technical knowledge and skills development courses offered in a wide variety of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Equivalent to: CSS 599
This course is repeatable for 16 credits.

CROP 601. RESEARCH. (1-16 Credits)
Equivalent to: CSS 601
This course is repeatable for 16 credits.

CROP 603. THESIS. (1-16 Credits)
Equivalent to: CSS 603
This course is repeatable for 999 credits.

CROP 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSS 605
This course is repeatable for 16 credits.

CROP 606. PROJECTS. (1-16 Credits)
Equivalent to: CSS 606
This course is repeatable for 16 credits.

CROP 607. SEMINAR. (1 Credit)
Graded P/N.
Equivalent to: CSS 607
This course is repeatable for 99 credits.

CROP 608. WORKSHOP. (1-16 Credits)
Equivalent to: CSS 608
This course is repeatable for 16 credits.

CROP 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: ENT 609, PBG 609, SOIL 609
This course is repeatable for 9 credits.

CROP 660. HERBICIDE SCIENCE. (4 Credits)
Absorption, movement, and mechanism of action in plants; behavior of herbicides in soil. Offered alternate years.
Recommended: BOT 331 and (CSS 440 or CSS 540 or CROP 440 or CROP 540)
CROP 670. PHYSIOLOGY OF CROP YIELD. (3 Credits)
Concepts of crop growth and production in relation to environmental and physiological factors and their interactions; current literature.
Equivalent to: CSS 670
Recommended: BOT 331

CROP 699. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE.
(1-16 Credits)
Equivalent to: CSS 699
This course is repeatable for 16 credits.

Crop and Soil Science

CSS 205. *SOIL SCIENCE. (4 Credits)
Introduction to the chemical, physical and biological nature of soils. Examines the functions of soil as a medium for plant growth, a recycling system for nutrients and wastes, a modifier of atmospheric chemistry, a habitat for soil organisms, a system for water purification, and an engineering medium. Field and laboratory projects provide an understanding of fundamental soil science principles and the impact of human activities on soil quality and sustainability. Lec/lab. (Bacc Core Course) Taught via Ecampus only.
Attributes: CPBS – Core, Pers, Biological Science; CPPS – Core, Pers, Physical Science
Equivalent to: CSS 305, SOIL 205

CSS 305. PRINCIPLES OF SOIL SCIENCE. (4 Credits)
Origin, formation, classification, physical, chemical, and biological characteristics; ecosystem functions of soils; effects of soil management on agricultural and forest crop production. Field trips. Taught at EOU LaGrande campus only.
Equivalent to: CSS 205, SOIL 205
Recommended: Two quarters of college chemistry and CSS 306

CSS 306. PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS. (1 Credit)
Problem solving for, and in-depth exploration of, Principles of Soil Science (CSS 305). Real-world problems requiring knowledge of soil physical, chemical, and biological properties. Taught at EOU LaGrande campus only.
Corequisites: CSS 305

CSS 315. *NUTRIENT MANAGEMENT AND CYCLING. (4 Credits)
Nutrient forms, transformations, and plant availability as influenced by chemical and biological reactions in soils; soil pH and management of acid and alkaline soils; characteristics and use of fertilizers, soil amendments and organic wastes. Labs include routine soil testing procedures, computer applications for soil fertility management, and field trips. Lec/lab. (Writing Intensive Course) Taught at EOU LaGrande campus only.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CSS 305 with D- or better
Recommended: CH 122 and courses in computers

CSS 320. PRINCIPLES OF OIL AND FIBER CROP PRODUCTION. (1 Credit)
An overview of production practices and characteristics of oil seed, essential oil, and fiber crops. Taught at EOU LaGrande campus only.
Recommended: CSS 300 and CSS 305

CSS 321. PRINCIPLES OF CEREAL CROP PRODUCTION. (1 Credit)
An overview of the principles underlying small grain production practices in the Pacific Northwest. Taught at EOU LaGrande campus only.
Recommended: CSS 300 and CSS 305

CSS 322. PRINCIPLES OF POTATO PRODUCTION. (1 Credit)
Principles and practices governing all aspects of potato production, storage and use. Taught at EOU LaGrande campus only.
Recommended: CSS 300 and CSS 305

Plant Breeding and Genetics

PBG 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: PBG 199H
This course is repeatable for 16 credits.

PBG 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 199
This course is repeatable for 16 credits.

PBG 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: PBG 299H
This course is repeatable for 16 credits.

PBG 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 299
This course is repeatable for 16 credits.

PBG 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 403. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

PBG 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: PBG 405H
This course is repeatable for 16 credits.

PBG 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 405
This course is repeatable for 16 credits.

PBG 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 409. TEACHING PRACTICUM. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PBG 410. INTERNSHIP. (1-12 Credits)
Offered via Ecampus only.
This course is repeatable for 12 credits.

PBG 430. PLANT GENETICS. (3 Credits)
Introduction to the principles of plant genetics with an emphasis on the structure and function of economically important plant genomes.
Equivalent to: HORT 430
Recommended: One year of biology and chemistry.

PBG 431. PLANT GENETICS RECITATION. (1 Credit)
Review and demonstration of plant genetics principles.
Equivalent to: CSS 431, HORT 431
PBG 441. PLANT TISSUE CULTURE. (4 Credits)
Principles, methods, and applications of plant tissue culture. Laboratory is important part of course. Topics include callus culture, regeneration, somaclonal variation, micropropagation, anther culture, somatic hybridization, and transformation. CROSSLISTED as PBG 441 and MCB 541/PBG 541.
Equivalent to: HORT 441
Recommended: (BI 311 and BOT 331) or PBG 430 or CSS 430

PBG 450. PLANT BREEDING. (4 Credits)
An introduction to the genetic improvement of self-pollinated, cross-pollinated, and asexually propagated species and the genetic principles on which breeding methods are based. Examples are drawn from a wide range of crops, including cereal grains, grasses, fruits, nuts, and vegetables; guest lecturers discuss their breeding programs. Additional topics include crop evaluation, germplasm preservation, disease resistance, and biotechnology. Lec/lab.
Prerequisites: PBG 430 with D- or better
Equivalent to: CSS 450, HORT 450
Recommended: BI 311 or PBG 430

PBG 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 499
This course is repeatable for 16 credits.

PBG 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PBG 503. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

PBG 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PBG 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 509. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/PCG 509/SOIL 509.
Equivalent to: CROP 509, ENT 509, SOIL 509
This course is repeatable for 9 credits.

PBG 510. INTERNSHIP. (4 Credits)
Offered via Ecampus only.
This course is repeatable for 12 credits.

PBG 513. PLANT GENETIC ENGINEERING. (3 Credits)
Principles, methods, and recent developments in the genetic engineering of higher plants. Offered alternate years.
Equivalent to: HORT 513
Recommended: (BI 311 and BOT 331) or (CSS 430 or CSS 530) or (HORT 430 or HORT 530) or (PBG 430 or PBG 530)

PBG 519. CURRENT TOPICS IN PLANT BREEDING AND GENETICS. (2 Credits)
Provides an advanced understanding of plant breeding and genetics and their relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as HORT 519/PBG 519.
Equivalent to: HORT 519
This course is repeatable for 12 credits.

PBG 530. PLANT GENETICS. (3 Credits)
Introduction to the principles of plant genetics with an emphasis on the structure and function of economically important plant genomes.
Equivalent to: HORT 530
Recommended: One year of biology and chemistry.

PBG 541. PLANT TISSUE CULTURE. (4 Credits)
Principles, methods, and applications of plant tissue culture. Laboratory is important part of course. Topics include callus culture, regeneration, somaclonal variation, micropropagation, anther culture, somatic hybridization, and transformation. CROSSLISTED as PBG 441 and MCB 541/PBG 541.
Equivalent to: HORT 441, MCB 541
Recommended: (BI 311 and BOT 331) or PBG 430

PBG 550. PLANT BREEDING. (4 Credits)
An introduction to the genetic improvement of self-pollinated, cross-pollinated, and asexually propagated species and the genetic principles on which breeding methods are based. Examples are drawn from a wide range of crops, including cereal grains, grasses, fruits, nuts, and vegetables; guest lecturers discuss their breeding programs. Additional topics include crop evaluation, germplasm preservation, disease resistance, and biotechnology. Lec/lab.
Prerequisites: PBG 450 with C or better or PBG 550 with C or better
Equivalent to: CSS 550, HORT 550
Recommended: BI 311 or PBG 430 or PBG 530

PBG 551. BREEDING CLONAL CROPS. (1 Credit)
The overall goal of the course is to gain fundamental knowledge of breeding methods for clonal crops; these methods are different from those used for seed-propagated crops. Specific examples from a wide array of plant species (tree fruits, berries, tree nuts, potato, sweet potato, cassava, cacao) will be provided to illustrate application of the fundamental knowledge.
Prerequisites: PBG 450 with C or better or PBG 550 with C or better

PBG 552. PLANT BREEDING AND SEED PRODUCTION IN ORGANIC SYSTEMS. (3 Credits)
Genetic improvement and seed propagation of self-pollinated and cross-pollinated crops bred for and used in organic production. The philosophical basis for organic agriculture will be reviewed in the context of what breeding technologies are allowed and why. Important traits for adaptation to organic production will be described. Models for organic plant breeding and examples of such programs are provided.
Prerequisites: PBG 530 with D or better
Recommended: BI 311 or PBG 430

PBG 556. CROP PLANT DOMESTICATION. (2 Credits)
Learning is based on discussion of the contemporary literature on crop plant origins and domestication. The major agronomic and horticultural crops will be covered. Topics include primary centers of domestication, traits altered by domestication, effect of genetic architecture and local ecology on domestication, and importance of genetic diversity to current plant improvement efforts.
PBG 557. PLANTS AND PATENTS. (2 Credits)
Learn about different methods of intellectual property protection in agriculture with a focus on plant patents, plant variety protection and utility patents. The rights, current issues and restrictions that different types of patents allow will be presented through reading the current literature.

PBG 591. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PBG 603. DISSERTATION. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

PBG 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratories, recitation, and lectures. Graded P/N.

PBG 620. DNA FINGERPRINTING. (1 Credit)
Principles and methods for producing and analyzing DNA fingerprints. Offered alternate years. CROSSLISTED as MCB 620/PBG 620.
Equivalent to: CSS 620, MCB 620
Recommended: BI 311 or CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530

PBG 621. GENETIC MAPPING. (1 Credit)
Principles and methods for constructing genetic maps comprised of molecular and other genetic markers. Offered alternate years. CROSSLISTED as MCB 621/PBG 621.
Equivalent to: CSS 621, MCB 621
Recommended: BI 311 or CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530

PBG 622. MAPPING QUANTITATIVE TRAIT LOCI. (1 Credit)
Principles and methods for mapping genes underlying phenotypically complex traits. Offered alternate years. CROSSLISTED as MCB 622/PBG 622.
Equivalent to: CSS 622, MCB 622
Recommended: CROP 590 or CSS 590 or ST 513

PBG 550. ADVANCED PLANT BREEDING AND QUANTITATIVE GENETICS. (3 Credits)
Pedigree, bulk, single-seed-descent, doubled haploid, backcross, testcross, mass, and half-sib, S~1~, and S~2~ family breeding methods; breeding hybrids and selecting sources of alleles for developing superior hybrids; the nature and consequences of genotype by environment interactions; marker-assisted backcross and inbred line breeding; quantitative trait locus mapping; random linear models; designing and analyzing cultivar, line, and family selection experiments. Offered odd years.
Equivalent to: CSS 650
Recommended: (CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530) and (CSS 450 or CSS 550 or PBG 450 or PBG 550 or HORT 450 or HORT 550) and (ST 411 or ST 511) and (ST 412 or ST 512) and (ST 413 or ST 513)

PBG 691. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

**Soil Science**

SOIL 101. INTRODUCTION TO CROP, SOIL, AND INSECT SCIENCE. (1 Credit)
Introduces students with interests in crop, soil, and insect sciences to educational and professional opportunities in these disciplines. Speakers will discuss opportunities in research and academia as well as in the applied professional job market. CROSSLISTED as CROP 101/ENT 101/SOIL 101.
Equivalent to: CROP 101, ENT 101, HORT 101

SOIL 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: SOIL 199H
This course is repeatable for 16 credits.

SOIL 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 199
This course is repeatable for 16 credits.

SOIL 205. SOIL SCIENCE. (3 Credits)
Introduction to the chemical, physical and biological nature of soils. Examines how soils function in terms of plant growth, nutrient supply, the global carbon cycle, ecological habitat, and water purification. Community-based learning projects provide hands-on experience with fundamental soil science principles and the impact of human activities on soil quality and sustainability. Lec. (Bacc Core Course if taken with SOIL 206 or FOR 206)
Attributes: CPBL – Core, Pers, BioSci Attached Lec; CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: SOIL 206 (may be taken concurrently) with D- or better or FOR 206 (may be taken concurrently) with D- or better
Equivalent to: CSS 205, CSS 305

SOIL 206. *SOIL SCIENCE LABORATORY FOR SOIL 205. (1 Credit)
Students will gain hands-on experience with soil science concepts and applications. Laboratory exercises and field trips will help students develop proficiency in the methods/tools for analyzing soil chemistry, biology, morphology, physical properties, and soil forming factors. Skills will be taught in the context of soils’ social, economic, and environmental importance. (Bacc Core Course if taken with SOIL 205)
Attributes: CPBS – Core, Pers, Biological Science; CPPS – Core, Pers, Physical Science
Corequisites: SOIL 205
SOIL 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: SOIL 299H
This course is repeatable for 16 credits.

SOIL 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 299
This course is repeatable for 16 credits.

SOIL 316. NUTRIENT CYCLING IN AGROECOSYSTEMS. (4 Credits)
Nutrient forms, transformations, and cycling. Diagnosis and correction of nutrient deficiencies, pH and salinity. Impact of nutrient management practices on crop production, soil health, nutrient use efficiency, and environmental quality. Organic and inorganic fertilization. Labs include soil sampling and testing procedures, data collection on soil and plants, computer applications for soil fertility management, and field trips. Lec/lab.
Prerequisites: (CH 121 with D- or better or CH 231 with D- or better) and (SOIL 205 [C] or CSS 205 [C] or CSS 305 [C])
Equivalent to: CSS 316

SOIL 360. SOIL MANAGEMENT FOR ORGANIC PRODUCTION. (3 Credits)
This is a skills-based soil management course that is part lecture and part student-centered learning. Significant class time will be devoted to making field-scale management decisions. The course includes individual and group work, presentation, and discussion. The intent is to prepare students for real-world application of soil management decisions in certified organic systems. Using the National Organic Program as a starting point as well as farm system descriptions with extensive long-term data sets, we will interpret soil nutrient analyses, cover cropping systems, and organic amendments, to design soil management plans for two model cropping systems (annual and perennial).
Prerequisites: (SOIL 205 with C or better and (SOIL 206 [C] or FOR 206 [C])) or CSS 205 [C]
Recommended: Introductory soil science course with lab

SOIL 366. ECOSYSTEMS OF WILDLAND SOILS. (3 Credits)
Focuses on soils that occur in relatively undisturbed ecosystems such as forests and rangelands. Topics covered include properties and processes specific to understanding and managing the soil resource in these areas. An overview of US Soil Taxonomy will also be given.
Prerequisites: SOIL 205 with D- or better or CSS 205 with D- or better or CSS 305 with D- or better
Recommended: An understanding and appreciation of environmental chemistry, biology, ecology, and physics

SOIL 388. SOIL SYSTEMS AND PLANT GROWTH. (4 Credits)
Introduces soils as providers of critical resources for plant growth. Explains how soils supply water, air, thermal energy and nutrients to plants. Shows that sustainable management of soil resources requires substantial understanding of their role in the functioning of natural, forest, and agricultural systems. Explains controls on stocks and availabilities of individual soil resources and mechanisms making these resources plant-available.
Prerequisites: ((SOIL 205 with D- or better and (SOIL 206 [D-] or FOR 206 [D-])) or CSS 205 [D-]) and (CH 121 [D-] or CH 231 [D-]) and (BOT 220 [D-] or (BI 204 [D-] or BI 205 [D-] or BI 206 [D-]) or (BI 211 [D-] or BI 212 [D-] or BI 213 [D-])

SOIL 395. **WORLD SOIL RESOURCES. (3 Credits)
The properties, global distribution, and agricultural productivity of major world soil groups are described. Potentials for human-accelerated soil degradation are introduced for each soil group, and reasons for conflicting assessments of degradation are discussed. Offered via ECampus only. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC
Prerequisites: CH 121 with D- or better or CH 122 with D- or better or CH 123 with D- or better or CH 201 with D- or better or CH 202 with D- or better or CH 231 with D- or better or CH 231H with D- or better or CH 232 with D- or better or CH 232H with D- or better or CH 233 with D- or better or CH 233H with D- or better
Equivalent to: CSS 395
Recommended: One term of chemistry

SOIL 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 401. RESEARCH. (1-16 Credits)
Equivalent to: CSS 401
This course is repeatable for 16 credits.

SOIL 403. THESIS. (1-16 Credits)
Independent, original study and preparation of a senior thesis.
Equivalent to: CSS 403
This course is repeatable for 16 credits.

SOIL 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: SOIL 405H
This course is repeatable for 16 credits.

SOIL 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 405
This course is repeatable for 16 credits.

SOIL 407. SEMINAR. (1-16 Credits)
Evaluation and judging of soils in Oregon and other states; directed studies of soil morphology, soil survey, soil fertility, soil physics, soil chemistry, soil biology, and soil information systems.
Equivalent to: CSS 408
This course is repeatable for 16 credits.

SOIL 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 410. INTERNSHIP. (1-6 Credits)
Professional work experience previously approved and supervised by the department, written report required.
Equivalent to: CSS 410
This course is repeatable for 12 credits.

SOIL 435. ENVIRONMENTAL SOIL PHYSICS. (3 Credits)
Covers principles of soil physical properties and processes as they relate to agricultural, hydrological and environmental problems. Lec/lab. Offered odd years.
Prerequisites: CSS 205 with D- or better or CSS 305 with D- or better or SOIL 205 with D- or better
Equivalent to: CSS 435
Recommended: CH 123 and MTH 241 and PH 201
SOIL 445. ENVIRONMENTAL SOIL CHEMISTRY. (3 Credits)
Structural chemistry of clay minerals and organic matter, cation and anion exchange, and soil solution equilibria of soils. Ion exchange, mineral-solution equilibria, and adsorption reactions of silicate clays, oxides, and organic matter are emphasized. Covers the sorption behavior of environmental contaminants and the weathering reactions that govern the transport of reactive solutes through soils. Lec/rec. Offered odd years.
Equivalent to: CSS 445

SOIL 455. BIOLOGY OF SOIL ECOSYSTEMS. (4 Credits)
A detailed study of the organisms that live in the soil and their activities in the soil ecosystems, soil as a habitat for organisms, taxonomy and biology of soil organisms, fundamentals of nutrient cycles, special topics in soil biology, review basis of soil microbial and ecological principles. Lec/rec/lab.
Equivalent to: CSS 455
Recommended: (CSS 305 or CSS 205 or SOIL 205). Courses in chemistry, physics, and microbiology

SOIL 466. SOIL MORPHOLOGY AND CLASSIFICATION. (4 Credits)
Observation and description of soil properties in the field; writing soil profile descriptions; evaluating criteria that define features used to classify soils; using soil classification keys. Lec/lab. Offered even years.
Prerequisites: SOIL 205 with D- or better or CSS 466 (may be taken concurrently) with D- or better or CSS 305 with D- or better
Equivalent to: CSS 466

SOIL 468. SOIL LANDSCAPE ANALYSIS. (4 Credits)
Principles of soil geomorphology, soil stratigraphy, and surficial processes as applied to understanding the soil system and landscape scales. Emphasis on field observations of soils, geomorphic surfaces, and environment. Field project entails design of soil survey map units, field mapping and GIS cartographic techniques. Lec/lab. Offered even years.
Prerequisites: SOIL 466 (may be taken concurrently) with D- or better or CSS 466 (may be taken concurrently) with D- or better
Equivalent to: CSS 468

SOIL 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: SOIL 499H
This course is repeatable for 16 credits.

SOIL 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 499
This course is repeatable for 16 credits.

SOIL 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 503. THESIS/DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

SOIL 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 508. WORKSHOP. (1-16 Credits)
Evaluation and judging of soils in Oregon and other states; directed studies of soil morphology, soil survey, soil fertility, soil physics, soil chemistry, soil biology, and soil information systems.
Equivalent to: CSS 508
This course is repeatable for 16 credits.

SOIL 509. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/PBG 509/SOIL 509.
Equivalent to: CROP 509, ENT 509, PBG 509
This course is repeatable for 9 credits.

SOIL 510. INTERNSHIP. (1-6 Credits)
Professional work experience previously approved and supervised by the department, written report required.
This course is repeatable for 6 credits.

SOIL 511. SOIL: A NATURAL AND SOCIETAL RESOURCE. (3 Credits)
Serves degree- and non-degree-seeking graduate learners wanting soil science knowledge but having minimal science background. Understanding soil physical, chemical, and biological properties promotes informed soil management while supporting individual to global societal values. Established curriculum facilitates graduate degrees or certificates, continuing education, professional certification, and self-improvement goals. A highly interactive social media framework supports weekly student-student and instructor-student learning interactions.

SOIL 512. METHODS OF SOIL ANALYSIS - FIELD. (1 Credit)
Recognition and quantitative description of soil properties in agroecosystems. Assessments of soil environments used for crop production in Oregon. Demonstration and practice of volumetric and bulk soil sampling techniques as well as the application of pedotransfer functions. Each participant will be responsible for analyzing at least one soil sample in the chemical level. Five-day duration with four overnight stays at campgrounds. Participants will use their own or borrowed camping equipment.
Recommended: SOIL 205 with a minimum grade of C

SOIL 514. METHODS OF SOIL ANALYSIS - LABORATORY. (2 Credits)
Provide the theoretical background, as well as practical experience needed to plan, select, execute, and interpret soil chemical and physical analyses such as those typically used for nutrient management recommendations. Individual and group activities involve classroom presentations, as well as hands-on work in a teaching laboratory. Samples processed are those collected in SOIL 512, Methods of Soil Analysis - Field. Duration is five full work days.
Prerequisites: SOIL 512 (may be taken concurrently) with C or better
Recommended: SOIL 205 and successful completion of EH&S Laboratory

SOIL 515. SOIL FERTILITY MANAGEMENT. (3 Credits)
Management of plant nutrients in agronomic systems; diagnosis of nutrient availability and prediction of crop response to fertilizers; interactions between nutrient response and chemical, physical and biological properties of soils.
Equivalent to: CSS 515
Recommended: CSS 315 and courses in statistics, chemistry and plant physiology.

SOIL 523. PRINCIPLES OF STABLE ISOTOPES. (3 Credits)
An introduction to the theory and use of stable isotopes. Applications of stable isotopes to soil science, plant physiology, hydrology, and ecosystem studies. Offered even years.
Equivalent to: CSS 523
SOIL 525. MINERAL-ORGANIC MATTER INTERACTIONS. (3 Credits)
Studies the fundamental properties of the mineral-organic interface and the mechanisms of interaction between mineral and organic soil properties.
Equivalent to: CSS 525
Recommended: CSS 305 or CSS 205 or SOIL 205

SOIL 530. ORGANIC SOIL AND CROP MANAGEMENT. (3 Credits)
Overview of organic soil and crop management, organic soil system management, soil microbiology under organic systems, cropping systems, organic cereal production systems, organic forage production systems, organic horticultural systems management, organic field and horticulture cropping systems; recent research and case studies. CROSSLISTED as CROP 530/SOIL 530.
Equivalent to: CROP 530
Recommended: (SOIL 525, CROP 200 and SOIL 205 or introductory biology) and completion or concurrent enrollment in AGRI 520

SOIL 535. SOIL PHYSICS. (3 Credits)
Theoretical elements of soil physical properties and processes related to agricultural, hydrological and environmental problems. Offered fall term in even years.
Equivalent to: CSS 535
Recommended: CSS 305, CSS 205, SOIL 205, MTH 241, CH 123, PH 201

SOIL 536. VADOSE ZONE HYDROLOGY LABORATORY. (1 Credit)
Experimental elements of soil physical properties and processes allowing practical experience in the measurement and analysis of soil physical processes related to agricultural, hydrological and environmental problems. Weekly laboratory. Offered even years.
Equivalent to: CSS 536
Recommended: CH 123 and PH 201

SOIL 545. ENVIRONMENTAL SOIL CHEMISTRY. (3 Credits)
Structural chemistry of clay minerals and organic matter, cation and anion exchange, and soil solution equilibria of soils. Ion exchange, mineral-solution equilibria, and adsorption reactions of silicate clays, oxides, and organic matter are emphasized. Covers the sorption behavior of environmental contaminants and the weathering reactions that govern the transport of reactive solutes through soils. Lec/rec. Offered odd years.
Equivalent to: CSS 545

SOIL 547. NUTRIENT CYCLING. (3 Credits)
Reviews and discusses ecosystem-level biogeochemical concepts for terrestrial and freshwater ecosystems, primarily by reading and discussing classic and current literature to determine the state-of-knowledge and uncertainties associated with it. Topics include root nutrient uptake mechanisms, soil chemical and biochemical transformations in different soil and ecosystems, measuring soil solution and watershed fluxes, soil organic matter formation and structure, the meaning of sustainability, the concept of N saturation in terrestrial ecosystems, and the use of natural abundance and tracer isotopes in ecosystem biogeochemistry. While forest biogeochemical processes will be emphasized, desert, aquatic, wetland, and prairie ecosystems will also be explored. CROSSLISTED as BOT 547/SOIL 547.
Equivalent to: BOT 547, FS 547
Recommended: College-level chemistry and biology and one class in ecology (eg. BI 370) and/or soils (eg. SOIL 205)

SOIL 555. BIOLOGY OF SOIL ECOSYSTEMS. (4 Credits)
A detailed study of the organisms that live in the soil and their activities in the soil ecosystems, soil as a habitat for organisms, taxonomy and biology of soil organisms, fundamentals of nutrient cycles, special topics in soil biology, review basis of soil microbial and ecological principles. Lec/rec/lab.
Equivalent to: CSS 555
Recommended: CSS 305 or CSS 205 or SOIL 205. Courses in chemistry, physics, and microbiology

SOIL 566. SOIL MORPHOLOGY AND CLASSIFICATION. (4 Credits)
Observation and description of soil properties in the field; writing soil profile descriptions; evaluating criteria that define features used to classify soils; using soil classification keys. Lec/lab.
Equivalent to: CSS 566
Recommended: CSS 305 or CSS 205 or SOIL 205

SOIL 586. GENERAL SURVEY OF ORGANIC SOIL AND CROP MANAGEMENT. (4 Credits)
Principles of soil geomorphology, soil stratigraphy, and surficial processes as applied to understanding the soil system at landscape scales. Emphasis on field observations of soils, geomorphic surfaces, and environment. Field project entails design of soil survey map units, field mapping and GIS cartographic techniques. Lec/lab. Offered odd years.
Prerequisites: CSS 566 (may be taken concurrently) with C or better or SOIL 566 (may be taken concurrently) with C or better
Equivalent to: CSS 586

SOIL 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 603. THESIS/DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

SOIL 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: CROP 609, ENT 609, PBG 609
This course is repeatable for 9 credits.

SOIL 635. ADVANCED SOIL PHYSICS. (3 Credits)
Explores theoretical development of a key topic in soil physics. Topics may include evaporation from porous media, multiphase fluid movement, soil deformation, and soil salinization, with respect to either historical development, present day understanding or future needs of the field. Course structure incorporates lectures and discussion requiring intensive student participation. Offered odd years.
Prerequisites: CSS 535 with C or better or SOIL 535 with C or better
Recommended: A working knowledge of soil physics and a passing grade in a graduate-level soil physics course
SOIL 645. SOIL MICROBIAL ECOLOGY. (3 Credits)
An advanced treatment of current topics in soil microbiology, with an emphasis on the ecology of soil microorganisms. Topics include the size, composition, diversity, and activity of soil microbial communities, linkage of microbial community structure to ecosystem functions, and applications of molecular biology to soil microbiology. Offered even years.
Equivalent to: CSS 645
Recommended: SOIL 455 or CSS 455 or MB 448

SOIL 684. GLOBAL BIOGEOCHEMICAL CYCLES. (4 Credits)
An in-depth treatment of global biogeochemical cycles, focusing on cycles of carbon, oxygen, nitrogen, phosphorus, and sulfur in the atmosphere, hydrosphere, and lithosphere. CROSSLISTED as GEO 684/ SOIL 684.
Equivalent to: GEO 684
Recommended: One year of college-level physics and chemistry, including introductory biology. One year of graduate coursework in soil, earth, ocean, atmospheric or forest science

SOIL 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Sustainability

SUS 102. *INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY. (4 Credits)
An introduction to the science behind critical environmental issues and the biological basis of creating and maintaining sustainable ecosystems. Focus on such questions as: how do we determine what to believe about environmental issues? How do we quantify, restore, and value biodiversity? What is valid science in the global warming debate? Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: SOIL 102

SUS 103. *INTRODUCTION TO CLIMATE CHANGE. (4 Credits)
An introduction to the principles of climate change science with an emphasis on the empirical evidence for climate change. Students will learn critical thinking skills to assess such questions as: How do we determine the processes controlling global warming? How do we predict trends in climate change? How do we calculate and understand uncertainty in these predictions? What is valid science in the global warming debate? Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

SUS 304. *SUSTAINABILITY ASSESSMENT. (4 Credits)
Explores theories and application of sustainability assessment techniques and analysis methods. Practical application of globally recognized assessment protocol, including checklists, footprinting, life-cycle analysis and the indicators used to conduct these analyses. Emphasis on ecological and social indicators, although economic indicators are explored. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

SUS 325. *AG AND ENVIRONMENTAL PREDICAMENTS: A CASE STUDY APPROACH. (3 Credits)
Analyze controversial agricultural and environmental issues, synthesize information from diverse sources, and apply scientific knowledge to recommend specific courses of action to solve real world problems. Develop oral and written communication skills through individual and group work. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: SOIL 325

SUS 331. *SUSTAINABILITY, JUSTICE, AND ENGAGEMENT. (3 Credits)
Many sustainability crises are local, and the people most impacted tend to be groups already experiencing difference, lack of power, and discrimination. Transformational responses led by those most affected will be examined – responses that address the environmental problem while also building social and economic power for those affected. The tools and tactics used to achieve positive changes will be analyzed. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SUS 350. *SUSTAINABLE COMMUNITIES. (4 Credits)
Introduction to the concept of sustainable communities from a multidisciplinary perspective. Instructors from a broad array of disciplines and professions. Development of holistic thinking skills and innovative solutions to complex problems. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: NR 350

SUS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SUS 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

SUS 420. SOCIAL DIMENSIONS OF SUSTAINABILITY. (3 Credits)
Focuses on the social aspects of sustainability, including how the environment, the economy, social life interact to create the world we live in. Explores how social institutions (school, government, business, family) contribute to sustainability and promote or discourage social and environmental justice at local and global scales. Also offered at OSU-Cascades and via Ecampus.

SUS 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SUS 512. TOPICS IN THE SCIENCE OF SUSTAINABILITY. (4 Credits)
Provides a graduate-level introduction to key concepts and issues in environmental science and sustainability, targeted at business-oriented graduate and post-bacc students who do not have a science background. The course is a core requirement of the Sustainable Business certificate program offered jointly by the College of Business (COB) and the College of Agricultural Sciences’ (CAS) Sustainability Double-Degree (SDD) Program.

SUS 514. SUSTAINABILITY PLANNING AND ASSESSMENT. (4 Credits)
Sustainability is fundamentally about balancing social, economic and ecological systems. This course examines a range of different methodologies for measuring and evaluating performance towards established sustainability criteria and indicators. Students will critically evaluate tools for making sustainable decisions and understand the limitations of individual assessment approaches in different contexts. Specific assessment techniques to be explored include ecological footprinting, sustainable community indicators, greenhouse gas emissions inventories, sustainability checklists, environmental management systems (ISO standards), life-cycle analysis, and business sustainability reporting. Students will leave the course with the fundamental skills required to complete sustainability assessments via globally relevant approaches.

SUS 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
Crop and Soil Science Undergraduate Major (BS, HBS)

Also available at LaGrande.

Major Code: 120

The Bachelor of Science degree in Crop and Soil Science requires the choice of one of three options:

1. Agronomy
2. Plant Breeding and Genetics
3. Soil Science (also available via Ecampus)

Major Code: 120

Agronomy Option

This option is offered within the following major(s):

• Crop and Soil Science - College of Agricultural Sciences (p. 121)

Also available at LaGrande.

Students in the Agronomy option will gain the knowledge and skills necessary to be active participants in producing food, feed, fiber, and energy crops for our world. Increased production of field crops—wheat, corn, rice, sorghum, soybeans, forages, cotton, etc.—will be essential to meet the basic needs of the world’s ever-growing population and such production will need to be accomplished in a world of diminishing soil, water, mineral, and petrochemical resources. As an agronomic professional, you will have the knowledge and skill to access the potentials of a given production system and to choose plant materials and plant production practices that will optimize production while minimizing environmental impact. Maximum sustainable production will be your goal and you will need in-depth knowledge of plants, plant genetics, plant pests, soils, soil fertility, production equipment, economics, and politics to achieve this goal. Agronomists work for field crop production companies, as managers of small to large farms and ranches, and as managers of their own farming operations. Agronomists also work for federal, state, or local government agencies as educators, researchers, or field technicians. Others hold teaching, research, or extension positions in universities. Some work for private research laboratories, environmental service companies, insurance companies, or land appraisal firms.

Option Code: 784

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<th>Code</th>
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<tr>
<td>BI 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
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<td>CROP 280</td>
<td>INTRODUCTION TO THE COMPLEXITY OF OREGON CROPPING SYSTEMS</td>
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<td>CROP 319</td>
<td>PRINCIPLES OF FIELD CROP PRODUCTION</td>
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<tr>
<td>CROP 330</td>
<td>*WORLD FOOD CROPS</td>
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<tr>
<td>PBG 430</td>
<td>PLANT GENETICS</td>
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<td>PBG 431</td>
<td>PLANT GENETICS RECITATION</td>
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<tr>
<td>SOIL 316</td>
<td>NUTRIENT CYCLING IN AGROECOSYSTEMS</td>
<td>4</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
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</table>

Agronomy Electives

Select at least 7-8 credits of the following:

- BEE 439 IRRIGATION PRINCIPLES AND PRACTICES
- BOT 313 PLANT STRUCTURE
- CROP 310 FORAGE PRODUCTION
- CROP 420 SEED SCIENCE AND TECHNOLOGY (Ecampus only)
- CROP 460 SEED PRODUCTION
- HORT 316 PLANT NUTRITION

General Electives

Select at least 7-8 credits of the following:

- BB 350 ELEMENTARY BIOCHEMISTRY
- BOT 321 PLANT SYSTEMATICS
- BOT 414 AGROSTOLOGY
- BOT 442 PLANT POPULATION ECOLOGY
Option Code: 784

**Plant Breeding and Genetics Option**

This option is offered within the following major(s):

- Crop and Soil Science - College of Agricultural Sciences (p. 121)
- Horticulture - College of Agricultural Sciences (p. 176)

**Also available at LaGrande.**

The Plant Breeding and Genetics (PBG) option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is a collaborative discipline spanning everything from classical field approaches to gene manipulation at the molecular level. Breeders regularly cooperate with pathologists, entomologists, soil scientists, physiologists, food scientists, geneticists, molecular biologists and experts in other fields.

Students in the Plant Breeding and Genetics option will learn an interdisciplinary approach to applied plant breeding by taking courses across a broad spectrum of disciplines. The option may be tailored to meet students’ career goals including graduate school, as well as directly entering public or private sector breeding programs. After completing their degree, students will have gained fundamental knowledge in plant breeding that may be applied in a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products.

This option is under both the Crop and Soil Science major and the Horticulture major. The option uses the new horticulture major core.

**Option Code: 785**

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<thead>
<tr>
<th>Code</th>
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<td><strong>Plant Materials</strong></td>
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<td>Select one of the following:</td>
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<tr>
<td>BOT 313</td>
<td>PLANT STRUCTURE</td>
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<td>BOT 321</td>
<td>PLANT SYSTEMATICS</td>
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<td>BOT 425</td>
<td>FLORA OF THE PACIFIC NORTHWEST</td>
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<td>CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
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<tr>
<td>FES 241</td>
<td>DENDROLOGY</td>
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<tr>
<td>HORT 226</td>
<td>LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS</td>
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Select one of the following: 3-4

AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY
BI 301 *HUMAN IMPACTS ON ECOSYSTEMS
CROP 330 *WORLD FOOD CROPS
FES 365 *ISSUES IN NATURAL RESOURCES CONSERVATION
GW 325 *GLOBAL ISSUES IN RESOURCE ECOLOGY
GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 330 **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION
HORT 331/ENT 331 *POLLINATORS IN PERIL
SUS 350 *SUSTAINABLE COMMUNITIES
WSE 470 *FORESTS, WOOD, AND CIVILIZATION
Z 349 *BIOVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION

Science, Technology and Society
Select one of the following: 3-4

AGRI 411 *INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL
ANS 315 *CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE
BI 348 *HUMAN ECOLOGY
BOT 324 *FUNGI IN SOCIETY
CH 374 *TECHNOLOGY, ENERGY, AND RISK
ENGR 350 *SUSTAINABLE ENGINEERING
ENGR 363 *ENERGY MATTERS
ENSC 479 **ENVIRONMENTAL CASE STUDIES
FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
FES 477/NR 477 *AGROFORESTRY
FES 485 *CONSSENSUS AND NATURAL RESOURCES
FST 421 *FOOD LAW
FW 470 *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN
GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 340 *INTRODUCTION TO WATER SCIENCE AND POLICY
HEST 310 *INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN
HORT 330/ENT 330 *PLAGUES, PESTS, AND POLITICS
HST 481 *ENVIRONMENTAL HISTORY OF THE UNITED STATES
HSTS 421 *TECHNOLOGY AND CHANGE
NUTR 312 *ISSUES IN NUTRITION AND HEALTH
PH 313 *ENERGY ALTERNATIVES
PHL 325 *SCIENTIFIC REASONING
PS 476 *SCIENCE AND POLITICS
SOIL 395 **WORLD SOIL RESOURCES
SUS 304 *SUSTAINABILITY ASSESSMENT

Total credits required for graduation 180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Soil Science Option

This option is offered within the following major(s):

- Crop and Soil Science - College of Agricultural Sciences (p. 121)

Also available at LaGrande and via Ecampus.

The study of soil as a science provides students with a basic understanding of the physical, chemical, and biological properties of this essential natural resource. Soil is the fundamental substrate for life in terrestrial systems. Our food, fiber, and renewable energy are dependent on soils. Our understanding of soils is critical in the successful siting of buildings and construction of roadways and other transportation infrastructure. Our understanding of global and local ecology depends on an awareness of soil and its properties. Soils are the filters of our water and play active roles in storing carbon and other materials that are essential in human existence. As a soil science student, you will explore issues including water quality and management, organic crop production, erosion and sedimentation, land use and reclamation, and soil quality and sustainability. As a soil science professional you will be able to use your knowledge and skills to solve real-world, sustainable living problems in urban, agricultural, forest, rangeland, and other natural systems. Many soil scientists work for the Natural Resource Conservation Service. Some work for other federal, state, or local government agencies as extension educators, researchers, or surveyors. Others hold teaching or research positions in colleges and universities. Soil scientists also work for fertilizer companies, private research laboratories, environmental service companies, insurance companies, and land appraisal firms.

Option Code: 160

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<tr>
<td>BI 211</td>
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<td>HORT 316</td>
<td>PLANT NUTRITION</td>
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<td>HORT 318</td>
<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
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<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<td>PBG 430</td>
<td>PLANT GENETICS</td>
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<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
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<td>PBG 450</td>
<td>PLANT BREEDING</td>
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<td>BOT 350</td>
<td>INTRODUCTORY PLANT PATHOLOGY</td>
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<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
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<td>HORT 463</td>
<td>SEED BIOLOGY</td>
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<td>HORT 407</td>
<td>SEMINAR</td>
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<td>HORT 480</td>
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<td>CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT or HORTICULTURE PRODUCTION CASE STUDIES</td>
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<td>HORT 480</td>
<td>or HORT 481</td>
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<tr>
<td>HORT 407</td>
<td>SEMINAR</td>
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<tr>
<td>HORT 480</td>
<td>or HORT 481</td>
<td>CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT or HORTICULTURE PRODUCTION CASE STUDIES</td>
</tr>
<tr>
<td>PBG 410</td>
<td>INTERNSHIP</td>
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<tr>
<td>CH 121</td>
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<tr>
<td>CH 122 &amp; CH 123</td>
<td>*GENERAL CHEMISTRY</td>
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<tr>
<td>CH 122 &amp; CH 123</td>
<td>*GENERAL CHEMISTRY</td>
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**Series B**

<table>
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<tr>
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<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 261 &amp; CH 262</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
</tr>
<tr>
<td>CH 222</td>
<td>GENERAL CHEMISTRY</td>
</tr>
<tr>
<td>CH 262 &amp; CH 263</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 263 &amp; CH 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
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**MTH 111**  *COLLEGE ALGEBRA*  4

**Orientation**

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<tr>
<td>SOIL 101</td>
<td>INTRODUCTION TO CROP SOIL, AND INSECT SCIENCE 1</td>
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**Agricultural Sciences**

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<tr>
<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT 4</td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE                                     4</td>
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<tr>
<td>SOIL 205 &amp; SOIL 206</td>
<td>*SOIL SCIENCE LABORATORY FOR SOIL 205</td>
</tr>
<tr>
<td>or CSS 205</td>
<td>*SOIL SCIENCE                                     4</td>
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<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY                                 3-4</td>
</tr>
<tr>
<td>or CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
</tr>
<tr>
<td>or HORT 301</td>
<td>GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS</td>
</tr>
<tr>
<td>HORT 316</td>
<td>PLANT NUTRITION                                 4</td>
</tr>
<tr>
<td>or SOIL 316</td>
<td>NUTRIENT CYCLING IN AGROECOSYSTEMS</td>
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**Experiential Learning**

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<tr>
<td>SOIL 401</td>
<td>RESEARCH                                         3</td>
</tr>
<tr>
<td>or SOIL 403</td>
<td>THESIS</td>
</tr>
<tr>
<td>or SOIL 410</td>
<td>INTERNSHIP</td>
</tr>
<tr>
<td>or SOIL 407</td>
<td>SEMINAR                                         1</td>
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**Ecology**

Select one of the following courses:  3-4  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
</tr>
<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
</tr>
<tr>
<td>HORT 318</td>
<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
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<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
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**Technology**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>SOIL 468</td>
<td>SOIL LANDSCAPE ANALYSIS                          4</td>
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**Writing Intensive Course (WIC)**

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<tr>
<td>SOIL 395</td>
<td>**WORLD SOIL RESOURCES                          3</td>
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<tr>
<td>or SUS 325</td>
<td>*AG AND ENVIRONMENTAL PREDICAMENTS: A CASE STUDY APPROACH</td>
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**Option Requirements**

Select one of the following tracks:  19-36  

**Soils Research Track**

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>GEO 201</td>
<td>*PHYSICAL GEOLOGY</td>
</tr>
<tr>
<td>or GEO 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
</tr>
<tr>
<td>or GEO 203</td>
<td>*EVOLUTION OF PLANET EARTH</td>
</tr>
<tr>
<td>or GEO 221</td>
<td>*ENVIRONMENTAL GEOLOGY</td>
</tr>
<tr>
<td>or GEO 101</td>
<td>*THE SOLID EARTH</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
</tr>
<tr>
<td>&amp; PH 202</td>
<td>*GENERAL PHYSICS</td>
</tr>
<tr>
<td>or GEO 435</td>
<td>*ENVIRONMENTAL SOIL PHYSICS</td>
</tr>
<tr>
<td>SOIL 445</td>
<td>*ENVIRONMENTAL SOIL CHEMISTRY</td>
</tr>
<tr>
<td>SOIL 455</td>
<td>*BIOLOGY OF SOIL ECOSYSTEMS</td>
</tr>
<tr>
<td>SOIL 466</td>
<td>*SOIL MORPHOLOGY AND CLASSIFICATION</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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**General Soils Track**

<table>
<thead>
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<tbody>
<tr>
<td>GEO 201</td>
<td>*PHYSICAL GEOLOGY</td>
</tr>
<tr>
<td>or GEO 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
</tr>
<tr>
<td>or GEO 203</td>
<td>*EVOLUTION OF PLANET EARTH</td>
</tr>
<tr>
<td>or GEO 221</td>
<td>*ENVIRONMENTAL GEOLOGY</td>
</tr>
<tr>
<td>or GEO 101</td>
<td>*THE SOLID EARTH</td>
</tr>
<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
</tr>
<tr>
<td>or MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
</tr>
<tr>
<td>or MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
</tr>
<tr>
<td>SOIL 466</td>
<td>SOIL MORPHOLOGY AND CLASSIFICATION</td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
</tr>
<tr>
<td>SOIL 395</td>
<td>**WORLD SOIL RESOURCES                          3</td>
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<tr>
<td>or SOIL 395</td>
<td>**WORLD SOIL RESOURCES                          3</td>
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<tr>
<td>or SOIL 435</td>
<td>ENVIRONMENTAL SOIL PHYSICS</td>
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<tr>
<td>or SOIL 445</td>
<td>ENVIRONMENTAL SOIL CHEMISTRY</td>
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<tr>
<td>or SOIL 455</td>
<td>BIOLOGY OF SOIL ECOSYSTEMS</td>
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**Soil Science Electives**

Select a minimum of 12 credits from the following:  12  

**Nutrient Cycling**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>AEC 211</td>
<td>AGRICULTURAL AND FOOD MANAGEMENT</td>
</tr>
<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
</tr>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
</tr>
<tr>
<td>BOT 547</td>
<td>NUTRIENT CYCLING</td>
</tr>
<tr>
<td>CH 130</td>
<td>GENERAL CHEMISTRY OF LIVING SYSTEMS</td>
</tr>
<tr>
<td>CROP 199</td>
<td>SPECIAL STUDIES: ISSUES IN SUSTAINABLE AGRICULTURE</td>
</tr>
<tr>
<td>FES 365</td>
<td>*ISSUES IN NATURAL RESOURCES CONSERVATION</td>
</tr>
<tr>
<td>FES 435/TOX 435</td>
<td>*GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
</tr>
<tr>
<td>HORT 316</td>
<td>PLANT NUTRITION                                 4</td>
</tr>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
</tr>
<tr>
<td>SOIL 395</td>
<td>**WORLD SOIL RESOURCES                          3</td>
</tr>
<tr>
<td>or SOIL 435</td>
<td>ENVIRONMENTAL SOIL PHYSICS</td>
</tr>
<tr>
<td>or SOIL 445</td>
<td>ENVIRONMENTAL SOIL CHEMISTRY</td>
</tr>
<tr>
<td>or SOIL 455</td>
<td>BIOLOGY OF SOIL ECOSYSTEMS</td>
</tr>
<tr>
<td>TOX 430</td>
<td>CHEMICAL BEHAVIOR IN THE ENVIRONMENT</td>
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**Soil Biology/Ecology**

<table>
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<th>Course Title</th>
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<tr>
<td>ATS 564</td>
<td>INTERACTIONS OF VEGETATION AND ATMOSPHERE</td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
</tr>
<tr>
<td>BI 311</td>
<td>GENETICS</td>
</tr>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
</tr>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
</tr>
<tr>
<td>BOT 332</td>
<td>LABORATORY TECHNIQUES IN PLANT BIOLOGY</td>
</tr>
<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
</tr>
<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
</tr>
<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
</tr>
<tr>
<td>FES 341</td>
<td>FOREST ECOLOGY</td>
</tr>
<tr>
<td>FES 435/TOX 435</td>
<td>*GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
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<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
</tr>
<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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<td>MB 448</td>
<td>MICROBIAL ECOLOGY</td>
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**Soil Hydrology**

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<tr>
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<td>HYDROLOGY</td>
</tr>
<tr>
<td>CE 413</td>
<td>GIS IN WATER RESOURCES</td>
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<tr>
<td>FE 430</td>
<td>WATERSHED PROCESSES</td>
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<td>FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
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<tr>
<td>GEO 487</td>
<td>HYDROGEOLOGY</td>
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<tr>
<td>GEO 340</td>
<td>*INTRODUCTION TO WATER SCIENCE AND POLICY</td>
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<tr>
<td>GEO 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
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<td>GEO 411</td>
<td>INTERNATIONAL WATER RESOURCES MANAGEMENT</td>
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<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<td>*GENERAL PHYSICS</td>
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**Spatial Analysis/Land Use**

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
</tr>
<tr>
<td>FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
</tr>
<tr>
<td>FES 365</td>
<td>*ISSUES IN NATURAL RESOURCES CONSERVATION</td>
</tr>
<tr>
<td>GEO 432</td>
<td>APPLIED GEOMORPHOLOGY</td>
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</table>
Crop Science Graduate Major (MS, PhD)

Graduate Areas of Concentration

Crop breeding, genetics and cytogenetics (cereals, oilseeds, potatoes); forage and pasture management; grain crop production; post-harvest seed technology; seed biology; seed crop physiology; seed production; weed biology; weed management

Specific areas of crop science in which a student can prepare for their thesis include cereal breeding and genetics, grass breeding and genetics, forage and pasture management, seed production and technology, seed physiology, seed biology, post-harvest seed technology, and weed science.

Major Code: 1200

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CROP 540</td>
<td>WEED MANAGEMENT</td>
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<tr>
<td>CROP 560</td>
<td>SEED PRODUCTION</td>
<td>3</td>
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<tr>
<td>CROP 580</td>
<td>CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT</td>
<td>4</td>
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<tr>
<td>CROP 590</td>
<td>EXPERIMENTAL DESIGN IN AGRICULTURE</td>
<td>4</td>
</tr>
<tr>
<td>CROP 660</td>
<td>HERBICIDE SCIENCE</td>
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<tr>
<td>CROP 670</td>
<td>PHYSIOLOGY OF CROP YIELD</td>
<td>3</td>
</tr>
<tr>
<td>PGB 550</td>
<td>PLANT BREEDING</td>
<td>4</td>
</tr>
<tr>
<td>PGB 620</td>
<td>DNA FINGERPRINTING</td>
<td>1</td>
</tr>
<tr>
<td>PGB 621</td>
<td>GENETIC MAPPING</td>
<td>1</td>
</tr>
<tr>
<td>PGB 622</td>
<td>MAPPING QUANTITATIVE TRAIT LOCI</td>
<td>1</td>
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<tr>
<td>PGB 650</td>
<td>ADVANCED PLANT BREEDING AND QUANTITATIVE GENETICS</td>
<td>3</td>
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Total Hours: 32

Entomology Graduate Option

This option is offered within the following major(s):
- Crop Science - College of Agricultural Sciences (p. 126)
- Horticulture - College of Agricultural Sciences (p. 174)

The Entomology (ENT) option at Oregon State University embodies the Land Grant mission of integrated research, teaching, and extension in the context of understanding the basic biology of insects and, with this knowledge, then working with insects in natural and/or managed environments. The discipline of entomology at Oregon State University covers behavior, ecology, evolution, physiology, systematics, molecular biology, chemical ecology, plant-insect interactions, pollination by honey bees and native bees, biological control, integrated pest management, and insecticide toxicology. Oregon State Entomology addresses insect-related issues in aquatic and terrestrial systems in natural, agricultural, forested, and urban environments. Entomologists collaborate with plant scientists, physiologists, pathologists, soil scientists, geneticists, molecular biologists, and experts in other fields.

Students in the Entomology option will conduct thesis research related to insects under the supervision of an entomologist associated with the graduate faculty in Crops or Horticulture, and take courses that provide knowledge and understanding about insects. After completing their degree, students will have gained fundamental knowledge in entomology that may be applied in agricultural, aquatic, forested, natural, and urban environments.

Option Code: 5333

<table>
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<tbody>
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<td>THESIS</td>
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<tr>
<td>ENT 507</td>
<td>SEMINAR</td>
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<tr>
<td>ENT 520</td>
<td>INSECT ECOLOGY</td>
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<tr>
<td>ENT 540</td>
<td>ISSUES IN INSECT TOXICOLOGY</td>
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<tr>
<td>ENT 599</td>
<td>SPECIAL TOPICS</td>
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<tr>
<td>IB 540</td>
<td>INSECT PHYSIOLOGY</td>
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Total credits required for graduation: 180

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)
**Plant Breeding and Genetics Graduate Option**

This option is offered within the following major(s):

- Crop Science - College of Agricultural Sciences (p. 126)
- Horticulture - College of Agricultural Sciences (p. 174)

The Plant Breeding and Genetics (PBG) graduate option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is a collaborative discipline spanning everything from classical field approaches to gene manipulation at the molecular level. Breeders regularly cooperate with pathologists, entomologists, soil scientists, physiologists, food scientists, genomicians, molecular biologists and experts in other fields.

Students in the Plant Breeding and Genetics graduate option will learn an interdisciplinary approach to applied plant breeding by taking courses across a broad spectrum of disciplines. The option may be tailored to meet students’ career goals including further graduate study, as well as direct entry into public or private sector breeding programs. After completing the degree, students will have the fundamental knowledge of plant breeding that may be applied to a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products.

**Option Code: 1210**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BOT 575</td>
<td>COMPARATIVE GENOMICS</td>
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<tr>
<td>CROP 590</td>
<td>EXPERIMENTAL DESIGN IN AGRICULTURE</td>
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<tr>
<td>PBG 507</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>PBG 519/HORT 519</td>
<td>CURRENT TOPICS IN PLANT BREEDING AND GENETICS</td>
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<tr>
<td>PBG 530</td>
<td>PLANT GENETICS</td>
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<tr>
<td>PBG 541/MCB 541</td>
<td>PLANT TISSUE CULTURE</td>
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<td>PBG 550</td>
<td>PLANT BREEDING</td>
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<tr>
<td>PBG 620/MCB 620</td>
<td>DNA FINGERPRINTING</td>
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<tr>
<td>PBG 621/MCB 621</td>
<td>GENETIC MAPPING</td>
<td></td>
</tr>
<tr>
<td>PBG 622/MCB 622</td>
<td>MAPPING QUANTITATIVE TRAIT LOCI</td>
<td></td>
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<tr>
<td>PBG 650</td>
<td>ADVANCED PLANT BREEDING AND QUANTITIVE GENETICS</td>
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</table>

**Total Hours: 12**

**Crop Science Graduate Minor**

**Minor Code: 1200**

Approximately two-thirds (30 graduate credits) of the 45-credit total required for a graduate degree should be listed in the major field and one-third (15 graduate credits) in the minor field. The student's advisory committee must include a member from the minor department.

**Minor Code: 1200**

The Plant Breeding and Genetics graduate option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is a collaborative discipline spanning everything from classical field approaches to gene manipulation at the molecular level. Breeders regularly cooperate with pathologists, entomologists, soil scientists, physiologists, food scientists, genomicians, molecular biologists and experts in other fields.

Students in the Plant Breeding and Genetics graduate option will learn an interdisciplinary approach to applied plant breeding by taking courses across a broad spectrum of disciplines. The option may be tailored to meet students’ career goals including further graduate study, as well as direct entry into public or private sector breeding programs. After completing the degree, students will have the fundamental knowledge of plant breeding that may be applied to a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products.

**Option Code: 1210**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>CROP 300/HORT 300</td>
<td>CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS</td>
<td>4</td>
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<tr>
<td>Select one of the following:</td>
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<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>&amp; SOIL 206</td>
<td>*SOIL SCIENCE LABORATORY FOR SOIL 205</td>
<td></td>
</tr>
<tr>
<td>CSS 305</td>
<td>PRINCIPLES OF SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>&amp; CSS 306</td>
<td>PRINCIPLES OF SOIL SCIENCE AND PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS (EOU Campus only)</td>
<td></td>
</tr>
<tr>
<td>Select a minimum of 15-16 credits of the following:</td>
<td></td>
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</tr>
<tr>
<td>AGRI 38</td>
<td>EXPLORING WORLD AGRICULTURE</td>
<td>15-16</td>
</tr>
<tr>
<td>CROP 199</td>
<td>SPECIAL STUDIES: ISSUES IN SUSTAINABLE AGRICULTURE</td>
<td></td>
</tr>
<tr>
<td>CROP 310</td>
<td>FORAGE PRODUCTION</td>
<td></td>
</tr>
<tr>
<td>CROP 319</td>
<td>PRINCIPLES OF FIELD CROP PRODUCTION</td>
<td></td>
</tr>
<tr>
<td>CROP 330</td>
<td>*WORLD FOOD CROPS</td>
<td></td>
</tr>
<tr>
<td>CROP 407</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>CROP 433/HORT 433</td>
<td>SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS</td>
<td></td>
</tr>
<tr>
<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>CROP 460</td>
<td>SEED PRODUCTION</td>
<td></td>
</tr>
<tr>
<td>CROP 463</td>
<td>SEED BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>CROP 480/HORT 480</td>
<td>CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>CROP 499</td>
<td>SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>CSS 320</td>
<td>PRINCIPLES OF OIL AND FIBER CROP PRODUCTION (EOU Campus only)</td>
<td></td>
</tr>
<tr>
<td>CSS 321</td>
<td>PRINCIPLES OF CEREAL CROP PRODUCTION (EOU Campus only)</td>
<td></td>
</tr>
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<td>CSS 322</td>
<td>PRINCIPLES OF POTATO PRODUCTION (EOU Campus only)</td>
<td></td>
</tr>
<tr>
<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>PBG 430</td>
<td>PLANT GENETICS</td>
<td></td>
</tr>
<tr>
<td>PBG 450</td>
<td>PLANT BREEDING</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours: 26-27**

* Baccalaureate Core Course (BCC)

**Minor Code: 119**

Students pursuing a minor in Crop Science are required to receive a grade of C or better in all CROP, CSS, ENT, HORT, PBG, and SOIL courses taken to complete the minor.

To earn the Crop Science minor, students must complete the courses listed below to total 27 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 575</td>
<td>COMPARATIVE GENOMICS</td>
<td>12</td>
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<tr>
<td>CROP 590</td>
<td>EXPERIMENTAL DESIGN IN AGRICULTURE</td>
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<tr>
<td>PBG 507</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>PBG 519/HORT 519</td>
<td>CURRENT TOPICS IN PLANT BREEDING AND GENETICS</td>
<td></td>
</tr>
<tr>
<td>PBG 530</td>
<td>PLANT GENETICS</td>
<td></td>
</tr>
<tr>
<td>PBG 541/MCB 541</td>
<td>PLANT TISSUE CULTURE</td>
<td></td>
</tr>
<tr>
<td>PBG 550</td>
<td>PLANT BREEDING</td>
<td></td>
</tr>
<tr>
<td>PBG 620/MCB 620</td>
<td>DNA FINGERPRINTING</td>
<td></td>
</tr>
<tr>
<td>PBG 621/MCB 621</td>
<td>GENETIC MAPPING</td>
<td></td>
</tr>
<tr>
<td>PBG 622/MCB 622</td>
<td>MAPPING QUANTITATIVE TRAIT LOCI</td>
<td></td>
</tr>
<tr>
<td>PBG 650</td>
<td>ADVANCED PLANT BREEDING AND QUANTITIVE GENETICS</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours: 12**

**Crop Science Minor**

**Also available at LaGrande.**

**Minor Code: 119**

Students pursuing a minor in Crop Science are required to receive a grade of C or better in all CROP, CSS, ENT, HORT, PBG, and SOIL courses taken to complete the minor.

To earn the Crop Science minor, students must complete the courses listed below to total 27 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>CROP 300/HORT 300</td>
<td>CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>&amp; SOIL 206</td>
<td>*SOIL SCIENCE LABORATORY FOR SOIL 205</td>
<td></td>
</tr>
<tr>
<td>CSS 305</td>
<td>PRINCIPLES OF SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>&amp; CSS 306</td>
<td>PRINCIPLES OF SOIL SCIENCE AND PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS (EOU Campus only)</td>
<td></td>
</tr>
<tr>
<td>Select a minimum of 15-16 credits of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGRI 38</td>
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<td>PRINCIPLES OF FIELD CROP PRODUCTION</td>
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<td>*WORLD FOOD CROPS</td>
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<tr>
<td>CROP 407</td>
<td>SEMINAR</td>
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<td>CROP 433/HORT 433</td>
<td>SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS</td>
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<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
<td></td>
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<tr>
<td>CROP 460</td>
<td>SEED PRODUCTION</td>
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<tr>
<td>CROP 463</td>
<td>SEED BIOLOGY</td>
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<td>CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT</td>
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<tr>
<td>ENT 311</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>PBG 450</td>
<td>PLANT BREEDING</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours: 26-27**

* Baccalaureate Core Course (BCC)

**Minor Code: 119**
Soil Science Graduate Major (MS, PhD)

Graduate Areas of Concentration

Environmental soil science, forest soils, nutrient cycling, soil geochemistry, soil conservation and land use, soil fertility and plant nutrition, soil genesis and classification, soil microbiology, soil physics

Faculty research specializations in soil science include ecosystem services, forest soils, management of soil nutrients, mineral-organic matter interactions, soil archeology, soil biogeochemistry, soil microbial ecology, sustainable cropping systems, soil geomorphology, soil genesis, and soil hydrology. Amongst research institutions worldwide, Oregon State campus lands present the most soil diversity for the study of associated problems.

Major Code: 1600

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>SOIL 513</td>
<td>(Terminated Summer 2019)</td>
<td>4</td>
</tr>
<tr>
<td>SOIL 523</td>
<td>PRINCIPLES OF STABLE ISOTOPES</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 525</td>
<td>MINERAL-ORGANIC MATTER INTERACTIONS</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 535</td>
<td>SOIL PHYSICS</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 536</td>
<td>VADOSE ZONE HYDROLOGY LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td>SOIL 545</td>
<td>ENVIRONMENTAL SOIL CHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 555</td>
<td>BIOLOGY OF SOIL ECOSYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>SOIL 566</td>
<td>SOIL MORPHOLOGY AND CLASSIFICATION</td>
<td>4</td>
</tr>
<tr>
<td>SOIL 568</td>
<td>SOIL LANDSCAPE ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>SOIL 645</td>
<td>SOIL MICROBIAL ECOLOGY</td>
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<tr>
<td><strong>Total Hours</strong></td>
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<td><strong>32</strong></td>
</tr>
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</table>

Minor Code: 1600

Soil Science Graduate Minor

Approximately two-thirds (30 graduate credits) of the 45-credit total required for a graduate degree should be listed in the major field and one-third (15 graduate credits) in the minor field. The student's advisory committee must include a member from the minor department.

Minor Code: 1600

Soil Science Minor

Also available at LaGrande.

Minor Code: 160

To earn the Soil Science minor, students must complete the courses listed below to total 27 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Core</strong></td>
<td></td>
<td><strong>3-4</strong></td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>CSS 305 &amp; CSS 306</td>
<td>PRINCIPLES OF SOIL SCIENCE and PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>SOIL 316</td>
<td>NUTRIENT CYCLING IN AGROECOSYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>or CSS 315</td>
<td>*NUTRIENT MANAGEMENT AND CYCLING</td>
<td></td>
</tr>
</tbody>
</table>

Entomology

Graduate students have the option of obtaining their degree in the specific academic department of their major professor.

Graduate Area of Concentration

Graduate students pursuing an entomology area of concentration have the opportunity to study and conduct research within a number of graduate programs across the university in the Departments of Horticulture, Crop and Soil Science, Fisheries and Wildlife, and Forest Ecosystems and Society. Graduate students obtain their degree within the academic department of their major professor.

Entomologists continue to be at the forefront of basic and applied research in molecular biology, ecology, evolutionary biology, biodiversity, and pest management. The modern fields of physiology, ecology and systematics have their origins in research originally undertaken with insects, and entomologists help lead these disciplines today. Given the unique importance of insects in biodiversity and ecosystem processes, their roles in crop production and public health, and their value as model organisms for the exploration of basic scientific questions, there is demand for graduates who have acquired entomological expertise.

The Entomology Program is a component of the Agricultural Experiment Station, which has many research facilities for students and staff, including farms, greenhouses, an aquatic insect laboratory, and a forest insect research laboratory. In addition to OSU faculty, state and federal entomologists stationed across the state are available for consultation in their fields of specialization. The Oregon State Arthropod Collection has nearly 3,000,000 specimens of insects and mites and is a recognized center for research in insect systematics and biodiversity.
Undergraduate Programs

Minor
- Entomology (p. 131)

Graduate Programs

Major
- Entomology (p. 131)

Minor
- Entomology (p. 131)

W. Daniel Edge, Program Contact
College of Agricultural Sciences
430E StAg
Oregon State University
Corvallis, OR 97331
Phone: 541-737-2910
Email: daniel.edge@oregonstate.edu
Website: http://entomology.oregonstate.edu/

Faculty

Botany and Plant Pathology MeEvoy
Crop and Soil Science Dreves, Reitz, Rao, Rondon
Environmental and Molecular Toxicology Jepson
Fisheries and Wildlife DeBano, Wooster
Forest Ecosystems and Society Ross
Horticulture Choi, Hooven, Lambrinos, Langellotto-Rhodaback, Lee, Miller, Rosetta, Sagil, Shearer, Walton, Wiman
Zoology Giebultowicz, Lytle, Maddison, Marshall

Entomology

ENT 101. INTRODUCTION TO CROP, SOIL, AND INSECT SCIENCE. (1 Credit)
Introduces students with interests in crop, soil, and insect sciences to educational and professional opportunities in these disciplines. Speakers will discuss opportunities in research and academia as well as in the applied professional job market. CROSSLISTED as CROP 101/ENT 101/SOIL 101.
Equivalent to: CROP 101, HORT 101, SOIL 101

ENT 300. *PLAGUES, PESTS, AND POLITICS. (3 Credits)
Integration and interaction of agricultural and public health aspects of entomology in society and history. CROSSLISTED as ENT 300/HORT 330. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: BI 370, HORT 330

ENT 311. INTRODUCTION TO INSECT PEST MANAGEMENT. (4 Credits)
Identification, biology and management of injurious and beneficial insects. Concurrent laboratory is designed to provide hands-on experience with identification of insect groups of relevance to agricultural cropping systems. Lec/lab.
Equivalent to: CSS 311
Recommended: Entomology course work or one year college biology.

ENT 322. HONEY BEE BIOLOGY AND BEEKEEPING. (3 Credits)
In this introduction to the fascinating honey bee and its biology, honey bees are used as model organisms to illustrate general principles of biology, entomology, and sociobiology. Students will learn the basics of beekeeping, have an opportunity to manipulate honey bee colonies, and gain hands-on experience, prevailing winter weather permitting.

ENT 331. *POLLINATORS IN PERIL. (3 Credits)
Pollinators, human influences on pollination systems, and the potential consequences of pollinator decline. An introduction to the skills needed to investigate media reports and multidisciplinary scientific research. Effects of pesticides, habitat fragmentation, climate change, invasive species, pests, pathogens, and other threats to pollinators in critical natural and agricultural systems around the world. CROSSLISTED as ENT 331/HORT 331. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HORT 331
Recommended: Completion of a Baccalaureate Core biological science course.

ENT 401. RESEARCH. (1-16 Credits)
Work on approved problems carried on in the library, laboratory or field. This course is repeatable for 16 credits.

ENT 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 405. READING AND CONFERENCE. (1-16 Credits)
Reading and discussions on special topics. This course is repeatable for 16 credits.

ENT 407. SEMINAR. (1-2 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ENT 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 420. INSECT ECOLOGY. (3 Credits)
Insect ecology, evolution, and management. Biophysical ecology; foraging and feeding; life cycles; population dynamics, regulation, and control; species interactions including herbivore-plant, predator-prey, parasite-host, competition, and mutualism; diversity, food web structure, agricultural ecology, exercises merge models, experiments, and sampling. Offered on even years.
Recommended: BI 370

ENT 440. ISSUES IN INSECT TOXICOLOGY. (3 Credits)
Introduction to concepts and mechanisms associated with molecular toxicology as it relates to insects, including interactions with naturally occurring and synthetic compounds. Overview of current research in insect toxicology including resistance to pesticides, protection of non-target species, and use of insects as model organisms. Discussion of laboratory and field approaches and potential strategies to address issues in insect toxicology.
Recommended: Background in basic chemistry and biology

ENT 444. INSECT AGROECOLOGY. (3 Credits)
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape. CROSSLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: HORT 444
Recommended: General background or previous course work in entomology.

ENT 499. SPECIAL TOPICS. (1-6 Credits)
Equivalent to: FW 499
This course is repeatable for 6 credits.
ENT 501. RESEARCH. (1-16 Credits)
Work on approved problems carried on in the library, laboratory or field. This course is repeatable for 16 credits.

ENT 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENT 505. READING AND CONFERENCE. (1-16 Credits)
Reading and discussions on special topics. This course is repeatable for 16 credits.

ENT 507. SEMINAR. (1-2 Credits)
Graded P/N. This course is repeatable for 16 credits.

ENT 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 509. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/ PBG 509/SOIL 509.
Equivalent to: CROP 509, PBG 509, SOIL 509
This course is repeatable for 9 credits.

ENT 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 518. CURRENT TOPICS IN ENTOMOLOGY. (2 Credits)
A core course of the Horticulture graduate program. Provides an advanced understanding of entomology and its relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as ENT 518/HORT 518.
Equivalent to: HORT 518
This course is repeatable for 12 credits.

ENT 520. INSECT ECOLOGY. (3 Credits)
Insect ecology, evolution, and management. Biophysical ecology; foraging and feeding, life cycles; population dynamics, regulation, and control; species interactions including herbivore-plant, predator-prey, parasitoid-host, competition, and mutualism; diversity, food web structure, agricultural ecology, exercises merge models, experiments, and sampling. Offered even years. Recommended: BI 370 and Z 365

ENT 523. ORGANIC BEEKEEPING AND HONEY PRODUCTION. (3 Credits)
In this introduction to the fascinating honey bee and its biology, honey bees are used as model organisms to illustrate general principles of biology, entomology, and sociobiology. Learn the basics of beekeeping, organic beekeeping and honey production. Examine the culture and certification of organic and conventional systems of honey production.

ENT 540. ISSUES IN INSECT TOXICOLOGY. (3 Credits)
Introduction to concepts and mechanisms associated with molecular toxicology as it relates to insects, including interactions with naturally occurring and synthetic compounds. Overview of current research in insect toxicology including resistance to pesticides, protection of non-target species, and use of insects as model organisms. Discussion of laboratory and field approaches and potential strategies to address issues in insect toxicology. Recommended: Background in basic chemistry and biology

ENT 542. PRINCIPLES OF INTEGRATED PEST MANAGEMENT: SYSTEMS DESIGN. (4 Credits)
Principles of integrated pest management design focusing on the use of systems analysis as a means to integrate management tactics, environmental and biological monitoring, pest control models, and implementation elements into a cohesive whole. Introduction to integrated pest management on websites. Students will design a hypothetical crop-pest management system. Lec/lab.
Equivalent to: HORT 542
Recommended: ENT 311

ENT 544. INSECT AGROECOLOGY. (3 Credits)
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape. CROSSLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: HORT 544
Recommended: General background or previous course work in entomology.

ENT 548. INTEGRATED PEST MANAGEMENT IN ORGANIC SYSTEMS. (3 Credits)
Prevention, detection, and management of pests and diseases in organic plant production systems. Content includes activities that require students to expand their experience of pest management in their locality by incorporating new and emergent technology for monitoring, diagnosing and managing insects, pathogen, and weed pests and their impacts on crops. Discussions will be centered on the logistics and potential of new technologies in pest management, incorporating biological, ecological and sustainable agriculture concepts. Recommended: ENT 311 with minimum grade of D-

ENT 599. SPECIAL TOPICS. (1-16 Credits)
Important topics of current interest in the areas of systematics, insect physiology and toxicology, ecology and behavior, and pest management. Course content and title will change with each offering. This course is repeatable for 16 credits.

ENT 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENT 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: CROP 509, PBG 609, SOIL 609
This course is repeatable for 9 credits.

ENT 699. SPECIAL TOPICS. (1-16 Credits)
Important topics of current interest in the areas of systematics, insect physiology and toxicology, ecology and behavior, and pest management. Course content and title will change with each offering. This course is repeatable for 16 credits.
Entomology Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Entomology

The Entomology Graduate Program offers qualified candidates opportunities for graduate study and research leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. In keeping with traditional areas of strength at the university, a number of major research programs in entomology deal with problems in agriculture, forestry, and environmental quality. Integrated pest management techniques are emphasized in the solution of many of these problems.

For additional information on the Entomology Graduate Program, see the program website (http://entomology.oregonstate.edu/).

Major Code: 5350

There are no specific course requirements for entomology graduate degrees. Each student will work with their major professor and/or graduate committee to establish a program of study.

Entomology Graduate Minor

Minor Code: 5350

Entomology Minor

The Entomology minor is available to all OSU students.

Minor Code: 472

A minimum of 27 credits is required, at least 12 of which must be upper-division credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>or Z 361</td>
<td>INVERTEBRATE BIOLOGY</td>
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</tr>
<tr>
<td>or Z 365</td>
<td>BIOLOGY OF INSECTS</td>
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Select 23-24 credits from the following: 23-24

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>ENT 300/HORT 330</td>
<td>*PLAGUES, PESTS, AND POLITICS</td>
</tr>
<tr>
<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
</tr>
<tr>
<td>ENT 322</td>
<td>HONEY BEE BIOLOGY AND BEEKEEPING</td>
</tr>
<tr>
<td>ENT 331/HORT 331</td>
<td>*POLLINATORS IN PERIL</td>
</tr>
</tbody>
</table>

Financial support is available to most students in the program through graduate research assistantships or from an NIEHS environmental health predoctoral training program. Completing the application by the end of January assures full consideration for funding for fall of that year.

Students who wish to enter the program should have a BS degree (or equivalent) in a science related field and are expected to select an MS or PhD curriculum related to their own area of specialization. Students will take a core set of courses and will attend and participate in the toxicology seminar class. Courses in toxicology also may be taken by students in engineering or the basic sciences.

PhD Preliminary Exam Guidelines

Objective

The overall objective of the preliminary examination for advancement to PhD candidacy should assess whether a graduate student has the capacity and promise to:

1. understand the basic science of environmental and molecular toxicology;
2. be a creative and critical thinker;
3. understand the scientific literature;
4. conduct original and independent research; and
5. communicate the ideas and results of experiments.

Thus, the ideal examination format would select from these characteristics and prepare the student for the selective pressures that will be encountered upon completing the Environmental and Molecular Toxicology PhD degree program. In order to maintain high standards and produce quality graduate students, the examination must be rigorous and
challenging. In addition, the exam format should set specific limits on the amount of time that the student dedicates to this process.

**Exam Format**

The preliminary examination format outlined below consists of both oral and written elements. This examination must be completed no later than the end of the eighth academic term (not including summer terms) after entering the program. In most cases, the student would schedule the exam in the fall term of the third year of residence although students may take the exam earlier, after completing at least one year in the program. The examination consists of a written and oral presentation of a research proposal that cannot be closely related to the student’s thesis project. As outlined, the student’s ability to develop, research, and defend original scientific ideas would be evaluated. The student is expected to demonstrate a capacity for critical thinking and a command of the specific field of focus. In addition, the student’s general knowledge of environmental and molecular toxicology would be evaluated.

**Procedural Outline**

**Research Proposal (written/oral)**

1. Student submits outline descriptions (required elements listed below) of two potential research projects. The subject of each project must be chosen by the student based on their knowledge and review of the literature, and must describe original, hypothesis-driven research. The proposed projects cannot have been defined previously in published or unpublished form (i.e., manuscript, abstract, database of funded projects, submitted grant application, etc.), or cannot be known to be in progress. Proposed research also must not be closely related to the thesis research of the student. ‘Closely related’ is defined as any research that conceivably could be part of the student’s thesis or that conceivably might be initiated by the student’s major professor.

   **Project outlines (limited to one page each) must include:**
   
   a. Description of an unresolved question relevant to the field of environmental and molecular toxicology. (1–3 sentences)
   
   b. Statement of specific hypothesis to be tested. (1–2 sentences)
   
   c. Description of an experimental approach designed to test the hypothesis, including a minimum of two specific aims, and a statement of the rationale (justification) for the proposed approach. (2–6 sentences)
   
   d. Statement of the significance of the proposed research. (1–2 sentences)

2. The student’s graduate committee reviews both outlines and approves one topic to be developed into a written proposal. The research topic is chosen based on originality, quality, potential significance, and the likelihood of expanding the student’s education and training. Approval of the topic would occur within one week after the outlines are submitted. During this period, the outlines would be returned to the student, and the student would receive feedback from the committee concerning the quality and design of the outlined projects. Major strengths and weaknesses in the experimental design or rationale would be identified.

3. The student develops a written research proposal using the format and topic guidelines of application for the EPA, NIH, NSF, or other appropriate granting agency. The written proposal must be completed and returned to the committee within four weeks after the topic was approved. The scope of the project will be equivalent to that of a ‘pilot project’ proposal and if conducted would be expected to take approximately one year of research time. The proposal is limited in length to 10 pages of double-spaced text (12 point font with 0.5-inch margins), and must include the following elements:

   a. **Specific Aims.** State concisely and realistically what the research described in this application is intended to accomplish and what hypothesis is to be tested. Do not exceed one page.

   b. **Background and Significance.** Briefly describe the background to the present proposal, critically evaluating the existing literature and specifically identifying gaps, which the project is intended to fill. State concisely the importance of the research described in this application, and relate the specific aims to the long-term objectives. Limited to two pages.

   c. **Research Design and Methods.** Discuss in detail the experimental design and procedures to be used to accomplish the specific aims of the project. Describe the protocols to be used and the tentative sequence of investigation. Include the means by which the data will be analyzed and interpreted. Discuss the potential difficulties and limitations of the proposed research and alternative approaches to achieve the aims. Point out any procedures, situations, or materials that may be hazardous to personnel and the precautions to be exercised. Limited to seven pages.

   d. **Literature Cited.** Do not scatter literature citations throughout the text. List them at the end of the proposal. All papers cited in the text must be listed in the reference list and vice versa. The list of literature citations at the end of the proposal does not count toward the 10-page limit.

   e. **Appendix.** Students may include additional figures in an appendix, limited to five pages. The appendix may not be used to circumvent the page limits of the proposal.

4. The oral exam should be scheduled within two weeks of completion of the written proposal. This deadline can be extended with the approval of the student’s graduate committee.

5. During the exam, the student would present the research plan and defend the experimental approach. The presentation would involve a seminar format with slides/overheads and would be expected to last no longer than 30 minutes. Following the presentation, the student would be judged on the soundness of the hypothesis, their understanding of the subject matter, their ability to defend the proposed experimental design, and their general knowledge of the field of environmental and molecular toxicology. The exam is expected to last approximately two hours and is limited in length to three hours.

**Examination Committee**

The examination committee is the graduate student’s doctoral committee. The doctoral committee consists of a minimum of five members of the graduate faculty, including at least two members of the major department and a representative of the Graduate Council. If a minor is declared, the committee must include a member from the minor department. All committee members must be on the graduate faculty with appropriate authorization to serve on the student’s committee. The major professor would serve as the chairperson of the committee to oversee the exam. The decision concerning whether the student merits advancement to PhD candidacy would be the responsibility of the examination committee.

**Evaluation**

The basic question for the committee is whether or not they believe the student is adequately prepared to conduct doctoral level research and has a good chance of successfully completing such research. Following
a discussion of the student's performance on the examination, each
committee member is then asked to vote on the basic question. It is
appropriate for secret ballots to be used, and secret ballots must be used
if requested by any committee member.

If there is one negative vote on this question, the student will pass. If
there are two or more negative votes on this question, the student will not
pass.

If the committee decision is that the student has not passed the
examination, the committee must then decide whether or not to allow the
student to take a re-examination. If the majority of the committee votes
in favor of a re-examination, the recommendation for re-examination
should be recorded. In addition, the committee must set a time interval
that must elapse before the re-examination is permitted. If the majority
of the committee votes against a re-examination, the recommendation to
terminate the student's work toward this degree should be recorded.

Undergraduate Programs

Minor
  • Toxicology (p. 135)

Graduate Programs

Major
  • Toxicology (p. 135)

Minor
  • Toxicology (p. 135)

Craig B. Marcus, Head
1007 Agricultural and Life Sciences
Oregon State University
Corvallis, OR 97331-7301
Phone: 541-737-1808
Email: craig.marcus@oregonstate.edu
Website: http://emt.oregonstate.edu/

Faculty

Professors Baird, Dashwood, Field, Hays, Jenkins, Jepson, Kerkvliet,
Miller, Williams
Associate Professors Anderson, Buermeyer, Simonich, Sudakin, Tanguay
Assistant Professors Bennett, Harper, Kolluri, Stone
Senior Research Assistants Hoffman, Johnson, Siddens

Adjunct/Courtesy/Affiliate Faculty

Allen, Fairbrother, Gold, Ho, Iversen, Kisby, Koop, Lein, Proteau, Simon,
Stubblefield, Turker

Toxicology

TOX 003. UNDERGRADUATE RESEARCH. (0 Credits)
Students engage in research activities appropriate to their discipline;
and through the research experience, to acquire skills, techniques, and
knowledge relevant to their field of study. In consultation with a faculty
mentor, students will engage in research activity, and make and execute a
plan for a project.

TOX 230X. HUMANS AND THE OCEAN. (3 Credits)
An introduction to marine science and the history of humans' interaction
with the ocean. Lectures, group and individual library research, fieldtrips,
and assignments will collate approaches from marine science, history,
literary study, and other scientific and humanistic disciplines to introduce
course material. Topics include oceanographic exploration, fishing and
overfishing, and marine pollution. CROSSLISTED as ENG 230X/FW 230X/
TOX 230X.
Equivalent to: ENG 230X, FW 230X

TOX 360. THE WORLD OF POISONS. (3 Credits)
Provides a basic understanding of how we are exposed and respond to
chemicals, examples of human diseases associated with toxic insult,
the role of technology and the interface of society and toxicology in risk
perception and legislation. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: One 3-credit course in chemistry or one 3-credit course in
biology.

TOX 401. RESEARCH. (1-16 Credits)
Equivalent to: AC 401
This course is repeatable for 16 credits.

TOX 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AC 405
This course is repeatable for 16 credits.

TOX 411. FUNDAMENTALS OF TOXICOLOGY. (3 Credits)
Introduction to the discipline of toxicology. Examination of the
basic concepts that define how chemicals are absorbed, distributed,
metabolized, and eliminated by the body. Overview of associated dose/
response relations.
Prerequisites: BB 350 (may be taken concurrently) with D- or better or
BB 450 (may be taken concurrently) with D- or better or BB 490 (may be
taken concurrently) with D- or better

TOX 413. ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT. (3
Credits)
Procedures for defining exposure and the use of toxicological data in
defining risk assessment. Recent application of mechanistic concepts
are reviewed.
Prerequisites: TOX 411 with D- or better

TOX 429. TOXIC SUBSTANCES IN FOOD. (3 Credits)
Toxicology and epidemiology of human exposures to pesticides and food
toxicants.
Prerequisites: BB 350 (may be taken concurrently) with D- or better or
BB 450 (may be taken concurrently) with D- or better or BB 490 (may be
taken concurrently) with D- or better
Equivalent to: TOX 429H

TOX 430. CHEMICAL BEHAVIOR IN THE ENVIRONMENT. (3 Credits)
Applications of chemical concepts in the definition and solution of
pollution problems; analytical considerations, thermodynamic
factors influencing movement of chemicals, physical and metabolic
transformations occurring in the environment.
Prerequisites: CH 123 with D- or better or CH 331 with D- or better
TOX 435. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FES 435, FES 435H, TOX 435H
Recommended: One quarter each of biology and chemistry

TOX 435H. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: BI 435, BI 435H, FES 435, FS 435, FS 435H, TOX 435
Recommended: One quarter each of biology and chemistry

TOX 455. ECOTOXICOLOGY: AQUATIC ECOSYSTEMS. (3 Credits)
Focuses on transport, fate, and effects of toxic substances in freshwater ecosystems. There is special emphasis on impacts on fish.
Prerequisites: CH 331 with D- or better

TOX 480. COMPUTATIONAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Provides an in-depth understanding of the current systems biology paradigm for chemical risk and drug safety assessment. Learn about novel technologies in computational chemistry, molecular biology and systems biology used to develop methods for risk assessment, including approaches for chemical prioritization for screening and testing, predictive models for high-throughput hazard identification and utilization of "big data" to determine chemical mechanisms of action and toxicity pathways. Apply these approaches to specific case studies in risk analysis, environmental health and toxicology.
Recommended: One year college chemistry and biology plus introductory toxicology or biochemistry

TOX 490. ENVIRONMENTAL FORENSIC CHEMISTRY. (3 Credits)
Principles of Good Laboratory Practice Standards, methodology, utility and limitations of chemical forensic methods as applied to real investigations.
Recommended: One year of college chemistry and one term of organic chemistry

TOX 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

TOX 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 511. FUNDAMENTALS OF TOXICOLOGY. (3 Credits)
Introduction to the discipline of toxicology. Examination of the basic concepts that define how chemicals are absorbed, distributed, metabolized, and eliminated by the body. Overview of associated dose/response relations.
Prerequisites: BB 550 (may be taken concurrently) with C or better or BB 590 (may be taken concurrently) with C or better

TOX 512. TARGET ORGAN TOXICOLOGY. (3 Credits)
Examination of toxicological effects of chemicals at organ level. Normal physiology of the organ system is received.
Prerequisites: TOX 511 with C or better

TOX 513. ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Procedures for defining exposure and the use of toxicological data in defining risk assessment. Recent application of mechanistic concepts are reviewed.
Prerequisites: TOX 511 with C or better

TOX 529. TOXIC SUBSTANCES IN FOOD. (3 Credits)
Toxicology and epidemiology of human exposures to pesticides and food toxicants.
Recommended: Completion or concurrent enrollment in BB 350, BB 450 or BB 490

TOX 530. CHEMICAL BEHAVIOR IN THE ENVIRONMENT. (3 Credits)
Applications of chemical concepts in the definition and solution of pollution problems; analytical considerations, thermodynamic factors influencing movement of chemicals, physical and metabolic transformations occurring in the environment.
Recommended: CH 106 and CH 331 and graduate standing.

TOX 535. GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535.
Equivalent to: BI 535, FES 535, FS 535, MCB 535
Recommended: One quarter each of biology and chemistry

TOX 555. ECOTOXICOLOGY: AQUATIC ECOSYSTEMS. (3 Credits)
Focuses on transport, fate, and effects of toxic substances in freshwater ecosystems. There is special emphasis on impacts on fish.
Recommended: CH 331

TOX 557. SCIENTIFIC SKILLS AND ETHICS. (3 Credits)
Acquire a multitude of skills to launch and maintain productive extramurally funded careers as research scientists. Explore the ethical practices, data sharing approaches, and compliance requirements needed to conduct research. Examine the ethical use of human subjects and animals in research. Explore the changing landscape of intellectual property and commercialization policies for scientists. Introduces communication strategies for effective interactions with scientific peers, the general public and research sponsors.
Equivalent to: MCB 557
TOX 575. ADVANCED XENOBIOTIC METABOLISM AND DISPOSITION. (2 Credits)
Course will focus on structure, function and regulation of specific proteins that function in uptake, distribution, metabolism, and excretion of drugs and other chemicals that are foreign to the body (xenobiotics). The course will focus on proteins which are termed Phase I and Phase II xenobiotic metabolizing enzymes and xenobiotic transporters. There will be an emphasis on Cytochrome P450 enzymes and hepatic and renal xenobiotic transporter proteins and their key roles in xenobiotic metabolism and excretion.
Recommended: TOX 512

TOX 580. COMPUTATIONAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Provides an in-depth understanding of the current systems biology paradigm for chemical risk and drug safety assessment. Learn about novel technologies in computational chemistry, molecular biology and systems biology used to develop methods for risk assessment, including approaches for chemical prioritization for screening and testing, predictive models for high-throughput hazard identification and utilization of "big data" to determine chemical mechanisms of action and toxicity pathways. Apply these approaches to specific case studies in risk analysis, environmental health and toxicology.
Recommended: One year college chemistry and biology plus introductory toxicology or biochemistry

TOX 590. ENVIRONMENTAL FORENSIC CHEMISTRY. (3 Credits)
Principles of Good Laboratory Practice Standards, methodology, utility and limitations of chemical forensic methods as applied to real investigations.
Recommended: One year of college chemistry and one term of organic chemistry.

TOX 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

TOX 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 611. TESTING FOR GENOTOXICITY. (4 Credits)
A lab-based course geared toward toxicology, biochemistry, biology, food science, nutrition, pharmacy and MCB students. Introduces principles and methods of several key assays used to screen for DNA damage and mutation. These tests will include the following: (i) Salmonella mutagenicity assay (Ames test), (ii) single cell gel electrophoresis ('comet') assay, (iii) micronucleus assay, and (iv) PCR-based single strand conformation polymorphism (SSCP) screening for oncogene/tumor suppressor gene mutation in cancers. This 2-week, intensive lab/lecture class runs Mon-Fri in the LPSC during the first session of summer term. Each day includes laboratory work and a 2-hour lecture covering basic principles of the assays, as well as technical details of the experiment for the day.
Prerequisites: TOX 514 with C or better
Recommended: BB 400 series, prior course work on DNA repair and mutagenesis

TOX 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Toxicology Graduate Major (MS, PhD)
Graduate Areas of Concentration

Environmental chemistry and ecotoxicology, mechanistic toxicology, molecular and cellular toxicology, neurotoxicology

The Department of Environmental and Molecular Toxicology provides students with a fundamental knowledge of toxicology that prepares them for responsible positions in research and development, academia, government, professional services, or research foundations.

The graduate faculty includes scientists with a special interest in the application of chemistry, biochemistry, molecular biology, pharmacology, pathology, neuroscience, immunology and ecology to problems in toxicology. The concentration in neurotoxicology is an interinstitutional alliance with Oregon Health and Science University (OHSU). Students will be affiliated with and advised by associated faculty.

Minimal prerequisites for admission include one year each of biology, organic chemistry, physics, and statistics. Students who do not meet all of these requirements may be admitted if their academic record is otherwise outstanding.

Major Code: 9930

For the MS, and PhD degrees, students are required to take a core curriculum plus elective courses connected with their particular area of specialization. In addition to completing appropriate course work, students will undertake a thesis research project related to some aspect of toxicology. Participation in the seminar program (a one-hour per week seminar) is mandatory.

Major Code: 9930

Toxicology Graduate Minor

Minor Code: 9930

Toxicology Minor

The Toxicology minor provides basic and applied science majors sufficient background for technical work in toxicology.

Minor Code: 618
Fisheries and Wildlife Department

Fisheries and wildlife prepares students for professional careers in fisheries and wildlife as research scientists, biologists, managers, educators, and administrators. Oregon State University is strategically located for the study of fisheries and wildlife, surrounded by diverse ecosystems including the Pacific Ocean and coastal estuaries, many small and large rivers, lowland valleys, mountains and the high desert. Courses include traditional classroom experiences and laboratories, often enriched by field trips to nearby state fish hatcheries, national forests and wildlife refuges. We also offer experiential learning opportunities at the Hatfield Marine Science Center on the coast in Newport. In addition to our full-time faculty, FW students benefit from courses and mentoring provided by scientists with the Oregon Cooperative Fish and Wildlife Research Unit, Oregon Department of Fish and Wildlife, and several federal research centers.

The undergraduate curriculum is designed to develop a solid background in biology and ecology for our students as the basis for careers in resource science, conservation and management. However, FW is not simply a biological discipline. Professionals must weigh social considerations when formulating conservation and management strategies and policies. Consequently, biological, social, economic, and political science courses are integrated into the curriculum.

The undergraduate curriculum is composed of core courses and a specialization. The core represents the educational foundation for fish and wildlife conservation while the specialization provides each student with an opportunity to build a curriculum to meet specific goals. Our capstone courses emphasize critical thinking in natural resource science and management, as well as science communication and outreach. Students planning to transfer to FW should focus on courses in general biology, general chemistry, physical science, and mathematics during their freshman and sophomore years.

Transfer Students

Because of the technical and professional nature of the college's curricula, the college reserves the right to determine whether courses taken at another institution satisfy the college's curricular requirements. In general, equivalent college-level courses successfully completed at an accredited college or university are accepted. OSU students requesting a transfer to the College of Agricultural Sciences' Department of Fisheries and Wildlife must be a student in good academic standing at the university. Please contact the departmental head advisor at 541-737-1941 for additional information.

Graduate Program

Graduate programs leading to the PSM, MS, or PhD (and participation in the MAIS degree program) permit intensive study in special areas of interest under the guidance of nationally known scientists. Advanced study in fisheries science may be pursued in stream ecology, aquaculture, population dynamics in response to exploitation, ecology of marine and freshwater fishes, taxonomy and systematics, genetics, toxicology, and parasites and diseases of fish. Advanced study in wildlife science can involve almost any invertebrate or vertebrate species, biotic community or habitat. Research emphasis may be placed on population dynamics and utilization, life history and ecology, conservation biology, habitats, nutrition, physiology, behavior, and organization of animal communities. Opportunities exist for work in terrestrial, marine and aquatic systems.

Undergraduate Programs

Major
- Fisheries and Wildlife Sciences (p. 148)

MinorS
- Fisheries and Wildlife Sciences (p. 147)
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Graduate Programs

Majors
- Fisheries and Wildlife Administration (p. 146)
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Minors
- Fisheries Science (p. 153)
- Wildlife Science (p. 154)

Certificates
- Fisheries Management (p. 152)
- Wildlife Management (p. 153)

Selina Heppell, Department Head
104C Nash Hall
Oregon State University
Corvallis, OR 97331-3803
Phone: 541-737-4531
Email: selina.heppell@oregonstate.edu
Website: http://fw.oregonstate.edu/

Bruce Dugger, Associate Department Head of Academic Affairs
166 Nash Hall
Oregon State University
Corvallis, OR 97331-3803
Phone: 541-737-2465
Email: bruce.dugger@oregonstate.edu

Faculty

Emeritus Coblentz, Gregory, Hall, Horton, Kennedy, Markle, Mate
Professors Baker, Banks, Bartholomew, Brandt, B. Dugger, Edge, Se. Heppell, Langdon, Miller, Noakes, Robinson, Sampson
Professors, Senior Research: Egna, Kauffman
Associate Professors, Senior Research: Hagen, Palacios
Assistant Professors Armstrong, Arismendi, Biedenweg, Hutchinson, Torres, White
Assistant Professors, Senior Research: Ellsworth, Janousek, Orben
Assistant Professor or Practice: Gladics
Senior Instructors Duplax, Hanschumaker, Moore, Painter, Paoletti, Reese, Shinderman
Instructors Albertson, Allen, Arbuckle, Campbell, Cheung, Diebel, Donaghy-Cannon, S. Dunham, Finley, Jarkowsky, Kelly, Konstantinidis

TOX 455  ECOTOXICOLOGY: AQUATIC ECOSYSTEMS
TOX 490  ENVIRONMENTAL FORENSIC CHEMISTRY

Total Hours  28-30

Minor Code: 618
FW 107. ORIENTATION TO FISHERIES AND WILDLIFE. (1 Credit)
Information relevant to academic pathways and career planning in the fields of fisheries and wildlife. Graded P/N.

FW 112. SCIENCE OF FLY FISHING TROUT. (1 Credit)
Uses fly fishing as a window into the larger world of science, art, and conservation, and more specifically into the structure and function of freshwater ecosystems. This class requires students to be concurrently registered for The Literature of Fly Fishing for Trout through English (ENG 225), and the Art of Fly Fishing through Physical Activity Courses (PAC 331).
Corequisites: ENG 225, PAC 331

FW 113. INTRODUCTION TO MARINE LIFE IN THE SEA-MARINE BIRDS AND MAMMALS. (1 Credit)
Introduces first- and second-year undergraduates, teachers and non-degree students to the breadth of marine science course offerings and research at Oregon State University’s Hatfield Marine Science Center located in Newport, Oregon. Using an experiential based format, students collect field data to better understand marine mammals (whales, dolphins and porpoises), seabirds, and their interactions with their environment. Lec/lab. Graded P/N.

FW 199. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Equivalent to: FW 199H
This course is repeatable for 16 credits.

FW 199H. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: FW 199
This course is repeatable for 16 credits.

FW 209. CAREER SKILLS IN FISHERIES AND WILDLIFE SCIENCES. (1 Credit)
A foundation for life-long career development in fisheries and wildlife sciences. Practice the skills needed to search, apply, and attain internships and jobs. Graded P/N.
Prerequisites: FW 107 with P or better

FW 230X. HUMANS AND THE OCEAN. (3 Credits)
An introduction to marine science and the history of humans’ interaction with the ocean. Lectures, group and individual library research, fieldtrips, and assignments will collate approaches from marine science, history, literary study, and other scientific and humanistic disciplines to introduce course material. Topics include oceanographic exploration, fishing and overfishing, and marine pollution. CROSSLISTED as ENG 230X/FW 230X/TOX 230X.
Equivalent to: ENG 230X, TOX 230X

FW 251. PRINCIPLES OF FISH AND WILDLIFE CONSERVATION. (3 Credits)
History of conservation and natural resource use; ecological principles, and social and economic limitations of conservation; principles and practices of wildlife and fisheries management; role of research in management.
Recommended: One course in introductory biology

FW 255. FIELD SAMPLING OF FISH AND WILDLIFE. (3 Credits)
Introduction to sampling populations and communities of vertebrate animals emphasizing sampling design, collection and management of data, and communication of results.
Recommended: WR 121 and familiarity with personal computers.

FW 289. COMMUNICATION SKILLS FOR FISHERIES AND WILDLIFE PROFESSIONALS. (4 Credits)
Introduces students to the theoretical and practical dimensions of interpersonal and public communication in a natural resource management field. Lec/rec.
Recommended: FW 251

FW 301. FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION. (1 Credit)
A laboratory and hands-on experience covering field techniques, computer software for data organization and analyses, and understanding the practical management conservation application for students who are taking or have taken FW/Bi 302, Biology and Conservation of Marine Mammals. Taught summer term at HMSC, Newport, OR.
Prerequisites: BI 302 (may be taken concurrently) with D- or better or FW 302 (may be taken concurrently) with D- or better

FW 302. BIOLOGY AND CONSERVATION OF MARINE MAMMALS. (4 Credits)
An examination of the biology of whales, pinnipeds, and other marine mammals, including general adaptations to a marine existence; systematics and biogeography; reproduction; diving physiology; communication and echolocation; feeding and migratory behavior; and marine mammal/human interactions; including conservation issues. Taught at Hatfield Marine Science Center OR online through Ecampus.
Equivalent to: BI 302
Recommended: One year of introductory biology

FW 303. SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE. (3 Credits)
Concepts underlying geographic information systems, global positioning system, and remote sensing; application to management and research, data quality issues, and case studies. Not a lab/skills class.
Students will examine career alternatives, develop career goals, learn what knowledge, skills, and abilities are important for diverse careers in fisheries and wildlife conservation, and develop an academic and lifelong plan for achieving their career goals. This course is intended to assist students in developing a specialization in fisheries and wildlife sciences. Graded P/N.

Equivalent to: FW 207
Recommended: FW 209

FW 311. ORNITHOLOGY. (3 Credits)
Survey of the adaptations of birds to a diverse array of habitats. Topics include origins, anatomy, reproductive strategies, migration, flight, behavior, physiology, nutrition, and conservation.

Recommended: One year introductory biology.

FW 312. SYSTEMATICS OF BIRDS. (2 Credits)
External anatomy, classification of birds of the world, and field identification of birds by sight and song. Field trips required.

Recommended: One year introductory biology.

FW 315. ICHTHYOLOGY. (3 Credits)
A survey of the diversity of biological adaptations of fishes. Topics include physiological and zoogeographical adaptations, reproduction, evolution, cladogenesis, morphology, behavior, and genetics.

Equivalent to: FW 313

Recommended: One year introductory biology.

FW 316. SYSTEMATICS OF FISHES. (3 Credits)
Phylogenetic diversity, evolution, relationships and identification of the world’s fishes, with particular focus on Oregon fishes. Includes identification, anatomy, use of keys, introduction to the comparative method, systematic theory, taxonomy, field collection and specimen curation. Lec/lab.

Prerequisites: (BI 211 with D- or better or BI 211H with D- or better or BI 204 with D- or better) and (BI 212 [D-] or BI 212H [D-] or BI 205 [D-]) and (BI 213 [D-] or BI 213H [D-] or BI 206 [D-])

Recommended: FW 315

FW 317. MAMMALOGY. (3 Credits)
A survey of the origins, evolution, diversity, and adaptations of mammals to diverse environments. Topics include taxonomy, reproduction, sensory perception, herbivory, population cycles and behavior.

Recommended: One year introductory biology.

FW 318. SYSTEMATICS OF MAMMALS. (2 Credits)
A survey of the phylogenetic diversity of the mammals in Oregon from a habitat/community perspective. Identifying, using keys, and measuring specimens will be stressed.

Recommended: One year introductory biology.

FW 320. INTRODUCTORY POPULATION DYNAMICS. (4 Credits)
Principles and concepts of population dynamics related to fish and wildlife populations; methods of estimating abundance, mortality, sustainable harvest levels and extinction risk; hands-on introduction to models for population analysis. Lec/lab.

Prerequisites: BI 370 (may be taken concurrently) with D- or better or BI 370H (may be taken concurrently) with D- or better or BI 371 (may be taken concurrently) with D- or better

Recommended: Introductory statistics and mathematics equivalent to MTH 245 or higher

FW 321. APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY. (3 Credits)
Perspectives in community and ecosystem ecology, and their use in management of fisheries and wildlife resource systems.

Prerequisites: FW 320 (may be taken concurrently) with D- or better
FW 345. *GLOBAL CHANGE BIOLOGY. (3 Credits)
Global Change Biology is the study of the impact of climate change on natural systems and actions to mitigate (slow) or adapt to climate change. Global climate change is having dramatic effects on natural resources including fish and wildlife populations and their habitats. Students will gain an understanding of the role that natural ecosystems (oceans, forests, wetlands, grasslands etc.) play in regulating the climate; how land use affects the earth’s climate; how climate change will affect fish, wildlife and their habitats; and the role that managers and researchers can play in mitigating and adapting to climate change. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: Introductory biology and ecology courses such as BI 370

FW 350. *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY. (3 Credits)
Provides a general background to endangered species biology, and the social and economic implications of the legislation enacted to conserve endangered species (Endangered Species Act, CITES Treaty). (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: FW 251

FW 356. *CITIZEN SCIENCE. (3 Credits)
Citizen science involves non-specialists in scientific studies addressing large challenges best solved through collaboration. Citizens contribute data scientists may not otherwise be able to obtain, while improving their understanding of the scientific process, integrating technology into the learning process, and generating new knowledge for society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

FW 360. *ORIGINS OF F&W MANAGEMENT-EVOLUTION, GENETICS, AND ECOLOGY. (3 Credits)
Examines genetics and human interactions with fisheries and wildlife from an ecological and evolutionary perspective. Basic principles of environmental interactions, and how humans interact with other species and their environments in the disciplines commonly recognized as fisheries, wildlife and conservation sciences. (Baccalaureate Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Two terms of coursework at OSU

FW 366. ENVIRONMENTAL CONTAMINANTS IN FISH AND WILDLIFE. (3 Credits)
Environmental contamination is an important threat to many fish and wildlife populations and the habitats and prey upon which they rely. The field of ecotoxicology links the ecology of fish and wildlife with toxicology of environmental contaminants, and so spans political, scientific, and public relations realms. Through the pairing of introductory concepts with key case studies, this course provides students with a preparatory framework for understanding toxicological issues of importance for those focused on studying, managing or conserving fish and wildlife populations.
Prerequisites: (BI 204 with D- or better or BI 211 with D- or better or BI 211H with D- or better) and (BI 205 [D-] or BI 212 [D-] or BI 212H [D-])

FW 370. CONSERVATION GENETICS. (4 Credits)
A foundational course in preparation for a degree in Fisheries and Wildlife or other degrees focused on conservation of natural resources. Covers a broad range of topics associated with issues surrounding genetics that working professionals in the biological sciences should be conversant about. One of the most important aspects of the course is the development of problem-solving and critical-thinking skills.
Prerequisites: (BI 211 with D- or better or BI 204 with D- or better) and (BI 212 [D-] or BI 205 [D-]) and (BI 213 [D-] or BI 206 [D-])
Recommended: One year introductory biology

FW 391. *RIDGE TO REEF: SUSTAINABLE RESOURCE MANAGEMENT IN PALAU. (4 Credits)
How do small islands address issues of natural resource management, food security, and sustainability? What role do communities, governments, and non-profits play in addressing these issues? Can traditional ecological knowledge help solve these challenges? What about climate change on small Islands? The Republic of Palau will be our classroom. Students will work with and learn from fishers, farmers, community leaders, traditional chiefs, terrestrial and marine biologists, and policy makers. Key topics include food security/production, climate change adaptation, protected area management, biocultural conservation, sustainable forest management, watershed management, sustainable development, coral reef and fisheries management, biodiversity measurement methods and ecosystem restoration.
Attributes: CSGI – Core, Synth, Global Issues

FW 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FW 403. THESIS. (1-16 Credits)
This course is repeatable for 32 credits.

FW 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FW 407. SEMINAR. (1-16 Credits)
Graded P/N. Taught at Hatfield Marine Science Center.
Equivalent to: FW 407H
This course is repeatable for 16 credits.

FW 407H. SEMINAR. (1-16 Credits)
Graded P/N. Taught at Hatfield Marine Science Center.
Attributes: HNRS – Honors Course Designator
Equivalent to: FW 407
This course is repeatable for 16 credits.

FW 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

FW 410. INTERNSHIP. (1-6 Credits)
This course is repeatable for 99 credits.

FW 415. FISHERIES AND WILDLIFE LAW AND POLICY. (3 Credits)
Provides students with an understanding of the key legal frameworks within which they will work to conserve fish and wildlife resources. Examines federal law and policy relating to allocation and conservation of fish and wildlife resources.
Recommended: PS 201 or other introductory political science course.

FW 418. URBAN ECOLOGY. (3 Credits)
Understand how an increasing human population increases pressure on fish and wildlife communities and resources within ecosystems. Examines the interactions between humans and animal species within urban areas and the effects of urbanization on species, communities, and ecosystems. Topics include conserving biodiversity, invasive species, human health and well-being, and urban planning.
Recommended: FW 255, BI 370
FW 419. THE NATURAL HISTORY OF WHALES AND WHALING. (3 Credits)
Addresses the natural history of whales as a unique example of adaptation in an evolutionary lineage, and the history of whaling as a general example of the failings of international resource management. **Recommended:** Some background in vertebrate ecology and evolution or genetics.

FW 421. AQUATIC BIOLOGICAL INVASIONS. (4 Credits)
An overview of the background, theory, evolution, ecology, politics and conservation of invasions by introduced species in aquatic environments. Taught at Hatfield Marine Science Center OR online through Ecampus. **Equivalent to:** BI 421
**Recommended:** One year of university-level biology.

FW 422. INTRODUCTION TO OCEAN LAW. (3 Credits)
Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.

FW 426. COASTAL ECOLOGY AND RESOURCE MANAGEMENT. (5 Credits)
Study of the ecology and management of coastal marine and freshwater ecosystems as well as natural resources, emphasizing experimental (participatory) learning in a field station setting. **Lec/lab.**

FW 427. PRINCIPLES OF WILDLIFE DISEASES. (4 Credits)
Ecological aspects of important diseases affecting North American wildlife will be discussed. Demonstrations will mainly cover migratory birds, carnivores and ruminants. **Lec/lab. Ecampus sections do not use lab demonstrations.**

FW 433. POPULATION DYNAMICS FOR CONSERVATION. (4 Credits)
A synthesis of the principles of population dynamics from the viewpoint of a resource manager. Particular attention is paid to populations structured by age, size, or over space, and considering both fisheries and wildlife management. Laboratory work uses computer programming in the R language to implement examples from lecture. **Prerequisites:** (FW 320 with C or better or BI 483 with C or better) and (FW 327 with C or better or MTH 228 with C or better) or (MTH 251 with C or better or MTH 252 with C or better)

FW 434. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required; transportation fee charged. **CROSSLISTED as FW 434/OC 434 and FW 534/OC 534.**

FW 435. *WILDLIFE IN AGRICULTURAL ECOSYSTEMS. (3 Credits)
Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips. (Writing Intensive Course) **Attributes:** CWIC – Core, Skills, WIC
**Recommended:** BI 370 and FW 251

FW 439. *HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT. (3 Credits)
Students build an understanding and appreciation for the role of human dimensions (HD) in fisheries and wildlife management. Students work both independently and in groups on assignments with an HD focus. (Writing Intensive Course) **Attributes:** CWIC – Core, Skills, WIC
**Equivalent to:** FES 439
**Recommended:** Principles of fish and wildlife conservation or natural resources and introductory statistics.

FW 445. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. **CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.**

FW 446. COASTAL ECOLOGY AND CONSERVATION. (5 Credits)
A thorough understanding of the management, conservation, and ecology of coastal marine and freshwater environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required; transportation fee charged. **CROSSLISTED as FW 446/FES 446 and FES 546/FW 546.**

FW 452. BIODIVERSITY CONSERVATION IN MANAGED FORESTS. (3 Credits)
Designed for students in forestry, wildlife, fisheries and related fields. Introduces the concepts of, and approaches to, managing forest stands, landscapes and regions to achieve desired habitat conditions for indicator species and conservation of biological diversity. **CROSSLISTED as FES 452/FW 452.**

FW 454. *FISHERY BIOLOGY. (4 Credits)
Principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management. (Writing Intensive Course) **Attributes:** CWIC – Core, Skills, WIC
**Prerequisites:** FW 315 with D- or better and FW 320 [D-]

FW 456. FRESHWATER ECOLOGY AND CONSERVATION. (5 Credits)
Physical, chemical, biological, and environmental concepts in continental aquatic systems. Includes techniques related to assessing aquatic resources their management and conservation. **Lec/lab.**

FW 458. MAMMAL CONSERVATION AND MANAGEMENT. (4 Credits)
A synthesis of the principles of population dynamics from the viewpoint of a resource manager. Particular attention is paid to populations structured by age, size, or over space, and considering both fisheries and wildlife management. Laboratory work uses computer programming in the R language to implement examples from lecture. **Prerequisites:** (FW 320 with C or better or BI 483 with C or better) and (FW 327 with C or better or MTH 228 with C or better) or (MTH 251 with C or better or MTH 252 with C or better)

FW 459. *HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT. (3 Credits)
Students build an understanding and appreciation for the role of human dimensions (HD) in fisheries and wildlife management. Students work both independently and in groups on assignments with an HD focus. (Writing Intensive Course) **Attributes:** CWIC – Core, Skills, WIC
**Equivalent to:** FES 439
**Recommended:** Principles of fish and wildlife conservation or natural resources and introductory statistics.

FW 465. INTRODUCTION TO OCEAN LAW. (3 Credits)
Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.

FW 466. COASTAL ECOLOGY AND CONSERVATION. (5 Credits)
A thorough understanding of the management, conservation, and ecology of coastal marine and freshwater environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required; transportation fee charged. **CROSSLISTED as FW 446/FES 446 and FES 546/FW 546.**

FW 467. PRINCIPLES OF WILDLIFE DISEASES. (4 Credits)
Ecological aspects of important diseases affecting North American wildlife will be discussed. Demonstrations will mainly cover migratory birds, carnivores and ruminants. **Lec/lab. Ecampus sections do not use lab demonstrations.**

FW 468. POPULATION DYNAMICS FOR CONSERVATION. (4 Credits)
A synthesis of the principles of population dynamics from the viewpoint of a resource manager. Particular attention is paid to populations structured by age, size, or over space, and considering both fisheries and wildlife management. Laboratory work uses computer programming in the R language to implement examples from lecture. **Prerequisites:** (FW 320 with C or better or BI 483 with C or better) and (FW 327 with C or better or MTH 228 with C or better) or (MTH 251 with C or better or MTH 252 with C or better)

FW 469. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required; transportation fee charged. **CROSSLISTED as FW 434/OC 434 and FW 534/OC 534.**

FW 470. WILDLIFE IN AGRICULTURAL ECOSYSTEMS. (3 Credits)
Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips. (Writing Intensive Course) **Attributes:** CWIC – Core, Skills, WIC
**Recommended:** BI 370 and FW 251
FW 462. ECOSYSTEM SERVICES. (3 Credits)
Introduces students to the ecological, economic, and social/ethical issues involved in the study of ecosystem services, with a major focus on biological components involved in ecosystem services. Topics covered include: 1) an introduction to the roles that living organisms play in the provision of ecosystem services, 2) the relationship of ecosystem functions and services, 3) the societal factors that influence this relationship, 4) general categories of ecosystem services, 5) identification of potential ecosystem services in terrestrial and aquatic systems, 6) an overview of the methods of valuation, and 7) translating ecosystems functions to services. Case studies will be used to illustrate key concepts and relationships within different ecological and social contexts.
Recommended: BI 370

FW 464. MARINE CONSERVATION BIOLOGY. (3 Credits)
Lectures, group library research, and class debates on current issues regarding the conservation of biodiversity in the sea. Topics include overfishing, invasive species, eutrophication, marine pollution, and global warming, as well as means of addressing these threats.
Prerequisites: BI 370 with D- or better or BI 370H with D- or better
Equivalent to: BI 464

FW 465. MARINE FISHERIES. (4 Credits)
A global perspective on commercial fish and shellfish harvesting with emphasis on fishing technology and policy issues. Offered fall term in odd years.
Recommended: FW 315

FW 467. ANTARCTIC SCIENCE AND CONSERVATION. (4 Credits)
Explores the history, geology, climate, and ecosystems of Antarctica, with an emphasis on current research and conservation issues. Focuses on critical thinking skills developed through independent research on a topic of interest, an internal peer review project, and discussions of relevant case studies in Antarctic research.

FW 469. METHODS IN PHYSIOLOGY AND BEHAVIOR OF MARINE MEGAFUNA. (3 Credits)
An in-depth study of marine megafauna (mammals, birds, turtles) with an emphasis on methods and analyses of behavior and physiology for conservation. Lab and field exercises include investigations into the behavior–physiology nexus of diving, migration, thermoregulation, energy expenditure, and mating systems. Research techniques to be explored will include, for example, tracking and remote biotelemetry monitoring technologies, respirometry, genetics, and direct field study observation. Theoretical approaches, field techniques and statistical analyses will help prepare students for a career in fisheries or wildlife science. Lec/lab. Taught at HMSC.
Recommended: One year of introductory biology and nine credits of upper-division FW or BI courses

FW 470. *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN. (3 Credits)
Integrates environmental history and landscape ecology of the Columbia River Basin from geologic origins to the present, to create an understanding of change caused by natural processes and human activities. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: HSTS 470
Recommended: (HST 201 and HST 202 and HST 203) or BI 370

FW 471. ENVIRONMENTAL PHYSIOLOGY OF FISHES. (4 Credits)
Principles of the functional biology of fishes with emphasis on environmental interactions and management implications.
Recommended: FW 315 and (BI 370 or BI 371)

FW 473. FISH ECOLOGY. (4 Credits)
Behavior of fishes as a mode of accommodation to various ecological and evolutionary constraints. Importance of heritable and learned patterns to population and community dynamics. Application of behavioral studies to the solution of management problems. Lec/lab/rec.
Prerequisites: (BI 370 with D- or better or BI 370H with D- or better) and FW 315 [D-]

FW 474. EARLY LIFE HISTORY OF FISHES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years.
Recommended: FW 315

FW 475. WILDLIFE BEHAVIOR. (4 Credits)
Recommended: 9 credits of upper-division biology.

FW 476. FISH PHYSIOLOGY. (4 Credits)
Physiological specializations and adaptations of major groups of fishes.
Prerequisites: FW 315 with D- or better

FW 477. AGE AND GROWTH OF FISH. (3 Credits)
An overview of the terminology, theory, assumptions, limitations, error, and processing and ageing techniques for different types of calcified structures used to age fishes.
Prerequisites: FW 454 with D- or better
Recommended: Introductory statistics

FW 479. WETLANDS AND RIPARIAN ECOLOGY. (3 Credits)
Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Recommended: BI 370 or BI 371

FW 481. WILDLIFE ECOLOGY. (3 Credits)
Interrelationships of wildlife, environmental change. Predicting and measuring responses of wildlife to altered habitat conditions.
Prerequisites: BI 370 with D- or better or BI 370H with D- or better or BI 371 with D- or better

FW 488. PROBLEM SOLVING IN FISHERIES AND WILDLIFE SCIENCE. (3 Credits)
A capstone course designed to introduce students to the synthesis of scientific information on species, habitats and ecosystems and the use of such data in shaping fisheries and wildlife conservation, management and policy. Includes a group problem-solving project and case studies. For FW majors in their senior year.
Prerequisites: FW 320 with D- or better and FW 321 (may be taken concurrently) [D-]
Recommended: 400-level FW course work (e.g., FW 426 or FW 454 or FW 481)

FW 489. EFFECTIVE COMMUNICATIONS IN FISHERIES AND WILDLIFE SCIENCE. (3 Credits)
Centers on the synthesis and interpretation of data and effective communication of that information in written and oral communication to diverse audiences including scientists, managers, administrators and the general public.
FW 491. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: MB 491
Recommended: 9 credits of upper-division fisheries biology.

FW 493. FIELD METHODS FOR MARINE RESEARCH. (3 Credits)
The primary focus is providing hands-on experience in a small class exploring various field sampling methodologies, research planning logistics, and field operations in estuary and nearshore environments. Topics covered include measurement and collection methods, animal handling techniques, equipment care and handling, sampling strategy, experimental design, data management planning and, if possible, small boat work.
Recommended: One year of biology

FW 496. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSLISTED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: MB 496
Recommended: MB 303 or other upper-division laboratory course.

FW 497. AQUACULTURE. (3 Credits)
Principles and practices for the aquaculture of fish, shellfish, and algae. (Writing Intensive Course.)
Attributes: CWIC – Core, Skills, WIC
Recommended: 9 credits of upper-division biology.

FW 498. AQUACULTURE LABORATORY. (3 Credits)
Biology and culture requirements of fish, shellfish, and algae. Emphasis on laboratory culture techniques and practical experience in handling organisms. Taught at Hatfield Marine Science Center.
Recommended: 9 credits of upper-division biology.

FW 499. SPECIAL TOPICS IN FISHERIES AND WILDLIFE. (0-16 Credits)
Various topics in fisheries science and wildlife science. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: ENT 499
This course is repeatable for 16 credits.

FW 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FW 502. TEACHING METHODS IN FISHERIES AND WILDLIFE. (1 Credit)
This is a discussion course designed to help new GTAs and instructors who are learning the trials and tribulations of university-level teaching in our department. This is a great course for students who are interested in hearing more about teaching approaches, grading and assessment, student communication, problem students, and development of teaching Graded P/N.

FW 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FW 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FW 506. PROJECTS. (1-6 Credits)
Projects are synthesis papers or outreach products that are developed with a mentor from campus, a natural resource agency, or the student's place of employment. The purpose of your project is to contribute to the field of study with a product that reflects the principles and applications learned in your classes.
This course is repeatable for 12 credits.

FW 507. SEMINAR. (1-16 Credits)
Selected Topics. Taught at Hatfield Marine Science Center and Corvallis campus.
This course is repeatable for 16 credits.

FW 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

FW 510. PROFESSIONAL INTERNSHIP. (1-16 Credits)
This course is repeatable for 10 credits.

FW 514. PROFESSIONAL DEVELOPMENT: MEETING COMMUNICATIONS. (1 Credit)
Fisheries and wildlife professionals use meetings of scientists, managers and stakeholders to communicate key findings and develop consensus recommendations for policy. This 1-credit experiential learning course will expose students to a scientific or management meeting in their chosen field (fisheries, wildlife, ecology, or conservation biology) and get them to think about how meetings function as well as their content.
This course is repeatable for 3 credits.

FW 515. FISHERIES AND WILDLIFE LAW AND POLICY. (3 Credits)
Provides students with an understanding of the key legal frameworks within which they will work to conserve fish and wildlife resources. Examines federal law and policy relating to allocation and conservation of fish and wildlife resources.
Recommended: PS 201 or other introductory political science course.

FW 518. URBAN ECOLOGY. (3 Credits)
Understand how an increasing human population increases pressure on fish and wildlife communities and resources within ecosystems. Examines the interactions between humans and animal species within urban areas and the effects of urbanization on species, communities, and ecosystems. Topics include conserving biodiversity, invasive species, human health and well-being, and urban planning.

FW 519. THE NATURAL HISTORY OF WHALES AND WHALING. (3 Credits)
Addresses the natural history of whales as a unique example of adaptation in an evolutionary lineage, and the history of whaling as a general example of the failings of international resource management.
Recommended: Some background in vertebrate ecology and evolution or genetics

FW 521. AQUATIC BIOLOGICAL INVASIONS. (4 Credits)
An overview of the background, theory, evolution, ecology, politics and conservation of invasions by introduced species in aquatic environments. Taught at Hatfield Marine Science Center OR online through Ecampus.
Recommended: One year of university-level biology.

FW 522. INTRODUCTION TO OCEAN LAW. (3 Credits)
Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.
FW 523. MONITORING WILDLIFE POPULATIONS AND THEIR HABITATS. (3 Credits)
An overview of monitoring plan design and the conceptual background needed to understand and critique monitoring plans, and have the basic skills to develop and implement a monitoring program as part of an interdisciplinary team.
Recommended: Introductory course in statistics and introductory course in ecology.

FW 524. INTRODUCTION TO FISHERIES ASSESSMENT. (3 Credits)
Fisheries management strategies rely on models that predict a population's responses to exploitation. This course introduces approaches commonly used to assess and evaluate the dynamics and status of a population. Provides an overview of the terminology, data requirements, underlying rationale, assumptions, limitations and uncertainty associated with stock assessments.
Recommended: College algebra, introductory statistics and, if unfamiliar with data collection and analysis methods in fisheries, FW 454/554.

FW 526. COASTAL ECOLOGY AND RESOURCE MANAGEMENT. (5 Credits)
Study of the ecology and management of coastal marine and freshwater ecosystems as well as natural resources, emphasizing experimental (participatory) learning in a field station setting. Lec/lab.

FW 527. PRINCIPLES OF WILDLIFE DISEASES. (4 Credits)
Ecological aspects of important diseases affecting North American wildlife will be discussed. Demonstrations will mainly cover migratory birds, carnivores and ruminants. Lec/lab. Ecampus sections do not use lab demonstrations.

FW 528. DIVERSITY AND IDENTIFICATION OF LARVAL FISHES. (3 Credits)
Research on early life history stages of fishes has increased considerably in recent years, due to its importance in many research fields, such as fisheries science and oceanography, species conservation, systematics and morphology. Simultaneously, the ability to identify ichthyoplankton has decreased. This course is intended to provide students with an understanding of the evolutionary diversity of ichthyoplankton of the world.
Recommended: A completed 300-level systematics of fishes, ichthyology or comparative anatomy course.

FW 529. ICHTHYOPLANKTON IDENTIFICATION LABORATORY. (2 Credits)
Larval fishes are important in many research fields, and are part of many natural history collections. However, often museums are unable to provide the curatorial needs due to the lack of trained personnel. The lab will provide students with the necessary practical skills to identify larval fishes. Distinctive from the course 528, where students learn about the diversity and evolution of larval fish characters, the laboratory is designed to the identification of larvae from a real collection. Students are encouraged to bring unidentified ichthyoplankton samples or mixed species lots to the course to help with their identification.

FW 533. POPULATION DYNAMICS FOR CONSERVATION. (4 Credits)
A synthesis of the principles of population dynamics from the viewpoint of a resource manager. Particular attention is paid to populations structured by age, size, or over space, and considering both fisheries and wildlife management. Laboratory work uses computer programming in the R language to implement examples from lecture.
Prerequisites: IB 592 with C or better
Recommended: (MTH 227 and MTH 228) or (MTH 251 and MTH 252)

FW 534. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. CROSSLISTED as FW 434/OC 434 and FW 534/OC 534.
Equivalent to: OC 534

FW 535. WILDLIFE IN AGRICULTURAL ECOSYSTEMS. (3 Credits)
Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips.
Recommended: One year of college-level mathematics and one quarter of fish and wildlife management

FW 537. STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT. (2 Credits)
Structured decision making (SDM) is used for making natural resource management and policy decisions. It is an ideal framework for interdisciplinary teams to cooperate and identify the most effective management strategies. Graduate students from diverse backgrounds (natural resources, political science, others) are provided with an understanding of the SDM process.
Recommended: One year of college-level mathematics and one quarter of fish and wildlife management

FW 538. STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT LAB. (2 Credits)
Students who are taking or have taken FW 537 are provided with the understanding of and ability to employ the techniques needed to build models that are used during the structured decision-making process. The laboratory emphasizes the use of graphical models and basic statistical techniques for building decision-making models. Lec/lab.
Prerequisites: FW 537 (may be taken concurrently) with D- or better

FW 540. VERTEBRATE POPULATION DYNAMICS. (4 Credits)
Concepts in population ecology and quantitative approaches to managing wildlife populations; methods of parameter estimation, model structure, assumptions, and analysis, applications to common management issues.
Recommended: Upper-division population ecology and basic statistics courses

FW 544. QUANTITATIVE DECISION ANALYSIS FOR FISH AND WILDLIFE MANAGEMENT. (4 Credits)
Decision analysis allows decision makers to examine the expected effects of different strategies before implementation; incorporate multiple objectives and values of stakeholders; determine the relative influence of various sources of uncertainty; and estimate the value of collecting additional data. Quantitatively oriented graduate students in natural resources are provided with an in-depth overview of decision analysis and adaptive management, emphasizing animal population management.
Lec/lab.
Recommended: ST 511 and ST 512 or equivalent, basic background in animal population dynamics and management.
FW 545. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FES 545, FOR 545
Recommended: BI 370 or BI 370H

FW 549. HISTORY OF FISHERIES SCIENCE. (3 Credits)
Surveys the development of fisheries science, professionalization of the discipline, patronage, and the political, economic, and social context in which fisheries science operates.

FW 550. TROPHIC CASCADES. (2-3 Credits)
Theory and empirical analysis of terrestrial carnivore effects on plants and ecosystems as mediated through herbivores. Emphasis on large carnivores, frequency/ strength of trophic cascades, implications for ecosystem function, management, and restoration. Lectures, current literature, discussions, field exercise, term paper, and student presentations. CROSSLISTED as FES 550/FW 550.
Equivalent to: FES 550, FOR 547, FW 547
This course is repeatable for 3 credits.

FW 551. AVIAN CONSERVATION AND MANAGEMENT. (3 Credits)
Identification, classification, life history strategies, ecology and management of upland and migratory birds.
Recommended: FW 311 or equivalent course work.

FW 552. FOREST WILDLIFE HABITAT MANAGEMENT. (4 Credits)
Management of terrestrial vertebrates in forest ecosystems. Effects on silvicultural practices and landscape pattern on habitats and populations. CROSSLISTED as FES 552/FW 552.
Equivalent to: FES 552
Recommended: FOR 341 or equivalent course in ecology.

FW 554. FISHERY BIOLOGY. (4 Credits)
Principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management.
Recommended: FW 315 and FW 320

FW 556. FRESHWATER ECOLOGY AND CONSERVATION. (5 Credits)
Physical, chemical, biological, and environmental concepts in continental aquatic systems. Includes techniques related to assessing aquatic resources their management and conservation. Lec/lab.
Recommended: BI 370 or BI 371 or 9 credits of upper-division biological sciences

FW 558. MAMMAL CONSERVATION AND MANAGEMENT. (4 Credits)
A thorough understanding of the management, conservation, and ecology of mammals in North America, includes population dynamics, harvest management, techniques to determine abundance, diets, reproduction, and the cultural and political variables that contribute to formulation of management programs.
Recommended: 9 credits of upper-division biological sciences.

FW 560. PSYCHOLOGY OF ENVIRONMENTAL DECISIONS. (3 Credits)
Natural resource management and conservation programs have one thing in common: to be effective, they must consider how and why humans make decisions. This course approaches this topic from a psychological lens and will cover the psychological processes associated with making individual and group decisions, common biases and heuristics in our decision-making, and how these apply to diverse natural resource management and conservation issues. Students will learn how to take these aspects of human decision making into consideration when participating in or facilitating collaborative environmental programs.

FW 561. BEHAVIOR AND PHYSIOLOGY OF HUMANS. (3 Credits)
An in-depth study of human behavior and physiology with an emphasis on methods and analyses of behavior and physiology for conservation. Lab and field exercises include investigations into the behavior—physiology nexus of diving, migration, thermoregulation, energy expenditure, and mating systems. Research techniques to be explored will include, for example, tracking and remote biotelemetry monitoring technologies, respirometry, genetics, and direct field study observation. Theoretical approaches, field techniques and statistical analyses will help prepare students for a career in fisheries or wildlife science. Lec/lab. Taught at HMSC.
Recommended: One year of introductory biology and nine credits of upper-division courses in Fisheries and Wildlife or biological sciences in their undergraduate program.
FW 570. ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN. (3 Credits)
Integrates environmental history and landscape ecology of the Columbia River Basin from geologic origins to the present, to create an understanding of change caused by natural processes and human activities.
Equivalent to: HSTS 570
Recommended: (HST 201 and HST 202 and HST 203) or BI 370

FW 571. ENVIRONMENTAL PHYSIOLOGY OF FISHES. (4 Credits)
Principles of the functional biology of fishes with emphasis on environmental interactions and management implications.
Recommended: FW 315 and (BI 370 or BI 371)

FW 573. FISH ECOLOGY AND CONSERVATION. (4 Credits)
Behavior of fishes as a mode of accommodation to various ecological and evolutionary constraints. Importance of heritable and learned patterns to population and community dynamics. Application of behavioral studies to the solution of management problems.
Recommended: BI 370 and FW 315

FW 574. EARLY LIFE HISTORY OF FISHES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years.
CROSSLISTED as FW 574/OC 574.
Equivalent to: OC 574
Recommended: FW 315

FW 575. WILDLIFE BEHAVIOR. (4 Credits)
Equivalent to: FW 585
Recommended: 9 credits of upper-division biology.

FW 576. FISH PHYSIOLOGY. (4 Credits)
Physiological specializations and adaptations of major groups of fishes.
Recommended: FW 315

FW 579. WETLANDS AND RIPARIAN ECOLOGY. (3 Credits)
Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Recommended: BI 370 or BI 371

FW 580. STREAM ECOLOGY. (3 Credits)
Structure and function of stream ecosystems, with emphasis on biological processes; physical and chemical relations; riparian influences and landscape perspectives.
Recommended: 9 credits of upper-division science.

FW 581. WILDLIFE ECOLOGY. (3 Credits)
Interrelationships of wildlife, environment and humans. Evaluation of properties and habitats of wildlife populations.
Recommended: (BI 370 or BI 371) and FW 311 and FW 320 and ST 351

FW 583. SPECIES RECOVERY PLANNING AND RESTORATION. (3 Credits)
The importance of recovery in science is stressed and a broad knowledge of endangered species-related information is provided. Students develop the ability to critically evaluate published information in scientific literature and to present and summarize it as part of the collaborative species recovery planning process with a varied audience of stakeholders.
Recommended: FW 563 and FW 573

FW 591. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: MB 591
Recommended: 9 credits of upper-division fisheries biology.

FW 596. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods.
CROSSLISTED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: MB 596
Recommended: MB 303 or other upper-division laboratory course.

FW 597. AQUACULTURE. (3 Credits)
Principles and practices for the aquaculture of fish, shellfish, and algae.
Recommended: 9 credits of upper-division biology.

FW 598. AQUACULTURE LABORATORY. (3 Credits)
Biological and culture requirements of fish, shellfish, and algae. Emphasis on laboratory culture techniques and practical experience in handling organisms. Taught at Hatfield Marine Science Center.
Recommended: 9 credits of upper-division biology.

FW 599. SPECIAL TOPICS IN FISHERIES AND WILDLIFE. (0-16 Credits)
Various topics in fisheries science and wildlife science. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: ENT 499
This course is repeatable for 99 credits.

FW 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FW 603. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

FW 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FW 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FW 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FW 620. ECOLOGICAL POLICY. (3 Credits)
Policy issues associated with ecosystem management, risk assessment, biological diversity, ecosystem health, sustainability, invasive species, bioregionalism, globalization and transnational factors, and rights, ethics, and morals.
Recommended: Background in natural resources, environmental sciences, ecological sciences, ecological economics, political science, or similar discipline.

FW 661. ANALYSIS OF ANIMAL POPULATIONS. (5 Credits)
Quantitative methods for estimating parameters (abundance, survival, population stability) of animal populations. Emphasis is on vertebrate animals and statistical methods of hypothesis testing, parameter estimation, and inference testing. Offered odd-numbered years.
Recommended: ST 511 and ST 512 or equivalent

FW 699. SPECIAL TOPICS IN FISHERIES AND WILDLIFE. (1-4 Credits)
Various topics in fisheries science and wildlife science. Taught at Hatfield Marine Science Center and Corvallis campus.
This course is repeatable for 8 credits.
FW 808. WORKSHOP. (1-16 Credits)

Fisheries and Wildlife Administration Graduate Major (PSM)

Also available via Ecampus.

Dr. Bruce Dugger, Associate Department Head, Director of Online Graduate Programs
Dr. Susie Dunham, Graduate Program Coordinator
Email: fw.gradadvising@oregonstate.edu
Website: https://fw.oregonstate.edu/fisheries-and-wildlife/psm-fisheries-wildlife-administration

The Professional Science Master's degree in Fisheries and Wildlife Administration (PSMFWA) provides advanced training for early- and mid-career professionals. It is taught primarily as a distance, online curriculum via Ecampus, although students may choose to work toward the PSMFWA degree while in residence at OSU or at the Hatfield Marine Science Center.

The PSMFWA degree is offered as a non-thesis program only. Students have an advisor and graduate committee to review their program of study, provide career and internship advice, and evaluate a final report based on the internship experience or capstone project.

For additional information about the FW PSM degree email fw.gradadvising@oregonstate.edu

Major Code: 1331

The 45-credit PSMFWA curriculum is organized into five main sections:

1. Biophysical sciences core (20 credits)
2. Social sciences core (12 credits)
3. Business communication and management skills core (6 credits)
4. Ethics (1 credit)
5. Internship (6 credits)

Course substitutions must be approved by the program coordinator.

Most of our courses are offered through Ecampus, but some may be offered through Corvallis, Cascades or Hatfield Marine Science Center. Please check course offerings through the online catalog and schedule of classes or consult with the program advisor.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BOT 540</td>
<td>FIELD METHODS IN PLANT ECOLOGY</td>
<td>20</td>
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<tr>
<td>FES 535</td>
<td>GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
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<tr>
<td>or MCB 535</td>
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<td>or TOX 535</td>
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<tr>
<td>FES 536</td>
<td>CARBON SEQUESTRATION IN FORESTS</td>
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<td>FES 548</td>
<td>INVASIVE PLANTS: BIOLOGY, ECOLOGY AND MANAGEMENT</td>
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<td>FW 519</td>
<td>THE NATURAL HISTORY OF WHALES AND WHALING</td>
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<td>FW 521</td>
<td>AQUATIC BIOLOGICAL INVASIONS</td>
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<td>FW 526</td>
<td>COASTAL ECOLOGY AND RESOURCE MANAGEMENT (can count as FW Core or Human Dimensions)</td>
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<tr>
<td>FW 527</td>
<td>PRINCIPLES OF WILDLIFE DISEASES</td>
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<td>FW 535</td>
<td>WILDLIFE IN AGRICULTURAL ECOSYSTEMS</td>
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<td>FW 545</td>
<td>ECOLOGICAL RESTORATION</td>
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<td>or FES 545</td>
<td>ECOLOGICAL RESTORATION</td>
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<td>FW 551</td>
<td>AVIAN CONSERVATION AND MANAGEMENT</td>
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<td>FW 552</td>
<td>FOREST WILDLIFE HABITAT MANAGEMENT</td>
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<td>or FES 552</td>
<td>FOREST WILDLIFE HABITAT MANAGEMENT</td>
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<tr>
<td>FW 554</td>
<td>FISHERY BIOLOGY</td>
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<td>FW 556</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
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<td>FW 558</td>
<td>MAMMAL CONSERVATION AND MANAGEMENT</td>
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<td>FW 562</td>
<td>ECOSYSTEM SERVICES</td>
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<td>FW 563</td>
<td>CONSERVATION BIOLOGY OF WILDLIFE</td>
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<tr>
<td>FW 564</td>
<td>MARINE CONSERVATION BIOLOGY</td>
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<td>FW 565</td>
<td>MARINE FISHERIES</td>
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<tr>
<td>FW 570</td>
<td>ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN</td>
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<tr>
<td>FW 573</td>
<td>FISH ECOLOGY AND CONSERVATION</td>
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<td>FW 575</td>
<td>WILDLIFE BEHAVIOR</td>
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<td>FW 576</td>
<td>FISH PHYSIOLOGY</td>
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<td>FW 579</td>
<td>WETLANDS AND RIPARIAN ECOLOGY</td>
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<td>FW 580</td>
<td>STREAM ECOLOGY</td>
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<td>FW 581</td>
<td>WILDLIFE ECOLOGY</td>
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<tr>
<td>FW 597</td>
<td>AQUACULTURE</td>
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<tr>
<td>FW 599</td>
<td>SPECIAL TOPICS IN FISHERIES AND WILDLIFE</td>
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<tr>
<td>MNR 530</td>
<td>TROPICAL FOREST ECOLOGY AND MANAGEMENT: A GLOBAL PERSPECTIVE</td>
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<td>NSE 588</td>
<td>RADIOECOLOGY</td>
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<tr>
<td>SNR 530</td>
<td>ECOLOGICAL PRINCIPLES OF SUSTAINABLE NATURAL RESOURCES</td>
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<tr>
<td>SNR 540</td>
<td>GLOBAL ENVIRONMENTAL CHANGE</td>
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</table>

Qualitative Skills in FW Science

BEE 511 | GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS | |
| CH 584 | INSTRUMENTS AND ONLINE INTERACTIONS IN THE SCIENCES | |
| CH 590 | COMPUTER PROGRAMMING FOR SCIENTISTS | |
| FES 522 | RESEARCH METHODS SOCIAL SCIENCE | |
| or MNR 522 | RESEARCH METHODS SOCIAL SCIENCE | |
| FW 524 | INTRODUCTION TO FISHERIES ASSESSMENT | |
| FW 538 | STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT LAB | |
| FW 540 | VERTEBRATE POPULATION DYNAMICS | |
| GEOG 550 | LAND USE IN THE AMERICAN WEST | |
| PS 555 | THE POLITICS OF CLIMATE CHANGE | |

Social Sciences Core Courses

Required

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FW 537</td>
<td>STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT</td>
<td>2</td>
</tr>
<tr>
<td>FW 520</td>
<td>ECOCLOGICAL POLICY</td>
<td>3</td>
</tr>
<tr>
<td>or FW 515</td>
<td>FISHERIES AND WILDLIFE LAW AND POLICY</td>
<td></td>
</tr>
</tbody>
</table>

Select a minimum of 7 additional credits of the following with at least one from each group:

Policy Courses

AEC 532 | ENVIRONMENTAL LAW | |
| FES 555 | URBAN FOREST PLANNING, POLICY AND MANAGEMENT | |
| or HORT 555 | URBAN FOREST PLANNING, POLICY AND MANAGEMENT | |
| FW 522 | INTRODUCTION TO OCEAN LAW | |
| GEOG 550 | LAND USE IN THE AMERICAN WEST | |
| PS 555 | THE POLITICS OF CLIMATE CHANGE | |
### Fisheries and Wildlife Sciences Minor

Also available at LaGrande and via Ecampus.

**Minor Code: 734**

A sequence in general biology equivalent to BI 211, BI 212, BI 213 or BI 204, BI 205, BI 206 is a prerequisite to the Fisheries and Wildlife Sciences minor. A minimum of 27 credits is required with a combination of the following courses. Double counting restrictions, when applicable, are listed for each section. Double counting towards baccalaureate core is permitted.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
<td>3</td>
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<tr>
<td>FW 251</td>
<td>PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
<td>3</td>
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</tbody>
</table>

**Section 2: Species**

Select one course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FW 302</td>
<td>BIOLOGY AND CONSERVATION OF MARINE MAMMALS</td>
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<tr>
<td>BI 302</td>
<td></td>
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<tr>
<td>FW 311</td>
<td>ORNITHOLOGY</td>
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<tr>
<td>FW 315</td>
<td>ICHTHYOLOGY</td>
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<tr>
<td>FW 317</td>
<td>MAMMALOGY</td>
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<tr>
<td>FW 331</td>
<td>ECOLOGY OF MARINE AND ESTUARINE BIRDS</td>
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<td>Z 473</td>
<td>HERPETOLOGY</td>
</tr>
</tbody>
</table>

**Systematics**

Select one course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FW 312</td>
<td>SYSTEMATICS OF BIRDS</td>
</tr>
<tr>
<td>FW 316</td>
<td>SYSTEMATICS OF FISHES</td>
</tr>
<tr>
<td>FW 318</td>
<td>SYSTEMATICS OF MAMMALS</td>
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<td>Z 474</td>
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</tbody>
</table>

**Section 3: Electives**

Select a minimum of 14–16 credits from the following courses or from Section 2: 14-16

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FES 485</td>
<td>*CONSENSUS AND NATURAL RESOURCES</td>
<td></td>
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<tr>
<td>FW 301</td>
<td>FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION</td>
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<td>FW 303</td>
<td>SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE</td>
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<td>FW 320</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
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<td>FW 321</td>
<td>APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY</td>
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<td>FW 323</td>
<td>MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST</td>
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<td>FW 324</td>
<td>*FOOD FROM THE SEA</td>
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<tr>
<td>FW 325</td>
<td>*GLOBAL CRISIS IN RESOURCE ECOLOGY</td>
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<td>FW 326</td>
<td>INTEGRATED WATERSHED MANAGEMENT</td>
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<td>FW 328/VMB 328</td>
<td>WILDLIFE CAPTURE AND IMMOBILIZATION</td>
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<td>FW 340</td>
<td>*MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES</td>
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<tr>
<td>FW 341</td>
<td>FISH AND WILDLIFE LAW ENFORCEMENT</td>
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<tr>
<td>FW 345</td>
<td>*GLOBAL CHANGE BIOLOGY</td>
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<tr>
<td>FW 350</td>
<td>*ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY</td>
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<tr>
<td>FW 356</td>
<td>*CITIZEN SCIENCE</td>
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<tr>
<td>FW 360</td>
<td>*ORIGINS OF F&amp;W MANAGEMENT/EVOLUTION, GENETICS, AND ECOLOGY</td>
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<tr>
<td>FW 366</td>
<td>ENVIRONMENTAL CONTAMINANTS IN FISH AND WILDLIFE</td>
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<td>FW 370</td>
<td>CONSERVATION GENETICS</td>
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<tr>
<td>FW 415</td>
<td>FISHERIES AND WILDLIFE LAW AND POLICY</td>
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<tr>
<td>FW 419</td>
<td>THE NATURAL HISTORY OF WHALES AND WHALING</td>
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<tr>
<td>FW 421/BI 421</td>
<td>AQUATIC BIOLOGICAL INVASIONS</td>
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<tr>
<td>FW 422</td>
<td>INTRODUCTION TO OCEAN LAW</td>
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</tbody>
</table>

All courses on these lists are available online. Students taking on-campus or hybrid courses may find logical substitutions that can be approved by the program director.

**Major Code: 1331**
### Specializations

Through the specialization, undergraduate students are encouraged to become engaged in designing their own education. Students work with faculty in formal and informal settings to define career and life goals and then develop a course of study to achieve those goals.

Specialization plans should be developed during the junior year and will be presented to the faculty for review and comment. Specializations must contain at least 24 credits and must be upper division with four lower-division credits allowed. No courses included may be taken for a satisfactory/unsatisfactory (S/U) grade. A maximum of two courses may be completed prior to approval of the specialization. Additional upper-division credits taken prior to approval of the specialization may be allowed through petition to advisor. Double counting (when credit is given twice for a course) is not permitted between the specialization and other university or departmental course work except in the following circumstances:

- The writing intensive courses (WIC) may double count with the OSU Baccalaureate Core requirements;
- Students completing their first BS degree may apply 12 credits from the minor towards the specialization (requires approval by advisor in minor department and FW advisor);
- Postbaccalaureate students who are completing their second degree may use a maximum of 12 credits from their first degree towards their specialization (approved by FW advisor).

Specializations are given titles to reflect their content, but titles must not substantially duplicate titles of existing degree programs. Examples of specializations include forest wildlife management, stream ecology, fish and wildlife law enforcement, marine fisheries, aquaculture, avian conservation and management, conservation education and extension, fisheries business, human dimensions of resource management, conservation biology, and many others. Specializations may include typical on-campus courses, special field courses (when college credit is earned), a full term of course work at the Hatfield Marine Science Center in Newport, Oregon, or one or more terms of international exchange. A maximum of 12 credits in any combination of FW 401 and FW 410 can be used towards the specialization. Combined with required internships and a capstone course, fisheries and wildlife sciences graduates will be well-prepared to begin professional careers in fish and wildlife conservation, or to continue their education in graduate school. For those students unsure of their professional goals or seeking diversity in course work, a broad specialization may be declared.

### Internships

One of the best avenues to a permanent job in fisheries and wildlife is through a strong internship and temporary employment or volunteer positions. Students are required to complete a minimum of two internships or other approved alternative experiences (one of each type) for their degree. There are two types of internships: exploratory (1–2 credits) and intensive (3–6 credits). Students are encouraged to start gaining professional experience by volunteering or interning with a
natural resource agency as early as possible, and no later than their junior year. This requirement is listed as FW 410, (2 required) (4–6), under the Fisheries and Wildlife Core.

Major Code: 733

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<th>Code</th>
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<tbody>
<tr>
<td></td>
<td><strong>Baccalaureate Core</strong></td>
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<td></td>
<td><strong>Skills Courses (16 credits)</strong></td>
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<td></td>
<td><strong>Fitness</strong></td>
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<td></td>
<td>HHS 231 *LIFETIME FITNESS FOR HEALTH</td>
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<td>HHS 241 *LIFETIME FITNESS (or approved PAC course)</td>
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<td><strong>Mathematics</strong></td>
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<td><strong>Perspective Courses (24 credits)</strong></td>
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<td></td>
<td>Biological Science (Lecture/Lab)</td>
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<tr>
<td></td>
<td>Cultural Diversity (CD)</td>
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<td></td>
<td>Literature and the Arts (LA)</td>
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<td></td>
<td>Physical Science (Lecture/Lab or Lab)</td>
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<td></td>
<td>Met with Fisheries and Wildlife Physical and Earth Sciences sections</td>
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<td></td>
<td>Social Processes and Institutions (SPI)</td>
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<td>Western Culture (WC)</td>
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<td><strong>Difference, Power, and Discrimination Courses (DPD) (3 credits)</strong></td>
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<td>Met with Fisheries and Wildlife Human Dimensions section</td>
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<td><strong>Synthesis Courses (6 credits)</strong></td>
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<td>Select one course from each of the following sections:</td>
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<tr>
<td></td>
<td>Contemporary Global Issues (CGI)</td>
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<td></td>
<td>Science, Technology, and Society (STS)</td>
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<td></td>
<td><strong>Writing Intensive Course (WIC)</strong></td>
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<td>Select one course from the following:</td>
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<tr>
<td></td>
<td>FW 435 *WILDLIFE IN AGRICULTURAL ECOSYSTEMS</td>
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<td>FW 439 *HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT</td>
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<td>FW 454 *FISHERY BIOLOGY</td>
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<td>FW 497 *AQUACULTURE</td>
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<td><strong>Communications</strong></td>
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<td>Select one course from the following:</td>
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<td></td>
<td>WR 222 *ENGLISH COMPOSITION</td>
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<td>HC 199 *HONORS WRITING</td>
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<td>WR 327 *TECHNICAL WRITING</td>
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<td>WR 362 *SCIENCE WRITING</td>
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<td><strong>Fisheries and Wildlife Core (69-71 credits)</strong></td>
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<td>Select one of the following series:</td>
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<td>BI 211 *PRINCIPLES OF BIOLOGY</td>
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<td>&amp; BI 212 and *PRINCIPLES OF BIOLOGY</td>
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<td>&amp; BI 213 and *PRINCIPLES OF BIOLOGY</td>
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<td></td>
<td>Series 2: Introductory Biology</td>
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<td>BI 204 *INTRODUCTORY BIOLOGY I</td>
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<td>&amp; BI 205 and *INTRODUCTORY BIOLOGY II</td>
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<td>&amp; BI 206 and *INTRODUCTORY BIOLOGY III</td>
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<td>Select one of the following series:</td>
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<td>Series 1: General Chemistry</td>
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<td>CH 121 GENERAL CHEMISTRY</td>
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<td>&amp; CH 122 and *GENERAL CHEMISTRY</td>
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<td></td>
<td>&amp; CH 123 and *GENERAL CHEMISTRY</td>
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<td></td>
<td>Series 2: General Chemistry and Lab</td>
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<tr>
<td>BI 351</td>
<td>Marine Ecology</td>
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<td>FES 341</td>
<td>Forest Ecology</td>
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<td>FES 342</td>
<td>Forest Types of the Northwest</td>
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<td>FES 440</td>
<td>Wildland Fire Ecology</td>
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<tr>
<td>FW 345</td>
<td>*Global Change Biology</td>
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<tr>
<td>FW 426</td>
<td>Coastal Ecology and Resource Management</td>
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<td>FW 434/OC 434</td>
<td>Estuarine Ecology</td>
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<td>FW 435</td>
<td>*Wildlife in Agricultural Ecosystems</td>
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<tr>
<td>FW 445/FES 445</td>
<td>Ecological Restoration</td>
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<tr>
<td>FW 452/FES 452</td>
<td>Biodiversity Conservation in Managed Forests</td>
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<td>FW 456</td>
<td>Freshwater Ecology and Conservation</td>
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<td>FW 462</td>
<td>Ecosystem Services</td>
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<td>FW 467</td>
<td>Antarctic Science and Conservation</td>
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<td>FW 479</td>
<td>Wetlands and Riparian Ecology</td>
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<td>RNG 341</td>
<td>Rangeland Ecology and Management</td>
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**Species Conservation and Management**

Select one course from the following: 3-4

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>FW 419</td>
<td>The Natural History of Whales and Whaling</td>
</tr>
<tr>
<td>FW 421/BI 421</td>
<td>Aquatic Biological Invasions</td>
</tr>
<tr>
<td>FW 427</td>
<td>Principles of Wildlife Diseases</td>
</tr>
<tr>
<td>FW 451</td>
<td>Avian Conservation and Management</td>
</tr>
<tr>
<td>FW 454</td>
<td>*Fishery Biology</td>
</tr>
<tr>
<td>FW 458</td>
<td>Mammal Conservation and Management</td>
</tr>
<tr>
<td>FW 464</td>
<td>Marine Conservation Biology</td>
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<tr>
<td>FW 473</td>
<td>Fish Ecology</td>
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<td>FW 474</td>
<td>Early Life History of Fishes</td>
</tr>
<tr>
<td>FW 481</td>
<td>Wildlife Ecology</td>
</tr>
<tr>
<td>FW 491/MB 491</td>
<td>Fish Diseases in Conservation Biology and Aquaculture</td>
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**Botany**

Select one course from the following: 3-4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>BOT 313</td>
<td>Plant Structure</td>
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<tr>
<td>BOT 321</td>
<td>Plant Systematics</td>
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<tr>
<td>BOT 323</td>
<td>*Flowering Plants of the World</td>
</tr>
<tr>
<td>BOT 331</td>
<td>Plant Physiology</td>
</tr>
<tr>
<td>BOT 341</td>
<td>Plant Ecology</td>
</tr>
<tr>
<td>BOT 416</td>
<td>Aquatic Botany</td>
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<tr>
<td>BOT 440</td>
<td>Field Methods in Plant Ecology</td>
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<td>BOT 442</td>
<td>Plant Population Ecology</td>
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<tr>
<td>BOT 488</td>
<td>Environmental Physiology of Plants</td>
</tr>
<tr>
<td>RNG 353</td>
<td>Wildland Plant Identification</td>
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**Physical and Earth Sciences (9-14 credits)**

Select three courses from the following two categories: 4

**Physics, Math, and Chemistry**

Select no more than two courses from the following (cannot double count with FW core): 6-10

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CH 130</td>
<td>General Chemistry of Living Systems</td>
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<tr>
<td>CH 331</td>
<td>Organic Chemistry</td>
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<tr>
<td>CH 332</td>
<td>Organic Chemistry</td>
</tr>
<tr>
<td>CH 390</td>
<td>Environmental Chemistry</td>
</tr>
<tr>
<td>MTH 227</td>
<td>*Calculus and Probability for the Life Sciences I</td>
</tr>
<tr>
<td>MTH 228</td>
<td>*Calculus and Probability for the Life Sciences II</td>
</tr>
<tr>
<td>MTH 241</td>
<td>*Calculus for Management and Social Science</td>
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<tr>
<td>MTH 251</td>
<td>*Differential Calculus</td>
</tr>
<tr>
<td>MTH 252</td>
<td>Integral Calculus</td>
</tr>
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<td>OC 450</td>
<td>Chemical Oceanography</td>
</tr>
<tr>
<td>PH 201</td>
<td>*General Physics</td>
</tr>
<tr>
<td>PH 202</td>
<td>*General Physics</td>
</tr>
<tr>
<td>PH 205</td>
<td>*Solar System Astronomy</td>
</tr>
<tr>
<td>PH 206</td>
<td>*Stars and Stellar Evolution</td>
</tr>
<tr>
<td>PH 207</td>
<td>*Galaxies, Quasars, and Cosmology</td>
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**PH 211** | *General Physics with Calculus |
**PH 212** | *General Physics with Calculus |
**PH 331** | *Sound, Hearing, and Music |
**PH 332** | *Light, Vision, and Color |

**Earth Sciences**

Select no more than two courses from the following: 6-8

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ATS 201</td>
<td>*Climate Science</td>
</tr>
<tr>
<td>GEO 201</td>
<td>*Physical Geology</td>
</tr>
<tr>
<td>GEO 202</td>
<td>*Earth Systems Science</td>
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<td>GEO 203</td>
<td>Evolution of Planet Earth</td>
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<tr>
<td>GEO 221</td>
<td>*Environmental Geology</td>
</tr>
<tr>
<td>GEO 305</td>
<td>*Living with Active Cascade Volcanoes</td>
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<tr>
<td>GEO 307</td>
<td>*National Park Geology and Preservation</td>
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<tr>
<td>GEO 308</td>
<td>*Global Change and Earth Sciences</td>
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<tr>
<td>OC 201</td>
<td>*Oceanography</td>
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<tr>
<td>OC 332</td>
<td>Coastal Oceanography</td>
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**Human Dimensions (9-11 credits)**

Select one course from each of the following lists: 6

**Difference, Power and Discrimination**

Select one course from the following: 3

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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>AG 301</td>
<td>*Ecosystem Science of Pacific NW Indians</td>
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<tr>
<td>FW 340</td>
<td>*Multicultural Perspectives in Natural Resources</td>
</tr>
<tr>
<td>GEO 309</td>
<td>*Environmental Justice</td>
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**Environmental Law, Policy and Economics**

Select one course from the following: 3-4

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<tr>
<td>AEC 250</td>
<td>*Introduction to Environmental Economics and Policy</td>
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<tr>
<td>AEC 253</td>
<td>*Environmental Law, Policy, and Economics</td>
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<tr>
<td>AEC 351</td>
<td>*Natural Resource Economics and Policy</td>
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<td>AEC 352/ECON 352</td>
<td>*Environmental Economics and Policy</td>
</tr>
<tr>
<td>AEC 432</td>
<td>Environmental Law</td>
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<tr>
<td>FOR 462</td>
<td>Natural Resource Policy and Law</td>
</tr>
<tr>
<td>FW 350</td>
<td>*Endangered Species, Society and Sustainability</td>
</tr>
<tr>
<td>FW 415</td>
<td>Fisheries and Wildlife Law and Policy</td>
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<tr>
<td>FW 422</td>
<td>Introduction to Ocean Law</td>
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<td>PPOL 448</td>
<td>Marine Policy in the United States</td>
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<td>PS 475</td>
<td>Environmental Politics and Policy</td>
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<td>PS 477</td>
<td>International Environmental Politics and Policy</td>
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**Other**

Select one course from the following: 3-4

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<tr>
<td>ANTH 477</td>
<td>Ecological Anthropology</td>
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<td>ANTH 481</td>
<td>*Natural Resources and Community Values</td>
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<tr>
<td>BOT 322</td>
<td>Economic and Ethnobotany: Role of Plants in Human Culture</td>
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<td>FES 355</td>
<td>Management for Multiple Resource Values</td>
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<td>FES 422</td>
<td>Research Methods in Social Science</td>
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<td>FES 485</td>
<td>*Consensus and Natural Resources</td>
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<td>FW 224</td>
<td>*Food from the Sea</td>
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<td>FW 225</td>
<td>*Global Crises in Resource Ecology</td>
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<td>FW 260</td>
<td>*Origins of F&amp;W Management/Evolution, Genetics, and Ecology</td>
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<td>FW 391</td>
<td>*Ridge to Reef: Sustainable Resource Management in Palau</td>
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<td>FW 439</td>
<td>*Human Dimensions of Fisheries and Wildlife Management</td>
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<td>GEDG 340</td>
<td>*Introduction to Water Science and Policy</td>
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<td>GENERAL CHEMISTRY</td>
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<td>FW 107</td>
<td>ORIENTATION TO FISHERIES AND WILDLIFE</td>
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<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>FW 209</td>
<td>CAREER SKILLS IN FISHERIES AND WILDLIFE SCIENCES</td>
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<td>Physical &amp; Earth Sciences Course – student choice</td>
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<td>Baccalaureate Core Requirement – student choice</td>
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<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>FW 251</td>
<td>PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
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<td>FW 255</td>
<td>FIELD SAMPLING OF FISH AND WILDLIFE</td>
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<td>COMMUNICATION SKILLS FOR FISHERIES AND WILDLIFE</td>
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<td>ECOLOGY</td>
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<td>FW 307</td>
<td>SPECIALIZATION DEVELOPMENT</td>
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<td>Vertebrate Biology Course – student choice</td>
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<td>Advanced Core Course – student choice</td>
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<td>PAC course elective</td>
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<td>FW 320</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
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<td>INTERNSHIP</td>
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<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<td>Vertebrate Biology Course</td>
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<td>FW 410</td>
<td>INTERNSHIP</td>
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<td>Fall</td>
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<tr>
<td>Advanced Core Course – student choice</td>
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<td>Specialization Course</td>
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Fisheries Management Graduate Certificate

Also available via Ecampus.

Current graduate students must notify the Department of Fisheries and Wildlife of their intention to pursue this certificate. Upon consultation with the certificate program coordinator, they will be given instructions regarding listing courses on their program of study and obtaining the required signature for that form.

For more information, please see our program site (http://ecampus.oregonstate.edu/online-degrees/graduate/fisheries-management/), the departmental website (http://fw.oregonstate.edu) or contact the Certificate Program Director Dr. Bruce Dugger and Graduate Program Coordinator Dr. Susie Dunham at fw.gradadvising@oregonstate.edu.

Certificate Code: CG08

- A minimum of 5 courses and 18 credits of total course work
- A Capstone Project (applying knowledge and skills to a fisheries management issue), equivalent in time and effort to a 3-credit course (FW 506 Projects)
  - One Core course (FW 554 Fishery Biology)
  - A minimum of one course from the Human Dimensions area
  - Two to three courses from the Fisheries Sciences and Management Subject Area
  - For further information, please see our website or email: fw.gradadvising@oregonstate.edu

Courses are offered through Corvallis, at Hatfield Marine Science Center, and through Ecampus. Check the course catalog and schedule of classes for location and term offered.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW 506</td>
<td>PROJECTS</td>
<td>3</td>
</tr>
<tr>
<td>FW 554</td>
<td>FISHERY BIOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

Human Dimensions Subject Area

Select one course from the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FW 515</td>
<td>FISHERIES AND WILDLIFE LAW AND POLICY</td>
</tr>
<tr>
<td>FW 522</td>
<td>INTRODUCTION TO OCEAN LAW</td>
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</table>

Total Hours 17-19

1 Other courses may be substituted upon approval of the certificate director

Certificate Code: CG08

Fisheries Science Graduate Major (MS, PhD)

Graduate Areas of Concentration

Aquaculture, conservation biology, fish genetics, ichthyology, limnology, parasites and diseases, physiology and ecology of marine and freshwater fishes, stream ecology, toxicology, water pollution biology

The Department of Fisheries and Wildlife offers graduate work leading to the Master of Science and Doctor of Philosophy degrees (and participation in the MAIS degree program) with majors in fisheries science.

Fisheries research in graduate studies involves quantitative analyses of marine and freshwater fish populations, water quality, fish systematics, fish and invertebrate physiology, stream ecology, modeling of aquatic ecosystems, land use interactions, endangered species, conservation biology, and aquaculture.

The Oregon Cooperative Fish and Wildlife Research Unit has active research programs funded in part by the Oregon Department of Fish and Wildlife and U.S. Geological Survey. The Agricultural Experiment Station, the Sea Grant program, Forest Science Laboratory and other organizations fund major research projects. The department maintains...
extensive collections of vertebrate species, maintained by Peter
Konstantinidis as curator of vertebrates, with emphasis on larval fishes.
For more information, visit the website (http://fw.oregonstate.edu) or
email fw.gradadvising@oregonstate.edu

Major Code: 1300

Fisheries Science Graduate Minor

Minor Code: 1300

Marine Conservation and Management Minor

Also available via Ecampus.

The Marine Conservation and Management minor focuses on marine vertebrates, conservation science, and management of living marine resources. The core is organized around the three main themes in OSU’s strategic plan of healthy planet, healthy economy, and healthy people. The elective section is broken into two groups of courses, one on species and habitats, the other one experiential learning and skills.

A series in general biology equivalent to the BI 211, BI 212, BI 213 or BI 204, BI 205, BI 206 is a recommended prerequisite to the Marine Conservation and Management Minor.

Minor Code: 788

A minimum of 27 credits is required. Double counting restrictions are listed for each section. Double counting towards the baccalaureate core is permitted in all sections.

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>Core</td>
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<tr>
<td>FW 324</td>
<td>*FOOD FROM THE SEA</td>
<td>3</td>
</tr>
<tr>
<td>FW 426</td>
<td>COASTAL ECOLOGY AND RESOURCE MANAGEMENT</td>
<td>5</td>
</tr>
<tr>
<td>OC 201</td>
<td>*OCEANOGRAPHY</td>
<td>4</td>
</tr>
</tbody>
</table>

Law, Policy, Economics, and Human Dimensions:

Select one course from the following:

| FW 340| *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES | 3     |
| FW 415| FISHERIES AND WILDLIFE LAW AND POLICY            |       |
| FW 422| INTRODUCTION TO OCEAN LAW                        |       |
| OC 333| OCEANS, COASTS, AND PEOPLE                       |       |

Electives

Select at least one course from each of the following categories: 2

| BI 351| MARINE ECOLOGY                                   | 1     |
| BOT 416| AQUATIC BOTANY                                   |       |
| FW 302/BI 302| BIOLOGY AND CONSERVATION OF MARINE MAMMALS  |       |
| FW 323| MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST |       |
| FW 331| ECOLOGY OF MARINE AND ESTUARINE BIRDS            |       |
| FW 370| CONSERVATION GENETICS                            |       |
| FW 419| THE NATURAL HISTORY OF WHALES AND WHALING        |       |
| FW 421/BI 421| AQUATIC BIOLOGICAL INVASIONS                   |       |
| FW 434/OC 434| ESTUARINE ECOLOGY                         |       |

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<th>Code</th>
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<th>Hours</th>
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<tr>
<td>FW 454</td>
<td>*FISHERY BIOLOGY</td>
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<tr>
<td>FW 464</td>
<td>MARINE CONSERVATION BIOLOGY</td>
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<td>FW 465</td>
<td>MARINE FISHERIES</td>
<td></td>
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<tr>
<td>FW 467</td>
<td>ANTARCTIC SCIENCE AND CONSERVATION</td>
<td></td>
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<tr>
<td>FW 474</td>
<td>EARLY LIFE HISTORY OF FISHES</td>
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<tr>
<td>FW 491/MB 491</td>
<td>FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE</td>
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<tr>
<td>FW 497</td>
<td>*AQUACULTURE</td>
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<tr>
<td>FW 498</td>
<td>AQUACULTURE LABORATORY</td>
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<tr>
<td>OC 332</td>
<td>COASTAL OCEANOGRAPHY</td>
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<tr>
<td>OC 440</td>
<td>BIOLOGICAL OCEANOGRAPHY</td>
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<tr>
<td>Z 461</td>
<td>MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY</td>
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Experiential Learning and Skills

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>FW 301</td>
<td>FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION</td>
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<tr>
<td>FW 303</td>
<td>SURVEY OF GEOPHIC INFORMATION SYSTEMS IN NURAL RESOURCE</td>
<td></td>
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<tr>
<td>FW 328/VMB 328</td>
<td>WILDLIFE CAPTURE AND IMMOBILIZATION</td>
<td></td>
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<tr>
<td>FW 469</td>
<td>METHODS IN PHYSIOLOGY AND BEHAVIOR OF MARINE MEGAFUINA</td>
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<tr>
<td>FW 493</td>
<td>FIELD METHODS FOR MARINE RESEARCH</td>
<td></td>
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<tr>
<td>GEOG 201</td>
<td>*FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS</td>
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<tr>
<td>GEOG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
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<tr>
<td>GRAD 430</td>
<td>INTRODUCTION TO SCIENTIFIC DIVING</td>
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<tr>
<td>NS 313</td>
<td>NAVAL OPERATIONS AND SEAMANSHIP</td>
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</tbody>
</table>

Total Hours 28

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Core courses may be double counted
2 None of these courses may be double counted

Minor Code: 788

Wildlife Management Graduate Certificate

Also available via Ecampus.

Current graduate students must notify the Department of Fisheries and Wildlife of their intention to pursue this certificate. Upon consultation with the certificate program coordinator, they will be given instructions regarding listing courses on their program of study and obtaining the required signature for that form.

For more information, please see our program site (https://ecampus.oregonstate.edu/online-degrees/graduate/wildlife-management/), the departmental website (http://fw.oregonstate.edu) or contact Certificate Program Director Dr. Bruce Dugger and Graduate Program Coordinator Dr. Susie Dunham at fw.gradadvising@oregonstate.edu

Certificate Code: CG12

- A minimum of 5 courses and 18 credits of total coursework
- A Capstone Project (applying knowledge and skills to a wildlife management issue), equivalent in time and effort to a 3-credit course (FW 506)
- A minimum of one course from the Human Dimensions area
- Three to four courses from the Wildlife Sciences and Management Subject Area
Courses are offered through Corvallis, at Hatfield Marine Science Center, and through Ecampus.

The Department of Fisheries and Wildlife offers graduate work leading to the Master of Science and Doctor of Philosophy degrees (and participation in the MAIS degree program) with majors in wildlife science.

The wildlife graduate program in the Department of Fisheries and Wildlife includes wildlife research concerning the interaction of wildlife with land uses, migratory waterfowl, upland game birds, forest bird communities, endangered species, population dynamics, and conservation biology.

The Oregon Cooperative Fish and Wildlife Research Unit has active research programs funded in part by the Oregon Department of Fish and Wildlife and U.S. Geological Survey. The Agricultural Experiment Station, the Sea Grant program, Forest Science Laboratory and other organizations fund major research projects. The department maintains extensive collections of vertebrate species, maintained by Peter Konstantinidis as curator of vertebrates, with emphasis on larval fishes.

For more information, visit the website (http://fw.oregonstate.edu) or email fw.gradadvising@oregonstate.edu

Certificate Code: CG12

Wildlife Science Graduate Major (MS, PhD)

Graduate Areas of Concentration

Animal-habitat relationships; behavior; biology of big game and small mammals; conservation biology; community studies; ecology of avian and mammalian predators; ecology of waterfowl and upland gamebirds; effects of parasites, diseases, and environmental contaminants; nutrition; population; population dynamics; reproductive biology; toxicology of pesticides; wildlife ecology; wildlife-forestry interactions; wildlife science

The Department of Fisheries and Wildlife offers graduate work leading to the Master of Science and Doctor of Philosophy degrees (and participation in the MAIS degree program) with majors in wildlife science.

The wildlife graduate program in the Department of Fisheries and Wildlife includes wildlife research concerning the interaction of wildlife with land uses, migratory waterfowl, upland game birds, forest bird communities, endangered species, population dynamics, and conservation biology.

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For more information, visit the website (http://fw.oregonstate.edu) or email fw.gradadvising@oregonstate.edu

Major Code: 1750

Wildlife Science Graduate Minor

Minor Code: 1750

Food Science and Technology

Food science and technology concerns the chemistry and engineering necessary to deliver safe, convenient food products from the farm gate to the food marketer. The academic program integrates principles and concepts in the physical, biological, and engineering sciences, and applies them to the scientific and technological aspects of food and beverage processing. The role of the food scientist is to successfully integrate these disciplines to assure an abundant, high quality, and nutritious food supply.

Graduate programs leading to the MS or PhD degree in food science permit intensified study in subject areas of special interest. Research areas in the department include both basic and applied aspects of chemistry/biochemistry, microbiology/biotechnology, sensory analysis, and food engineering. Research in food processing operations covers a number of food commodities such as cereal products, dairy products, fruits, vegetables, meats, seafood, wines and beers.

Departmental facilities include well-equipped laboratories, a pilot plant, a winery, a pilot research brewery, and an artisan cheese-making plant for instruction and research. Research facilities also are available at the Coastal Oregon Marine Experiment Station Seafood Laboratory at Astoria and the Food Innovation Center in Portland, Oregon.

Work Experience and Internships

Because of the educational value of professional work experience, the department strongly encourages students to gain practical work experience during summer and other terms. Students typically work in brewing, wineries, dairy processing, and seasonal fruit and vegetable processing. Students may earn internship credit with prior approval of the department and of the employer. OSU students may also participate in international internship programs.
Scholarships
The College of Agricultural Sciences, the department, the food industry, and the Institute of Food Technologists offer over 25 merit and financial need scholarships to encourage students preparing for careers in the food industry. For more information, contact the department, 541-737-3131, and the Office of Financial Aid and Scholarships, 541-737-2241.

Career Opportunities
Food science graduates have had excellent success in finding positions (median nationwide entry level salary for bachelor of science degree holders is $50,000) in an industry that possesses tremendous variety, mobility and opportunity for advancement. Career opportunities in the food, brewing, distilling, and enology industries include management, research and development, process and production supervision, quality assurance, distribution, sales, marketing, consulting, and trade associations. Governmental agencies employ food scientists for work in regulatory control, research, and the development of food standards.

Graduates of a master’s or doctoral program hold positions in teaching, colleges and university research and extension, and in industry.

Undergraduate Programs
Major
• Food Science and Technology (p. 160)
  Options:
  • Enology and Viticulture
  • Fermentation Science
  • Food Science

Minors
• Fermentation Science (p. 159)
• Food Manufacturing (p. 159)
• Food Science (p. 167)
• Food Technology (p. 167)

Graduate Programs
Major
• Food Science and Technology (p. 159)

Minor
• Food Science and Technology (p. 160)

Robert J. McGorrin, Head
100 Wiegand Hall
Oregon State University
Corvallis, OR 97331-6602
Phone: 541-737-3131
Email: robert.mcgorrin@oregonstate.edu
Website: http://oregonstate.edu/foodsci/home

Faculty
Professors Daeschel, Goddik, McGorrin, Morrissey, Park, Qian, Shay, Ross, Shellhammer, Su, Zhao
Associate Professors Bakalinsky, DeWitt, Lim, Osborne, Penner, Torres
Assistant Professors Hughes, Tomasino, Waite-Cusic
Senior Instructor 1 Smith

Instructor Just

Food Science and Technology
FST 101. FOOD SCIENCE ORIENTATION. (1 Credit)
For food science majors. Orientation and academic guidance toward career planning in food science and technology.

FST 199. SPECIAL STUDIES. (1-16 Credits)
Graded P/N. This course is repeatable for 16 credits.

FST 210. FRUIT AND VEGETABLE PROCESSING. (3 Credits)
Lectures, lab activities and plant tours to help majors and non-majors understand traditional and modern fruit and vegetable processing technologies.
Recommended: CH 123 or CH 223 or ((CH 233 or CH 233H) and (CH 263 or CH 263H))

FST 212. DAIRY PROCESSING. (2 Credits)
Methods of processing and preserving milk and milk products and related unit operations.
Recommended: CH 123 or CH 223 or CH 233 or CH 233H

FST 213. DAIRY PROCESSING LABORATORY. (1 Credit)
Laboratory and field work to accompany FST 212. Field trip required.
Recommended: Concurrent enrollment in FST 212

FST 251. INTRODUCTION TO WINES, BEERS, AND SPIRITS. (3 Credits)
A descriptive introduction to the history, science, sensory, economics, and societal aspects of alcoholic beverages.
Recommended: High school biology and chemistry

FST 260. *FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE. (3 Credits)
Exploring the sciences and technologies of food processing and preservation within the context of their historical, current, and possible future influences on what we eat, the structure of our society, and our day-to-day lives. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

FST 273. *WINE IN THE WESTERN WORLD. (3 Credits)
A study of wine throughout history, from its accidental discovery and refinement through today, with a focus on the profound role wine plays in agriculture, social rituals, human health, economics, and the ambivalent pursuit of pleasure. (Baccalaureate Core Course)
Attributes: CPWC – Core, Pers, West Culture

FST 315. PILOT PLANT EXPERIENCES. (2 Credits)
Students will be working in one of the FST pilot plants (dairy, vegetables/fruit, brewing, wine making, distilling) and will be assisting with the manufacturing of foods or beverages. Students must have available blocks of time in their schedules to contribute significantly to a production run. Production schedules for each pilot plant will be determined in advance of registration for each term. Not all pilot plants will be available each term. Lab.

FST 360. FOOD SAFETY AND SANITATION. (3 Credits)
Principles, practices, and regulations governing and ensuring the microbiological safety of our food supply through risk assessment, surveillance, and intervention.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better or BI 212 with D- or better or BI 212H with D- or better or BI 213 with D- or better or BI 213H with D- or better) and (CH 121 [D-] or CH 221 [D-] or CH 221H [D-] or CH 231 [D-] or CH 231H [D-])
FST 370. INDUSTRY PREPARATION/HACCP. (3 Credits)
Assists students in preparation for internships and employment in the food industry by introducing compliance with food safety regulations, HACCP, and audits.
Recommended: One year of chemistry and one year of biology.

FST 385. COMMUNICATING FOOD AND FERMENTATION SCIENCE. (3 Credits)
This writing intensive course (WIC) will guide students in the investigation and critical evaluation of literature on a topic of current interest in food or fermentation science, and the development of their ability to write concisely and with precision about technical subject matter in this discipline. Lec/rec. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WR 121 with C- or better and FST 360 [D-] and MB 302 (may be taken concurrently) [D-]
Recommended: Completion of Bacc Core Writing II requirement

FST 399. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: FST 399H
This course is repeatable for 16 credits.

FST 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: FST 399
This course is repeatable for 16 credits.

FST 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FST 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FST 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FST 407. SENIOR SEMINAR. (1 Credit)

FST 410. INTERNSHIP. (1-16 Credits)
A work internship to give students practical on-the-job training in the food processing or related industries. Graded P/N.
This course is repeatable for 16 credits.

FST 420. SENSORY EVALUATION OF FOOD. (4 Credits)
Sensory test methods used in the evaluation of the taste, smell, texture, and color of foods as well as the evaluation of consumer acceptance of foods. This includes methods for measuring sensory qualities, underlying psychological principles, statistical methods for analyzing data, and proper interpretation of these results. Lec/lab.
Prerequisites: (ST 351 with C- or better or ST 411 with C- or better) and (ST 352 (may be taken concurrently) [D-] or ST 412 (may be taken concurrently) [D-])

FST 421. *FOOD LAW. (3 Credits)
Concepts, statutes, regulations, and agencies controlling the production, processing, and distribution and promotion of food. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

FST 422. FOOD CHEMISTRY FUNDAMENTALS. (4 Credits)
An integrated lecture/lab/recitation course applying theories of molecular reactivity to model food systems. Lectures focus on the molecular bases of chemical phenomena that dictate the behavior of foods. Laboratories and recitations provide opportunities for students to observe, manipulate, and explore model food systems. Emphasis on major food components (water, lipids, proteins, and carbohydrates) and their behavior under conditions of particular relevance to food processing. Lec/lab/rec.
Prerequisites: (BB 350 with D- or better or BB 450 with D- or better or BB 450H with D- or better) and (CH 332 [C-] or CH 336 [C-]) and (MTH 228 (may be taken concurrently) [D-] or MTH 252 (may be taken concurrently) [D-] or MTH 252H (may be taken concurrently) [D-])

FST 423. FOOD ANALYSIS. (4 Credits)
An integrated laboratory/lecture course covering methods used for the quantitative analysis of the chemical composition of foods and agricultural products.
Recommended: CH 324 and CH 337 and BB 350

FST 425. FOOD SYSTEMS CHEMISTRY. (4 Credits)
The chemistry of food components in real-world food systems. Focused on water, proteins, carbohydrates, lipids, and food polymers, their interactions, and the effects of food processing and storage. Integrates writing as a learning tool and means of professional communication. Lec/lab.
Prerequisites: FST 422 with D- or better

FST 430. READING AND CONFERENCE. (1-16 Credits)
FST 437. CHEMISTRY AND BIOCHEMISTRY OF DISTILLED SPIRITS. (3 Credits)
The underlying science of the production of the distilled spirits will be discussed systematically. The course will cover the requirements for water, the major raw materials (eg. cereals, fruits, agave, syrups, and woods for maturation) and the conversion of these into fermentable extract. The scientific principles of fermentation will be explored, in the context of both ethanol and secondary metabolite production. Distillation will be considered, in terms of the physics and chemistry of liquid-liquid separations, before discussing post-fermentation options such as blending, maturation and product finishing.
Prerequisites: FST 251 with C- or better and BB 350 (may be taken concurrently) [D-]

FST 438. PRODUCTION AND ANALYSIS OF DISTILLED SPIRITS. (3 Credits)
Building on the prerequisite course, this course compares and contrasts different approaches to the manufacture of distilled spirits by using some of the major spirit categories as examples. The management of a distilled spirits production plant in terms of legislative, safety and process/ product quality will be discussed before explicit consideration of the requirements for establishing a distilled spirits production plant. Successful completion of this course will provide students with a broad understanding of the distilled spirits sector.
Prerequisites: FST 437 with D- or better
This course is repeatable for 3 credits.
FST 460. BREWING SCIENCE. (3 Credits)
Chemistry, microbiology and engineering of malting and brewing operations for the production of beer, including the compositional analysis of barley, malt, hops, water, and beer and their effects on beer quality.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-]
Recommended: Completion or concurrent enrollment in BEE 472 and MB 302

FST 461. BREWING ANALYSIS. (3 Credits)
Compositional analysis, laboratory techniques and sensory evaluation of barley, malt, hops, water, yeast and beer. Lec/lab.
Prerequisites: FST 460 with D- or better and (MB 303 [D-] or MB 303H [D-])

FST 466. WINE PRODUCTION PRINCIPLES. (3 Credits)
Principles of wine production technology from grape berry development through bottling, covering the microbiology and chemistry of fermentation, aging and production practices of red and white table wines, as well as sparkling and dessert wines.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-]
Recommended: BB 350 and MB 302

FST 467. WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION. (5 Credits)
An integrated lecture/lab course that focuses on the practical fundamentals of red and white wine production. Students will make wine and monitor its progression from the grape to the bottle using standard chemical, microbial, and sensorial techniques.
Prerequisites: FST 466 with D- or better and FST 479 (may be taken concurrently) [D-]

FST 479. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSTLISTED as FST 479/MB 479 and FST 579/MB 579.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-] and (BB 350 [D-] or BB 450 [D-]) and MB 302 [D-]
Equivalent to: MB 479

FST 480. TOPICS IN FERMENTATION. (0-2 Credits)
Selected topics in fermentation science will be presented by department faculty and invited outside experts. Topics and format will change each quarter. Students may take the course for 1 or 2 credits as the topics change. Lec/lab.
This course is repeatable for 8 credits.

FST 490. FOOD PROCESSING CALCULATIONS. (2 Credits)
Application of engineering principles to produce safe processed foods meeting consumer expectations for safety and quality. Validate process engineering models by comparing predicted values with new experimental data.
Prerequisites: BEE 472 with D- or better and FST 360 [D-]
Corequisites: FST 491

FST 491. FOOD PROCESSING CALCULATIONS LABORATORY. (1 Credit)
Experiments in a pilot plant supported by a computer laboratory. Prepare samples of novel process technology products.
Corequisites: FST 490
Recommended: Microsoft Excel skills.
FST 523. FOOD ANALYSIS. (4 Credits)
An integrated laboratory/lecture course covering methods used for the quantitative analysis of the chemical composition of foods and agricultural products.
Recommended: CH 324 and CH 337 and BB 350

FST 525. FOOD SYSTEMS CHEMISTRY. (4 Credits)
The chemistry of food components in real-world food systems. Focused on water, proteins, carbohydrates, lipids, and food polymers, their interactions, and the effects of food processing and storage. Integrates writing as a learning tool and means of professional communication. Lec/ lab/rec.
Prerequisites: FST 522 with C or better

FST 537. CHEMISTRY AND BIOCHEMISTRY OF DISTILLED SPIRITS. (3 Credits)
The underlying science of the production of the distilled spirits will be discussed systematically. The course will cover the requirements for water, the major raw materials (eg. cereals, fruits, agave, syrups, and woods for maturation) and the conversion of these into fermentable extract. The scientific principles of fermentation will be explored, in the context of both ethanol and secondary metabolite production. Distillation will be considered, in terms of the physics and chemistry of liquid-liquid separations, before discussing post-fermentation options such as blending, maturation and product finishing.
Prerequisites: FST 537 with D- or better
Recommended: FST 527 with C or better

FST 538. PRODUCTION AND ANALYSIS OF DISTILLED SPIRITS. (3 Credits)
Building on the prerequisite course, this course compares and contrasts different approaches to the manufacture of distilled spirits by using some of the major spirit categories as examples. The management of a distilled spirits production plant in terms of legislative, safety and process/ product quality will be discussed before explicit consideration of the requirements for establishing a distilled spirits production plant. Successful completion of this course will provide students with a broad understanding of the distilled spirits sector.
Prerequisites: FST 537 with D- or better
This course is repeatable for 3 credits.

FST 560. BREWING SCIENCE. (3 Credits)
Chemistry, microbiology and engineering of malting and brewing operations for the production of beer, including the compositional analysis of barley, malt, hops, water, and beer and their effects on beer quality.
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and completion or concurrent enrollment in BEE 472 and MB 302

FST 561. BREWING ANALYSIS. (3 Credits)
Compositional analysis, laboratory techniques and sensory evaluation of barley, malt, hops, water, yeast and beer. Lec/lab.
Recommended: FST 460 and (MB 303 or MB 303H)

FST 566. WINE PRODUCTION PRINCIPLES. (3 Credits)
Principles of wine production technology from grape berry development through bottling, covering the microbiology and chemistry of fermentation, aging and production practices of red and white table wines, as well as sparkling and dessert wines.
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and BB 350 and MB 302

FST 567. WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION. (5 Credits)
An integrated lecture/lab course that focuses on the practical fundamentals of red and white wine production. Students will make wine and monitor its progression from the grape to the bottle using standard chemical, microbial, and sensorial techniques.
Prerequisites: FST 566 with C or better
Corequisites: FST 579

FST 579. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors.
Equivalent to: MB 579
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and (BB 350 or BB 450) and MB 302

FST 595. FOOD PACKAGING. (2 Credits)
Fundamentals of food packaging covering the major packaging solutions with a focus on plastic, paper, and paperboard.
Recommended: Junior standing in a physical or biological science-based major.

FST 599. SPECIAL STUDIES. (0-16 Credits)
This course is repeatable for 16 credits.

FST 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FST 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FST 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FST 607. SEMINAR. (1 Credit)
This course is repeatable for 4 credits.

FST 620. ADVANCED TOPICS IN SENSORY SCIENCE. (2 Credits)
Current and/or advanced subjects in human sensory science. Includes 1) topics in human flavor perception that covers human psychophysics, neuroscience, and related fields, and 2) sensory evaluation techniques and data handling methods that are advanced in nature. Different points of view regarding above topics will be discussed.
Prerequisites: FST 520 with C or better
This course is repeatable for 4 credits.

FST 628. FLAVOR CHEMISTRY. (3 Credits)
The definition of flavor, analytical methods in flavor chemistry, and mechanisms of odor interaction in food system will be discussed. In addition, an integrated approach will be used to study the flavor chemistry of economically-important agricultural products in the Pacific Northwest such as dairy products, fruits, and alcoholic beverages.
Recommended: FST 522 and FST 523

FST 639. FOOD POLYMER SCIENCE. (3 Credits)
Investigates the theoretical principles and structure-function relationships of food macromolecules. The theoretical principles are related, where possible, to observable phenomena during thermal processing and storage of foods.
Recommended: (FST 422 or FST 522) and (FST 425 or FST 525)
FST 641. PROCESSING WHEAT AND OTHER SMALL GRAINS: A MOLECULAR VIEW. (3 Credits)
Provides a fundamental overview of wheat and other cereals from the perspective of the molecular level events that are important in milling, baking, and other processes. Uses cereal processing (focused primarily on bread-making) as the vehicle for placing elements of food chemistry, food polymer science, physical chemistry, and rheology into the cohesive framework of a single food category. Students will experience how the sciences of chemistry, physics, engineering, microbiology, biochemistry, nutrition, etc. amalgamate in the production of the selected cereal products. Lec/lab.

FST 666. ADVANCED TOPICS IN ENOLOGY. (3 Credits)
An in-depth investigation of advanced wine processing techniques and wine research, focusing on their impact on production and wine quality. 
Prerequisites: FST 566 with B or better and FST 567 (may be taken concurrently) [B]
Recommended: Viticulture course such as HORT 454 and good understanding of how vineyard practices influence grape quality

Fermentation Science Minor

Minor Code: 141

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FST 251</td>
<td>INTRODUCTION TO WINES, BEERS, AND SPIRITS</td>
<td>3</td>
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<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
<td>2</td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY or BB 350</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives
Select 15 credits of the following: 15

- BIOE 457 BIOREACTORS
- FST 360 FOOD SAFETY AND SANITATION
- FST 460 BREWING SCIENCE
- FST 466 WINE PRODUCTION PRINCIPLES
- FST 467 WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION
- FST 479 FERMENTATION MICROBIOLOGY
- FST 480 TOPICS IN FERMENTATION (take 1–2 credits per class for up to 4 credits)
- MB 440 FOOD MICROBIOLOGY
- MB 441 FOOD MICROBIOLOGY LABORATORY

Total Hours 27

Minor Code: 141

Food Manufacturing Minor

The Food Manufacturing minor introduces students to several engineering and operations concepts. A key component of the minor is a three-month manufacturing internship at a food processing facility. Prior to the internship, students will work within the department’s pilot plants, producing at least one of cheese, beer, wine, liquors, or fruit and vegetable products.

Minor Code: 797

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
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<tr>
<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
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</tr>
<tr>
<td>FST 315</td>
<td>PILOT PLANT EXPERIENCES</td>
<td>2</td>
</tr>
<tr>
<td>FST 410</td>
<td>INTERNSHIP</td>
<td>3</td>
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</tbody>
</table>

ST 351 INTRODUCTION TO STATISTICAL METHODS 4
Select one course from the following: 4
- MTH 251 *DIFFERENTIAL CALCULUS
- MTH 252 INTEGRAL CALCULUS
- MTH 258

Select 10-12 credits from the following: 10-12
- BA 351 MANAGING ORGANIZATIONS
- ENGR 390 ENGINEERING ECONOMY
- IE 355 STATISTICAL QUALITY CONTROL
- IE 471 PROJECT MANAGEMENT IN ENGINEERING
- MFGE 436 LEAN MANUFACTURING SYSTEMS ENGINEERING

Total Hours 27-29

* Baccalaureate Core Course (BCC)

Minor Code: 797

Food Science and Technology Graduate Major (MS, PhD)
Graduate Areas of Concentration

Brewing, enology, flavor chemistry, food chemistry/biochemistry, food engineering, food microbiology/biotechnology, food and seafood processing, sensory evaluation

The Department of Food Science and Technology offers graduate programs leading toward the Master of Science and Doctor of Philosophy degrees. A variety of research specializations is available covering the chemical, physical, microbiological, and sensory properties of foods.

Food processing and engineering research deals with basic and applied aspects of contemporary food technologies. Areas of emphasis include the measurement and modeling of thermo-physical properties of foods and the modeling of heat and mass transfer phenomena. Other studies deal with the use of high pressure as a means of food preservation and the use of edible food coatings to enhance the nutritional quality of fresh fruits and vegetables.

Wine-related studies include relationships between sensory and chemical data and the effects of processing, wine microorganisms, and vineyard practices on quality.

Food processing research concerns milk quality, cheese technology, and cheese economics.

With over 75 years of history breeding and studying hops at OSU, the brewing research within FST connects to this long history by examining the flavor and stability of hops and hoppiness aroma in beer as well as improved economics.

Studies in food microbiology focus on food safety and the application of beneficial microorganisms in food production. Included in this topic area are studies dealing with the effect of processing conditions on microbial viability and the characterization of yeast strains involved in fermented products.

Sensory science projects focus on an understanding of the fundamental nature of sensory phenomena and characterization of the sensory attributes of selected products.

Food chemistry research concerns the occurrence, role, formation, stability and analysis of various food constituents. Studies involving flavor chemistry and sensory evaluation aim to identify the flavor-active
compounds of a wide variety of foods and beverages. Other studies focus on understanding the functional properties of cereal grains and development of environmentally sustainable chemical and biological processes for converting food wastes and related renewable waste streams into useful byproducts.

Investigations on seafood processing and by-product utilization are being conducted on the campus, and at the Coastal Oregon Marine Experiment Station Seafood Laboratory in Astoria, Oregon.

The Food Innovation Center in Portland, Oregon—OSU's most unusual agricultural experiment station—provides entrepreneurs advice, testing and feedback on product development, packaging and shelf-life evaluation, sensory and consumer testing, marketing planning and access and business development.

Students desiring to pursue graduate study must have a BS degree or equivalent. Students from related fields of study (chemistry, microbiology, biology, etc.) should have a strong background in the basic sciences and must have earned at least a B (GPA 3.0) average during their last two years of undergraduate study.

Major Code: 1350

Food Science and Technology Graduate Minor

Minor Code: 1350

Food Science and Technology Undergraduate Major (BS, HBS)

A bachelor’s degree in Food Science and Technology provides the necessary foundation to pursue any of the many possible food and beverage related career paths. The program integrates principles and concepts in the physical, biological and engineering sciences (including courses in general chemistry, organic chemistry, biology, physics, math and statistics, biochemistry, microbiology, and food engineering) and applies them to the scientific and technical aspects of food and beverage processing. Students who achieve at least a 2.00 GPA in the required foundation courses in chemistry additionally earn a Chemistry minor.

In addition to completing the Food Science and Technology Core, students must select from among three options (areas of concentration):

1. Enology and Viticulture
2. Fermentation Science
3. Food Science

All curricula are approved by the Higher Education Committee of the Institute of Food Technologists, making students eligible for national and Oregon IFT scholarships, as well as providing universal degree recognition within the food industry. Beyond choosing an option, students are able to further customize their studies through a menu of elective credits, facilitating the development of additional expertise in food related areas such as microbiology, toxicology, nutrition, horticulture, and animal sciences, and crediting formalized career and professional development experiences. Among minors that complement the Food Science and Technology major are Business and Entrepreneurship, Microbiology, and Nutrition.

Major Code: 135

Grade Requirements

All courses required for completion of the Food Science and Technology major must be passed, graded on the A–F scale. Included are both ‘core’ and ‘option’ courses in FST, as well as supporting courses in math, sciences, and written and oral communication.

1. A C– grade, or better, must be earned in the specified prerequisites for the following courses. (These courses have additional prerequisites, but the C– minimum applies to the prerequisites listed below).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BEE 472</td>
<td>INTRODUCTION TO FOOD ENGINEERING PRINCIPLES</td>
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<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
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<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td></td>
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<tr>
<td>or MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
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<tr>
<td>FST 420</td>
<td>SENSORY EVALUATION OF FOOD</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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</tr>
<tr>
<td>FST 422</td>
<td>FOOD CHEMISTRY FUNDAMENTALS</td>
<td>4</td>
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<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<td>FST 466</td>
<td>WINE PRODUCTION PRINCIPLES</td>
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<td>BI 212</td>
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<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>FST 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
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<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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</table>

2. Students must earn at least a 2.00 ‘major’ GPA. The major GPA is a cumulative GPA calculated on a list of courses particular to each option. Selected core and option courses are included, as specified in the list accompanying requirements of each option.

Earning the Degree

To earn a Bachelor of Science (BS) degree in Food Science and Technology, postbaccalaureate students must fulfill all of the FST major core requirements (http://oregonstate.edu/foodsci/prospective-undergraduate-students/), and those of any one of three options: Enology and Viticulture, Fermentation Science, or Food Science.

The Baccalaureate Core (general studies) component of an OSU bachelor’s degree is considered fulfilled by the student’s first degree. Additionally, the university requires that a minimum of 45 credits applied to this degree (32 if the first degree is from OSU) must be completed with
Oregon State University course work completed while enrolled in this degree program.

Additional information for prospective postbaccalaureate students is available at the FST undergraduate department website (http://oregonstate.edu/foodsci/home/).

## Requirements

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<td></td>
<td><strong>Food Science and Technology Core</strong></td>
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<td></td>
<td><strong>Chemistry/Biochemistry Foundation Courses</strong></td>
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<td>BB 350</td>
<td>ELEMENTARY BIOCHEMISTRY</td>
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<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231</td>
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<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
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<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233</td>
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<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4</td>
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<tr>
<td>CH 331 &amp; CH 332</td>
<td>ORGANIC CHEMISTRY and ORGANIC CHEMISTRY</td>
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<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
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<tr>
<td></td>
<td><strong>Mathematics, Physics, and Statistics Foundation Courses</strong></td>
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<td>MTH 111 &amp; MTH 241</td>
<td>*CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I and CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II</td>
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<td>MTH 251 &amp; MTH 252</td>
<td>*DIFFERENTIAL CALCULUS and INTEGRAL CALCULUS</td>
<td>8</td>
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<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
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<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<td><strong>Biological Science Foundation Courses</strong></td>
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<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>MB 302</td>
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<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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<tr>
<td></td>
<td><strong>Communication Foundation Courses</strong></td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
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<td>WR 362</td>
<td>*SCIENCE WRITING</td>
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<td><strong>Food Science and Technology Core Courses</strong></td>
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<tr>
<td>BEE 472</td>
<td>INTRODUCTION TO FOOD ENGINEERING PRINCIPLES</td>
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<td>BEE 473</td>
<td>INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN</td>
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<tr>
<td>FST 360</td>
<td>FOOD SAFETY AND SANITATION</td>
<td>3</td>
</tr>
<tr>
<td>FST 370</td>
<td>INDUSTRY PREPARATION/HACCP</td>
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<tr>
<td>FST 385</td>
<td>*COMMUNICATING FOOD AND FERMENTATION SCIENCE</td>
<td>3</td>
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<tr>
<td>FST 407</td>
<td>SENIOR SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
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<tr>
<td>FST 422</td>
<td>FOOD CHEMISTRY FUNDAMENTALS</td>
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<tr>
<td>FST 425</td>
<td>FOOD SYSTEMS CHEMISTRY</td>
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</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

## Postbaccalaureate Study in FST

### Admission

Students holding a bachelor’s degree from an accredited institution who are otherwise admissible to Oregon State University (http://oregonstate.edu/admissions/main/post-baccalaureate/) will be accepted into the Food Science and Technology major upon meeting the following additional criteria:

All of the following courses (or equivalents) must be completed with a cumulative GPA of 2.25 (4.00 maximum scale). In the case of repeated courses, the second grade earned in the course will be used in the GPA calculation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>BI 213</td>
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<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231</td>
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<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
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<tr>
<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
</tr>
<tr>
<td>MTH 112 &amp; MTH 241</td>
<td>*ELEMENTARY FUNCTIONS and *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4-8</td>
</tr>
<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
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</tr>
</tbody>
</table>

### Major Code: 135

## Enology and Viticulture Option

This option is offered within the following major(s):

- Food Science and Technology - College of Agricultural Sciences (p. 160)

The wine industry in the United States is centered on the West Coast, which produces about 95 percent of our nation’s wines. Oregon is third in the nation in terms of the number of wineries and fourth in the nation in total volume of wine produced. The Oregon wine industry is a rapidly growing industry and is becoming increasingly important to the larger Oregon economy.

The Enology and Viticulture option within the Department of Food Science and Technology prepares students to become successful winemakers. Courses in enology, taught by food science faculty, provide a scientifically-based understanding of wine production. Supporting course work in horticulture, botany and crop and soil science, helps students develop an understanding of the interaction between grape production and winemaking. Graduates in this option will possess the necessary breadth and depth of knowledge and associated practical skills to become independently thinking and successful winemakers.

### Option Code: 635

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>FST 466</td>
<td>WINE PRODUCTION PRINCIPLES</td>
<td>3</td>
</tr>
<tr>
<td>FST 457</td>
<td>WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION</td>
<td>5</td>
</tr>
<tr>
<td>FST 479/MB 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>
Enology and Viticulture Option

### Plant and Soil Science Courses

- **BOT 331** PLANT PHYSIOLOGY 4
- **HORT 301** GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS 3
- **HORT 453** GRAPEVINE GROWTH AND PHYSIOLOGY 3
- **HORT 454** PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION 3
- **SOIL 205** SOIL SCIENCE 3
- **SOIL 206** *SOIL SCIENCE LABORATORY FOR SOIL 205 1

### Enology and Viticulture Option Electives

Select 9 credits of the following: 9

- **AG 407** SEMINAR 1
- **BOT 350** INTRODUCTORY PLANT PATHOLOGY
- **ENT 311** INTRODUCTION TO INSECT PEST MANAGEMENT
- **FST 101** FOOD SCIENCE ORIENTATION
- **FST 251** INTRODUCTION TO WINES, BEERS, AND SPIRITS
- **FST 260** *FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE
- **FST 273** *WINE IN THE WESTERN WORLD
- **FST 401** RESEARCH 1
- **FST 410** INTERNSHIP 1,2
- **FST 420** SENSORY EVALUATION OF FOOD
- **FST 430** INNOVATION AND FOOD PRODUCT DEVELOPMENT
- **FST 480** TOPICS IN FERMENTATION (up to 2 credits of FST 480 may be applied)
- **HORT 251** TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS
- **HORT 316** PLANT NUTRITION
- **HORT 452** BERRY AND GRAPE PHYSIOLOGY AND CULTURE
- **MB 302** GENERAL MICROBIOLOGY
- **MB 303** GENERAL MICROBIOLOGY LABORATORY
- **MB 302** *FOOD IN NON-WESTERN CULTURE
- **TOX 429** TOXIC SUBSTANCES IN FOOD

### FST Major Requirement of 2.00 GPA (Enology and Viticulture Option)

The following courses are included in calculation of the FST major GPA for students in the Enology and Viticulture option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BB 350</td>
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<td>INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN</td>
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<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
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<tr>
<td>CH 234</td>
<td>QUANTITATIVE ANALYSIS</td>
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<tr>
<td>FST 360</td>
<td>FOOD SAFETY AND SANITATION</td>
<td>3</td>
</tr>
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<td>FST 370</td>
<td>INDUSTRY PREPARATION/HACCP</td>
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<tr>
<td>FST 385</td>
<td>*COMMUNICATING FOOD AND FERMENTATION SCIENCE</td>
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<td>FST 407</td>
<td>SENIOR SEMINAR</td>
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<td>FST 421</td>
<td>*FOOD LAW</td>
<td>3</td>
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<tr>
<td>FST 422</td>
<td>FOOD CHEMISTRY FUNDAMENTALS</td>
<td>4</td>
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<tr>
<td>FST 425</td>
<td>FOOD SYSTEMS CHEMISTRY</td>
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<td>FST 466</td>
<td>WINE PRODUCTION PRINCIPLES</td>
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<tr>
<td>FST 467</td>
<td>WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION</td>
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<td>FST 479/MB 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
<td>3</td>
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<tr>
<td>HORT 453</td>
<td>GRAPEVINE GROWTH AND PHYSIOLOGY</td>
<td>3</td>
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<tr>
<td>HORT 454</td>
<td>PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION</td>
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<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
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<td>FST 421</td>
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### Option Code: 635

#### First Year

<table>
<thead>
<tr>
<th>Course</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>BI 211</td>
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<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>FST 101</td>
<td>FOOD SCIENCE ORIENTATION</td>
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<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA (if not placed into MTH 112 or higher)</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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#### Winter

<table>
<thead>
<tr>
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<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
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<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS (if not placed into MTH 251)</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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#### Spring

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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#### Second Year

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<tbody>
<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>FST 251</td>
<td>INTRODUCTION TO WINES, BEERS, AND SPIRITS</td>
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</tbody>
</table>

1. Competitive selection and/or departmental approval required.
2. Students may not earn internship credit in all states. Consult with internship coordinator for list of eligible states.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Students may complete more than one option. Courses must be selected so that at least 12 credits in each option are counted uniquely toward requirements of that option.
Fermentation Science Option

This option is offered within the following major(s):

- Food Science and Technology - College of Agricultural Sciences (p. 160)

The Fermentation Science option, one of just a handful of such programs in the nation, is a hands-on applied science addressing the biological, chemical and physical processes of fermented foods, including those used in the production of wine, beer, and spirits, as well as a variety of other fermented foods such as cheese, yogurt, soy sauce, pickles, breads, and fermented vegetables. Graduates enjoy a wide variety of employment opportunities—including some of the nation's largest wineries and breweries, artisan cheese plants, coffee, soy, and pickle companies, among others. Graduates of the Fermentation Science option can readily cross over from the beverage industry to the food industry with good preparedness.

Option Code: 141

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PH 202</td>
<td>GENERAL PHYSICS</td>
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<td>NUTR 225</td>
<td>GENERAL HUMAN NUTRITION</td>
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<tr>
<td>or NUTR 225</td>
<td>GENERAL HUMAN NUTRITION</td>
<td>3</td>
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<tr>
<td>FST 460</td>
<td>BREWING SCIENCE</td>
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<tr>
<td>FST 466</td>
<td>WINE PRODUCTION PRINCIPLES</td>
<td>3</td>
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<tr>
<td>FST 479/MB 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
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<tr>
<td>FST 490</td>
<td>FOOD PROCESSING CALCULATIONS</td>
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<tr>
<td>FST 491</td>
<td>FOOD PROCESSING CALCULATIONS LABORATORY</td>
<td>1</td>
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<tr>
<td>FST 495</td>
<td>FOOD PACKAGING</td>
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</table>

Select two of the following: 1

- FST 423 | FOOD ANALYSIS | 1-7 |
- FST 461 | BREWING ANALYSIS | 1-7 |
- FST 467 | WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION | 1-7 |

Fermentation Science Option Electives

Select 6-8 credits of the following to bring the total to 37:

- AG 407 | SEMINAR 2 | 1-2 |
- FST 101 | FOOD SCIENCE ORIENTATION | 1-2 |
- FST 212 | DAIRY PROCESSING | 1-2 |
- FST 213 | DAIRY PROCESSING LABORATORY | 1-2 |
- FST 251 | INTRODUCTION TO WINES, BEERS, AND SPIRITS | 1-2 |
- FST 260 | FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE | 1-2 |
- FST 273 | WINE IN THE WESTERN WORLD | 1-2 |
- FST 401 | RESEARCH 2 | 1-2 |
- FST 410 | INTERNSHIP 2,3 | 1-2 |
- FST 420 | SENSORY EVALUATION OF FOOD | 1-2 |
- FST 430 | INNOVATION AND FOOD PRODUCT DEVELOPMENT | 1-2 |
- FST 480 | TOPICS IN FERMENTATION (up to 2 credits of FST 480 may be applied) | 1-2 |
| MB 440 | FOOD MICROBIOLOGY | 1-2 |
| MB 441 | FOOD MICROBIOLOGY LABORATORY | 1-2 |
Fermentation Science Option

1. If all three are selected, credits from one course are applied to the Option Electives requirements.
2. Competitive selection and/or departmental approval required.
3. Students may not earn internship credit in all states. Consult with the internship coordinator for a list of eligible states.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Students may complete more than one option. Courses must be selected so that at least 12 credits in each option are counted uniquely toward requirements of that option.

FST Major 2.00 GPA Requirement (Fermentation Science Option)

The following courses are included in calculation of the FST Major GPA for students in the Fermentation Science option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BB 350</td>
<td>ELEMENTARY BIOCHEMISTRY</td>
<td>4</td>
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<tr>
<td>BEE 472</td>
<td>INTRODUCTION TO FOOD ENGINEERING PRINCIPLES</td>
<td>5</td>
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<tr>
<td>BEE 473</td>
<td>INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN</td>
<td>3</td>
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<tr>
<td>CH 334</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4</td>
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<td>FST 360</td>
<td>FOOD SAFETY AND SANITATION</td>
<td>3</td>
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<tr>
<td>FST 370</td>
<td>INDUSTRY PREPARATION/HACCP</td>
<td>3</td>
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<tr>
<td>FST 385</td>
<td>*COMMUNICATING FOOD AND FERMENTATION SCIENCE</td>
<td>3</td>
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<tr>
<td>FST 407</td>
<td>SENIOR SEMINAR</td>
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<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
<td>3</td>
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<tr>
<td>FST 422</td>
<td>FOOD CHEMISTRY FUNDAMENTALS</td>
<td>4</td>
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<td>FST 425</td>
<td>FOOD SYSTEMS CHEMISTRY</td>
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<td>FST 460</td>
<td>BREWING SCIENCE</td>
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<td>FST 466</td>
<td>WINE PRODUCTION PRINCIPLES</td>
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<td>FST 479/MB 479</td>
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<tr>
<td>FST 490</td>
<td>FOOD PROCESSING CALCULATIONS</td>
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<td>FST 491</td>
<td>FOOD PROCESSING CALCULATIONS LABORATORY</td>
<td>1</td>
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<td>FST 495</td>
<td>FOOD PACKAGING</td>
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<td>MB 302</td>
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<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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<tr>
<td>AG 407</td>
<td>SEMINAR</td>
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<tr>
<td>FST 101</td>
<td>FOOD SCIENCE ORIENTATION</td>
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<tr>
<td>FST 212</td>
<td>DAIRY PROCESSING</td>
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<td>FST 213</td>
<td>DAIRY PROCESSING LABORATORY</td>
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<tr>
<td>FST 251</td>
<td>INTRODUCTION TO WINES, BEERS, AND SPIRITS</td>
<td>3</td>
</tr>
<tr>
<td>FST 260</td>
<td>*FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE</td>
<td>3</td>
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<tr>
<td>FST 273</td>
<td>*WINE IN THE WESTERN WORLD</td>
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<tr>
<td>FST 401</td>
<td>RESEARCH</td>
<td>1-16</td>
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<tr>
<td>FST 410</td>
<td>INTERNSHIP</td>
<td>1-16</td>
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<td>FST 420</td>
<td>SENSORY EVALUATION OF FOOD</td>
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<td>FST 423</td>
<td>FOOD ANALYSIS</td>
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<tr>
<td>FST 430</td>
<td>INNOVATION AND FOOD PRODUCT DEVELOPMENT</td>
<td>4</td>
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<td>FST 461</td>
<td>BREWING ANALYSIS</td>
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<td>FST 467</td>
<td>WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION</td>
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<td>FST 480</td>
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<td>MB 440</td>
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<tr>
<td>NUTR 216</td>
<td>*FOOD IN NON-WESTERN CULTURE</td>
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<tr>
<td>TOX 429</td>
<td>TOXIC SUBSTANCES IN FOOD</td>
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Option Code: 141

Course | Title                                           | Hours |
--------|-------------------------------------------------|------|
First Year
Fall
BI 211 | *PRINCIPLES OF BIOLOGY                          | 4    |
CH 231 | GENERAL CHEMISTRY                               | 4    |
CH 261 | *LABORATORY FOR CHEMISTRY 231                   | 1    |
FST 101 | FOOD SCIENCE ORIENTATION                        | 1    |
MTH 111 | *COLLEGE ALGEBRA (if not placed into MTH 251)   | 4    |
|       | HOURS                                           | 14   |
Winter
BI 212 | *PRINCIPLES OF BIOLOGY                          | 4    |
CH 232 | GENERAL CHEMISTRY                               | 4    |
CH 262 | *LABORATORY FOR CHEMISTRY 232                   | 1    |
COMM 111 | PUBLIC SPEAKING                                 | 3    |
HHS 231 | *LIFETIME FITNESS FOR HEALTH                    | 2    |
PAC     |                                                 | 1    |
|       | HOURS                                           | 15   |
Spring
BI 213 | *PRINCIPLES OF BIOLOGY                          | 4    |
CH 233 | GENERAL CHEMISTRY                               | 4    |
CH 263 | *LABORATORY FOR CHEMISTRY 233                   | 1    |
COMM 111 | PUBLIC SPEAKING                                 | 3    |
HHS 231 | *LIFETIME FITNESS FOR HEALTH                    | 2    |
PAC     |                                                 | 1    |
|       | HOURS                                           | 15   |
Second Year
Fall
CH 331 | ORGANIC CHEMISTRY                               | 4    |
FST 251 | INTRODUCTION TO WINES, BEERS, AND SPIRITS       | 3    |
PH 201 | *GENERAL PHYSICS                                | 3    |
WR 327 | *TECHNICAL WRITING                              | 3    |
|       | HOURS                                           | 16   |
Winter
CH 332 | ORGANIC CHEMISTRY                               | 4    |
FST 273 | *WINE IN THE WESTERN WORLD                      | 3    |
PH 202 | *GENERAL PHYSICS                                | 5    |
NUTR 240 | HUMAN NUTRITION                                 | 3    |
|       | HOURS                                           | 15   |
Spring
BB 350 | ELEMENTARY BIOCHEMISTRY                         | 4    |
FST 360 | FOOD SAFETY AND SANITATION                      | 3    |
MTH 251 | *DIFFERENTIAL CALCULUS                          | 4    |
Baccalaureate Core Perspective: Cultural Diversity | 3    |
|       | HOURS                                           | 14   |
Third Year
Fall
BEE 472 | INTRODUCTION TO FOOD ENGINEERING PRINCIPLES    | 5    |
CH 337 | ORGANIC CHEMISTRY LABORATORY                    | 4    |
MTH 252 | INTEGRAL CALCULUS                               | 4    |
Baccalaureate Core Perspective: Literature and the Arts | 3    |
|       | HOURS                                           | 16   |
Food Science Option

This option is offered within the following major(s):

- Food Science and Technology - College of Agricultural Sciences (p. 160)

Food scientists belong to one of the world’s largest industries—the food industry. From the farm gate to the market, food scientists develop foods and beverages in response to society’s needs and demands, working to make foods safe, nutritious, convenient, economical, and tasty. Food scientists look for better ways to select, preserve, process, and package food products, including the ingredients that go into them. Society’s focus on food has increased as a heightened awareness of diet, health, and biosecurity (or food safety) has increased worldwide.

Graduates of the Food Science option are typically interested in research and development of new products, food safety, sensory and flavor qualities, quality control or quality assurance. Some even work as freelance food technologists.

Option Code: 136

<table>
<thead>
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<th>Code/Statistics Courses</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>PH 202</td>
<td>GENERAL PHYSICS</td>
<td>5</td>
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<tr>
<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
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Nutrition Courses

Select one of the following:

- NUTR 225 GENERAL HUMAN NUTRITION
- NUTR 240 HUMAN NUTRITION

<table>
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<tr>
<th>Food Science and Technology Courses</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FST 420</td>
<td>SENSORY EVALUATION OF FOOD</td>
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<td>FST 423</td>
<td>FOOD ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>FST 490</td>
<td>FOOD PROCESSING CALCULATIONS</td>
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<tr>
<td>FST 491</td>
<td>FOOD PROCESSING CALCULATIONS LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td>FST 495</td>
<td>FOOD PACKAGING</td>
<td>2</td>
</tr>
<tr>
<td>MB 440</td>
<td>FOOD MICROBIOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 3 credits of the following:

- ANS 251 PRINCIPLES OF ANIMAL FOODS TECHNOLOGY
- FST 210 FRUIT AND VEGETABLE PROCESSING
- FST 212 DAIRY PROCESSING
- FST 213 DAIRY PROCESSING LABORATORY

Food Science Option Electives

Select 7 credits of the following:

- AG 407 SEMINAR
- FST 101 FOOD SCIENCE ORIENTATION
- FST 260 *FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE
- FST 273 *WINE IN THE WESTERN WORLD
- FST 401 RESEARCH
- FST 410 INTERNSHIP
- FST 430 INNOVATION AND FOOD PRODUCT DEVELOPMENT
- FST 460 BREWING SCIENCE
- FST 466 WINE PRODUCTION PRINCIPLES
- FST 479/MB 479 FERMENTATION MICROBIOLOGY
- FST 480 TOPICS IN FERMENTATION
- MB 441 FOOD MICROBIOLOGY LABORATORY
- NUTR 216 *FOOD IN NON-WESTERN CULTURE
- TOX 429 TOXIC SUBSTANCES IN FOOD

Total Hours 38

1. Complete 3 credits from the 200-level processing courses (an additional 3 credits from this group may be applied to the option electives).
2. Competitive selection and/or departmental approval required.
3. Students may not earn internship credit in all states. Consult with internship coordinator for list of eligible states.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Students may complete more than one option. Courses must be selected so that at least 12 credits in each option are counted uniquely toward requirements of that option.

FST Major 2.00 GPA Requirement (Food Science Option)

The following courses are included in calculation of the FST Major GPA for students in the Food Science option:
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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BB 350</td>
<td>ELEMENTARY BIOCHEMISTRY</td>
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<td>BEE 472</td>
<td>INTRODUCTION TO FOOD ENGINEERING PRINCIPLES</td>
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<td>BEE 473</td>
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<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
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<td>FST 360</td>
<td>FOOD SAFETY AND SANITATION</td>
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<td>FST 370</td>
<td>INDUSTRY PREPARATION/HACCP</td>
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<td>FST 385</td>
<td>*COMMUNICATING FOOD AND FERMENTATION SCIENCE</td>
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<td>SENIOR SEMINAR</td>
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<td>SENSORY EVALUATION OF FOOD</td>
<td>4</td>
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<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
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<td>FST 422</td>
<td>FOOD CHEMISTRY FUNDAMENTALS</td>
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<td>FST 423</td>
<td>FOOD ANALYSIS</td>
<td>4</td>
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<tr>
<td>FST 425</td>
<td>FOOD SYSTEMS CHEMISTRY</td>
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<td>FST 490</td>
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<tr>
<td>FST 491</td>
<td>FOOD PROCESSING CALCULATIONS LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td>FST 495</td>
<td>FOOD PACKAGING</td>
<td>2</td>
</tr>
<tr>
<td>MB 302</td>
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<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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</tr>
<tr>
<td>MB 440</td>
<td>FOOD MICROBIOLOGY</td>
<td>3</td>
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<tr>
<td>Plus any of the following utilized in fulfillment of option requirements:</td>
<td></td>
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<tr>
<td>AG 407</td>
<td>SEMINAR</td>
<td>3</td>
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<tr>
<td>ANS 251</td>
<td>PRINCIPLES OF ANIMAL FOODS TECHNOLOGY</td>
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<td>FST 101</td>
<td>FOOD SCIENCE ORIENTATION</td>
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<td>FST 210</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 136

### First Year

#### Fall

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>BI 211</td>
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<td>CH 231</td>
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<td>PH 201</td>
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<td>PH 202</td>
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### Third Year

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<td>*FOOD LAW</td>
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<td>FST 495</td>
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Winter

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Baccalaureate Core Perspective: Social Processes and Institutions 3

Unrestricted Elective 1

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Spring

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<td>FST 490</td>
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| Baccalaureate Core: Difference, Power and Discrimination 3
| Baccalaureate Core Synthesis: Contemporary Global Issues 3

Unrestricted Elective 2

Total Hours 15

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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

# Food Science Minor

**Minor Code: 136**

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<td>FOOD CHEMISTRY FUNDAMENTALS</td>
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<td>PRINCIPLES OF ANIMAL FOODS TECHNOLOGY</td>
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<tr>
<td>BEE 472</td>
<td>INTRODUCTION TO FOOD ENGINEERING PRINCIPLES</td>
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<td>BEE 473</td>
<td>INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN</td>
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<td>FRUIT AND VEGETABLE PROCESSING</td>
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<td>FST 251</td>
<td>INTRODUCTION TO WINES, BEERS, AND SPIRITS</td>
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<td>FST 260</td>
<td>*FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE</td>
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<td>FST 273</td>
<td>*WINE IN THE WESTERN WORLD</td>
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<td>FST 420</td>
<td>SENSORY EVALUATION OF FOOD</td>
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<td>FST 421</td>
<td>*FOOD LAW</td>
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Total Hours 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

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Minors Code: 137

## Food Technology Minor

**Minor Code: 137**

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<td>FST 360</td>
<td>FOOD SAFETY AND SANITIZATION</td>
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<td>FST 251</td>
<td>INTRODUCTION TO WINES, BEERS, AND SPIRITS</td>
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<td>FST 260</td>
<td>*FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE</td>
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<td>FST 420</td>
<td>SENSORY EVALUATION OF FOOD</td>
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<td>FST 480</td>
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Total Hours 27

* Baccalaureate Core Course (BCC)
^ Six credits must be upper division

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# Horticulture

Horticulture involves the production, genetic improvement, storage, and marketing of fruits, nuts, vegetables, flowers, and vegetable crops; and the design, construction, and management of landscape plantings such as parks, gardens, golf courses, restoration projects, and sports fields. It is a science, an art, an avocation, and a business.

Horticultural and other high-value specialty crops are the largest components of Oregon’s agricultural industry. Landscape horticulture is a rapidly expanding service industry in the urban areas of the Pacific Northwest and throughout the nation. Excellent and varied career opportunities exist for college graduates in both crop and landscape horticulture.

The undergraduate program provides students with a solid background in the fundamental life and physical sciences, as well as an understanding of the technologies and management systems used in the horticultural industry. Problem-solving and decision-making skills are stressed, as is student involvement. Field trips are an important component of many of the courses.

The program has seven options:

1. Ecological Management of Turf, Landscape & Urban Horticulture
2. General Horticulture (Online)
3. Horticultural Research
4. Plant Breeding and Genetics
5. Sustainable Horticultural Production
6. Therapeutic Horticulture
7. Viticulture and Enology

The Ecological Management of Turf, Landscape & Urban Horticulture option prepares students for careers in turf management or sustainable landscape design.

The General Horticulture option is an online option and is especially recommended for students already working in the horticultural industry, whose careers will benefit from post-secondary education in the horticultural sciences.

The Horticultural Research option prepares students to assist in research or to pursue graduate studies.

The Plant Breeding and Genetics option provides an interdisciplinary approach to applied plant breeding and practical experience in breeding and genetic analysis working in the greenhouse, field, and laboratory.

The Sustainable Horticultural Production option prepares students for careers dealing directly or indirectly with the production, breeding, post-harvest handling, marketing, and scientific study of horticultural crops.

The Therapeutic Horticulture option prepares students to design healing and adapted gardens and to provide therapy programs used to improve the quality of people’s lives.

The Viticulture and Enology option prepares students for careers in Oregon’s growing vineyard and winery industry.

All options allow the student considerable flexibility to pursue a minor or to tailor course work to meet individual goals. Qualified students interested in the business aspects of horticulture are encouraged to pursue a minor in business. All undergraduates are required to complete either an approved internship or an undergraduate research project.

A high school student preparing for the program should follow a well-balanced college preparatory curriculum. Course work in biology, chemistry, and mathematics is strongly recommended. Course work in the social sciences, humanities, arts, and foreign languages is also encouraged, and the student should develop public speaking and writing abilities.

The program was designed to facilitate timely completion of degree requirements by transfer and postbaccalaureate students. Students intending to transfer into the program from a two- or four-year institution should complete as many of the lower-division requirements as possible. Some professional-technical courses from community colleges may be equivalent to lower-division horticulture courses. Equivalent credit can be given for such courses. Contact a departmental advisor for further information.

For additional information about the program, contact one of the undergraduate advisors: Kelly Donegan (head advisor, all options) and Sarah McDonald (advisor for the General Horticulture option).

### Undergraduate Program

#### Major
- Horticulture (p. 176)

<table>
<thead>
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<th>Options:</th>
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<tr>
<td>Ecological Management Turf, Landscape &amp; Urban Horticulture (p. 177)</td>
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<tr>
<td>General Horticulture (p. 178)</td>
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<tr>
<td>Horticultural Research (p. 180)</td>
</tr>
<tr>
<td>Plant Breeding and Genetics (p. 182)</td>
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<td>Sustainable Horticultural Production (p. 184)</td>
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<tr>
<td>Therapeutic Horticulture (p. 186)</td>
</tr>
<tr>
<td>Viticulture and Enology (p. 188)</td>
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#### Minors
- Entomology (p. 131)
- Horticulture (p. 176)
- Turf and Landscape Management (p. 191)

#### Certificate
- Organic Farming Systems (p. 190)

#### Graduate Programs

### Major
- Horticulture (p. 174)

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<tr>
<td>Plant Breeding and Genetics</td>
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### Minor
- Horticulture (p. 176)

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**Bill Braunworth, Department Head**
4017 Agricultural and Life Sciences Building
Oregon State University
Corvallis, OR 97331-7304
Phone: 541-737-1317
Email: bill.braunworth@oregonstate.edu
Website: http://horticulture.oregonstate.edu/

### Faculty

**Professors** Bell, Kaiser, Langellotto, Mehlenbacher, Myers, Strik, Walton
**Associate Professors** Andrews, Braunworth, Bubl, Castagnoli, Contreras, Deluc, Detweiler, Kowalewski, Lambrinos, W. Miller, Nonogaki, Peachey, Powell, Renquist, Rosetta, Sagili, Skinkis, Stone, Yang

**Assistant Professors** Bouska, Coop, Edmunds, Formiga, Garrett, Hooven, Levin, Lukas, Melathopoulos, Moretti, Nackley, Runkel, Sanchez, Stoven, Thompson, Vining, Wada, Wiman

**Instructors** Bonady, Danler, Dixon, Donegan, Lloyd, B. Miller, Millison, Nelson, Scherr, Shay, Stock

**Courtesy Faculty**
Albert, Bassil, Bryla, Chernoh, Choi, Einhorn, Finn, Hedstrom, Hummer, Jeknic, Lee, Martin, Reed, Rendon, Scagel, Schreiner, Seiter

**Adjunct Faculty**
Bondi, Kennedy, Landgren, Stephenson

---
Horticulture

HORT 112. INTRODUCTION TO HORTICULTURAL SYSTEMS, PRACTICES AND CAREERS. (2 Credits)
Overview of horticultural systems and practices, with an emphasis on the Pacific Northwest. Exploration of career opportunities in horticulture. Includes viticulture, environmental landscaping, turf management, greenhouse and nursery production, farming, education, and research. Required field trips.

HORT 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: HORT 199H
This course is repeatable for 16 credits.

HORT 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 199
This course is repeatable for 16 credits.

HORT 212. INTRODUCTION TO ORGANIC AGRICULTURAL SYSTEMS. (4 Credits)
An introduction to organic agricultural systems with a focus on history, regulations, principles and practices, performance, trends, and careers.

HORT 217. *SOCIAL IMPACTS OF SCIENCE. (3 Credits)
Contemporary societies provide funding for scientific research, at the same time they struggle with existing and emerging societal problems. This course will discuss how social problems can be addressed by science and technology, and how the impacts of research are quantified.
(Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

HORT 226. LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS. (4 Credits)
Identification of trees, shrubs, vines, and ground covers used in landscape horticulture. Basic plant taxonomy, nomenclature, anatomy, and use of plants in the landscape. Diverse plant material covered with an emphasis on deciduous hardwoods and conifers.

HORT 228. LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING TREES AND SHRUBS. (4 Credits)
Identification of trees, shrubs, vines, and ground covers used in landscape horticulture. Basic plant taxonomy, nomenclature, anatomy, and use of plants in the landscape. Diverse plant material covered with an emphasis on spring flowering trees and shrubs. Lec/rec.

HORT 251. TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS. (2 Credits)
Covers fruit and nut crops for temperate zones. Emphasis placed on scientific and common names, plant adaptation, basic morphology, major cultivars, and markets. Offered alternate years.

HORT 255. HERBACEOUS ORNAMENTAL PLANT MATERIALS. (3 Credits)
Identification and culture of herbaceous plants used in the landscape. Offered via Ecampus only.

HORT 260. ORGANIC FARMING AND GARDENING. (3 Credits)
Organic farming and gardening methods are discussed in class and practiced in the field. The philosophical background of organic farming as well as the biological, environmental and social factors involved in organic food production are covered. Emphasis is on hands-on application of scientific principles to create sustainable food production systems. Lec/lab.

HORT 270. INTRODUCTION TO THERAPEUTIC HORTICULTURE. (2 Credits)
An introduction to the history, benefits, and methods of therapeutic horticulture. Surveys program models for vocational, social/recreational, wellness and therapeutic applications of horticulture.

HORT 271. TECHNIQUES AND ADAPTIVE STRATEGIES IN THERAPEUTIC HORTICULTURE. (2 Credits)
An introduction to the characteristics of therapeutic gardens. Survey of year-round, indoor and outdoor therapeutic horticultural programming adaptations, strategies and techniques for different special populations.
Prerequisites: HORT 270 with D- or better

HORT 272. BASIC THERAPEUTIC SKILLS I. (2 Credits)
The assessment and evaluation process in therapeutic horticulture. Development of communication strategies, helping skills, and horticultural skills for therapeutic situations.
Prerequisites: HORT 271 with D- or better

HORT 273. BASIC THERAPEUTIC SKILLS II. (2 Credits)
Assessment and documentation tools in therapeutic horticulture. Treatment issues related to different types of physical and mental issues. Conduct and evaluate therapeutic horticultural activity sessions.
Prerequisites: HORT 272 with D- or better

HORT 274. THERAPEUTIC HORTICULTURAL PROGRAMS FOR OLDER ADULTS/CHILDREN. (2 Credits)
Benefits and applications of therapeutic horticulture to older adults and special needs children.
Prerequisites: HORT 273 with D- or better

HORT 275. THERAPEUTIC GARDEN DESIGN, MAINTENANCE AND PROGRAMMING. (2 Credits)
The history, characteristics and design of the therapeutic garden. The use of the garden in therapeutic horticultural programming.
Prerequisites: HORT 274 with D- or better and HORT 280 [D-]

HORT 283. INTRODUCTION TO URBAN AGRICULTURE. (3 Credits)
Focuses on the adaption of agricultural principles to the urban environment, specifically the production of plant crops. Topics include: (I) urban environments and infrastructure, (II) urban crop production practices, (III) urban markets and farm management. Exposes students to the breadth of items that they should consider in order to be a successful urban grower.
Recommended: General background or previous coursework in agriculture

HORT 285. PERMACULTURE DESIGN AND THEORY: CERTIFICATE COURSE. (4 Credits)
Permaculture design course meets internationally recognized standards for certification. Lectures, hands-on activities, experiential learning, group discussions, readings, student projects and presentations. Two mandatory weekend days. Design intensive, utilizing graphic and verbal presentation skills. Research into other functioning permaculture systems through literature, websites, and as observed on field trips. Lec/lab.
This course is repeatable for 8 credits.

HORT 299. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: HORT 299H
This course is repeatable for 16 credits.

HORT 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 299
This course is repeatable for 16 credits.
HORT 300. CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS. (4 Credits)
Relation of crop production to human culture and the natural environment. Origins of agriculture and the processes of agricultural change, and productivity and sustainability of specific crop production systems in the Pacific Northwest. History, geography, resource requirements, and key challenges faced are presented. Fundamental crop production practices in relation to productivity and sustainability. Lec/lab/rec. CROSSLISTED as CROP 300/HORT 300.
Equivalent to: CROP 300, CSS 300
Recommended: One year of general biology

HORT 301. GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS. (3 Credits)
Gain fundamental knowledge of plant growth and development of horticultural crops from a micro- to macro-level starting at double fertilization through fruit growth-covering seed-to-seed. The last section specifically examines how environmental factors affect growth and development. Lec/lab.
Recommended: General biology or botany sequence.

HORT 302. HORTICULTURAL PROJECTS. (2 Credits)
Student-managed crop production projects with emphasis on container grown, greenhouse crops. Crop scheduling, propagation and planting, selecting temperature and lighting regimes, specifying growth regulator applications, nutrient management, irrigation management, pest monitoring, and problem diagnosis and correction.
Recommended: HORT 301

HORT 303. ORGANIC SYSTEM PREDICAMENTS. (3 Credits)
Analyze controversial organic agriculture and systems issues while developing critical- and systems-thinking skills. Synthesis of information from diverse sources and application of scientific knowledge will be required to recommend possible solutions to real world organic agriculture predicaments.

HORT 304. INPUTS IN ORGANIC CROPPING SYSTEMS: SOURCING AND EFFICACY. (2 Credits)
Applied course focused on the regulation, sourcing, and efficacy of organic inputs including soil amendments, fertilizers, and pesticides. Gain experience using science-, practice-, and regulation-based information to source and determine effectiveness of inputs in certified organic cropping systems.
Prerequisites: HORT 212 with C- or better and CROP 355 [C-]

HORT 305. ORGANIC SYSTEM PREDICAMENTS. (3 Credits)
Analyze controversial organic agriculture and systems issues while developing critical- and systems-thinking skills. Synthesis of information from diverse sources and application of scientific knowledge will be required to recommend possible solutions to real world organic agriculture predicaments.

HORT 306. WEED MANAGEMENT IN ORGANIC CROPPING SYSTEMS. (3 Credits)
Applied organic weed identification and management course. Learn real-world application of science-, practice-, and regulation-based weed management information while designing and evaluating organic weed management plans for certified organic farming systems.

HORT 307. PRINCIPLES OF TURFGRASS MAINTENANCE. (4 Credits)
Identification and adaptation of common turfgrasses. Physiology of turfgrass growth and response to cultural and environmental stresses. Cultural practices including establishment, general maintenance, and pest control. Field trips required.
Recommended: (CSS 205 or CSS 305 or SOIL 205)

HORT 308. PLANT NUTRITION. (4 Credits)
Survey of ecological processes in managed ecosystems emphasizing ecological management techniques. Ecosystem services; biodiversity management; weed dynamics; agroecology; urban ecology; restoration and mitigation; landscape management. Field trip required. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

HORT 309. RESTORATION HORTICULTURE. (3 Credits)
As world population increases to some 9 billion plus by 2044, the importance of ecologically sound horticultural practices becomes increasingly apparent. Integration of ecological concepts and theory in management and development of created landscapes is critical for the preservation of many ecological services currently provided by undeveloped areas. Offered via Ecampus only.
Recommended: WR 121 with proficiency in writing skills and ability to communicate through writing. Basic ecology course or practical experience providing understanding of ecological principals and concepts

HORT 310. PLANT PROPAGATION. (3 Credits)
Plant propagation is the regeneration of plants using vegetative plant parts or seeds to maintain the desired genetic makeup. Theory and principles of horticultural and physiological concepts applicable for laboratory, greenhouse, nursery, field, and orchard propagators.
Prerequisites: HORT 301 with D- or better

HORT 311. PRINCIPLES OF TURFGRASS MAINTENANCE. (4 Credits)
The regeneration of plants from vegetative and reproductive tissue and organs. Horticultural and physiological principles, methods, and techniques for laboratory, greenhouse nursery, field, and orchard.
Recommended: HORT 301
HORT 344. INSECT AND DISEASE MANAGEMENT IN ORGANIC CROPPING SYSTEMS. (3 Credits)
A skills-based course on the science, practice, and regulations related to insect and disease management in organic cropping systems.
Prerequisites: BOT 350 with C- or better and ENT 311 [C]
This course is repeatable for 3 credits.

HORT 349. DIAGNOSING PLANT PROBLEMS. (3 Credits)
Basic principles of problem diagnosis in crop, garden, and landscape plants are covered. Problems caused by cultural and environmental issues, plant diseases, insect pests, and other causes are addressed. Students will gain familiarity with resources for plant problem diagnosis. Offered via UCampus only.
Recommended: Background in basic biology, plant pathology and/or entomology from a university or practical setting

HORT 350. URBAN FORESTRY. (3 Credits)
Introduction to principles and practices of planting and managing trees as a system of urban environment; understanding the economic, environmental, social aspects of urban forests, and an overview of contemporary land use issues and societal perspectives between people and plants. CROSSLISTED as FES 350/HORT 350.
Equivalent to: FES 350, FOR 350
Recommended: Foundational forestry and horticulture courses

HORT 351. FLORICULTURE AND GREENHOUSE SYSTEMS. (4 Credits)
For students interested in growing plants in commercial or educational greenhouses. Actively explores the production and scheduling of floriculture crops for various markets. Combines the practical aspects of growing floral crops under environments created by traditional and technologically advanced greenhouses. Greenhouse structures and crop environment manipulation will be emphasized. Students actively manage a floriculture crop and are responsible for developing and implementing production schedules, and for making key decisions on the culture of diverse floral crops.
Recommended: HORT 301

HORT 358. LANDSCAPE CONSTRUCTION TECHNIQUES. (4 Credits)
Study of landscape construction process from initial site analysis to finished landscape. Techniques used in building hardscape and landscape areas. Field trips required. Lec/lab.

HORT 360. IRRIGATION AND DRAINAGE. (4 Credits)
Familiarizes students with the principles and practices of irrigation and drainage systems. Optimum use of water, irrigation and drainage system design, installation, repairs, and troubleshooting are emphasized. Lec/lab.
Prerequisites: CSS 305 with D- or better or SOIL 205 with D- or better or (SOIL 205 with D- or better

HORT 361. PLANT NURSERY SYSTEMS. (4 Credits)
Covers how to grow shrubs and trees, and herbaceous annuals and perennials in nurseries for use in urban landscapes and managed ecosystems such as forestry and restoration. Plant nursery systems are diverse and require intensive management involving a dynamic decision making process. This course actively explores field and container production systems as well as the marketing of plants, an overview of plant growth regulation and post-production handling, the influence of efficient production practices on plant quality, integrating pest management strategies, and natural resource utilization.
Recommended: HORT 301

HORT 380. SUSTAINABLE LANDSCAPE DESIGN. (3 Credits)
The assessment of design problems/situations, the development of solutions and the communication of those solutions to the client through the design. Specific topics include designing for ecosystem maintenance/enhancement, introduction to computer-aided design (CAD), using color in landscape designs and rendering section/elevation views.

HORT 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: HORT 405H
This course is repeatable for 16 credits.

HORT 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 405
This course is repeatable for 16 credits.

HORT 406. PROJECTS: DATA PRESENTATIONS. (1 Credit)
For any student doing research, to learn to develop and evaluate poster and slide presentations containing scientific data. Students are exposed to a variety of scientific disciplines as they prepare and critique their own and other students' posters and oral presentations. Students improve written and oral communication skills. Letter grade is based on participation, improvement, and the quality of a final poster project and oral presentation. Offered winter term. CROSSLISTED as BRR 406/ HORT 406.
Equivalent to: BRR 406

HORT 407. SEMINAR. (1 Credit)
Senior seminar intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and to attend and evaluate the seminars given by other class members.

HORT 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 410. INTERNSHIP. (1-12 Credits)
Work internship to acquaint horticulture majors with the practices of the horticulture industry. Under direction of departmental internship committee. Requires approved statement of intent, submission of employer and employee evaluation forms and written report. This course is repeatable for 12 credits.

HORT 411. HORTICULTURE BOOK CLUB. (1 Credit)
Reading and discussion of noteworthy books and associated topics relating to agriculture, society and the environment.
This course is repeatable for 2 credits.
HORT 412. CAREER EXPLORATION: INTERNSHIPS AND RESEARCH PROJECTS. (1 Credit)
Provides orientation to the horticulture major internship and research project requirement. Covers procedures for selecting, performing, and reporting on an internship or research project. Includes guidance and skill development valuable in the pursuit of horticultural career goals, such as cover letter and resume preparation and interviewing experience.

HORT 414. PRECISION AGRICULTURE. (4 Credits)
Provides insight into the technology available to support precision agriculture and data management planning applications. Examines the concepts and applications of precision agriculture to teach practical use of hardware, equipment and software. An overview of current technology including autonomous vehicles, GPS, soil and crop proximal sensors, imagery and mapping, variable rate control systems, and yield monitors.
Equivalent to: CROP 414/HORT 414

HORT 418. GOLF COURSE MAINTENANCE. (4 Credits)
Basic aspects of golf course maintenance under temperate zone conditions. Lec/lab.
Recommended: HORT 314

HORT 421. HERBS, SPICES, AND MEDICINAL PLANTS. (3 Credits)
Principles of crop ecology, morphology, chemistry and utilization of natural products of herbs, spices, and medicinal plants (HSMP). Examines the history and importance of HSMP, their historic and modern uses, current market trends, botany, collection in the wild, fundamentals of production systems for HSMP, harvesting, drying, and other postharvest operations, natural products and their uses, regulations and legal concerns of herbal products.
Recommended: CROP 200 or equivalent horticulture course

HORT 433. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years.
CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Prerequisites: BI 102 with D- or better or BI 213 with D- or better or BI 311 with D- or better or HORT 430 with D- or better or CSS 430 with D- or better or HORT 450 with D- or better or CSS 450 with D- or better or PBG 450 with D- or better
Equivalent to: CROP 433, HORT 233

HORT 444. INSECT AGROECOLOGY. (3 Credits)
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape.
CROSSLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: ENT 444
Recommended: General background or previous course work in entomology.

HORT 447. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: FES 447, FOR 447
Recommended: (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

HORT 451. TREE FRUIT PHYSIOLOGY AND CULTURE. (4 Credits)
Plant growth and development in relation to tree fruit production; emphasis on canopy development and pruning theory, flowering and fruit set, and development, dormancy, and cold acclimation. Field trips required.
Recommended: Completion or concurrent enrollment in HORT 301 and BOT 331

HORT 452. BERRY AND GRAPE PHYSIOLOGY AND CULTURE. (4 Credits)
Production of wine grapes, caneberries, strawberries, blueberries, and other miscellaneous berry crops. Emphasis on plant growth and development; pruning and training systems; flower and fruit development and cultivars. Field trips required. Offered in alternate years.
Recommended: HORT 301

HORT 453. GRAPEVINE GROWTH AND PHYSIOLOGY. (3 Credits)
The physiological aspects of grapevine growth and development including dormancy, flowering and fruit set, vegetative growth, fruit development and water relations. Additional topics include taxonomy, morphology and physiological influences of vineyard mesoclimate and vine microclimate. Lec/lab.
Prerequisites: HORT 301 with C- or better
Recommended: HORT 301

HORT 454. PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION. (3 Credits)
The relationship of vineyard and canopy management to grapevine physiology and fruit quality. Nutrient/water relations within the soil/vine continuum. Vineyard microclimate, floor management, and pests will also be discussed. Lec/lab.
Prerequisites: HORT 301 with D- or better
Recommended: Completion or concurrent enrollment in HORT 453

HORT 455. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FES 455, FOR 455
Recommended: FES 350 or FOR 350 or HORT 350

HORT 456. PHYSIOLOGY AND PRODUCTION OF BERRY CROPS. (4 Credits)
Physiology and production systems of blueberries, red and black raspberries, blackberries, and other berry crops. Emphasis on plant growth and development; flower and fruit development; cultivars; pruning and training systems; irrigation; harvesting; nutrient management; and conventional and organic production systems.
Prerequisites: HORT 301 with D- or better

HORT 463. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: CROP 463, HORT 363
HORT 480. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: CROP 480
Prerequisites: HORT 300 or HORT 300

HORT 481. HORTICULTURE PRODUCTION CASE STUDIES. (4 Credits)
Field-based case studies investigate production issues encountered in horticultural crops; individual and group activities; discussion of processes for troubleshooting, decision-making and management recommendations; assessment of economic, practical and logistical feasibility. Prior knowledge of plant physiology, soils, entomology, and plant nutrition are required. Multiple field trips required. A field trip fee will be charged.
Prerequisites: HORT 301 with D- or better

HORT 482. DESIGN AND MANAGEMENT OF ORGANIC CROPPING SYSTEMS. (3 Credits)
This capstone course is the final stage of the Organic Farming Systems Certificate Program. Iteratively design and evaluate organic farming system management plans. Apply real-world science-, practice-, and regulation-based information to the design and management of organic farming systems.
Prerequisites: HORT 212 with C- or better and CROP 355 [C-] and HORT 306 (may be taken concurrently) [C-] and HORT 307 (may be taken concurrently) [C-] and HORT 308 (may be taken concurrently) [C-] and HORT 344 (may be taken concurrently) [C-] and SOIL 360 (may be taken concurrently) [C-]

HORT 483. CASE STUDIES IN URBAN AGRICULTURE. (3 Credits)
Provides an overview of the diversity of endeavors that are available to potential urban agriculturists. These include urban and peri-urban farms (for profit and non-profit), community and school gardens, controlled climate facilities, rooftop farms and gardens, and more. For each case study, we will specifically examine: (1) the market where the farmer sells goods, (2) methods of achieving growth, particularly while avoiding debt, (3) increasing livelihood reliance upon on-farm income.
Recommended: General background or previous coursework in agriculture

HORT 485. ADVANCED PERMACULTURE DESIGN TOOLS FOR CLIMATE RESILIENCE. (3 Credits)
Permaculture is a design system for creating sustainable human habitation that enriches the natural world. With climate change, geophysical and social conditions are shifting on the planet. There are specific tools that the permaculture designer can use to assess, analyze and project future climate scenarios and respond to them with resilient design. Climate analogue identification and climate change forecasting provide the basis for a student design project that addresses current and future climatic conditions. Students will complete all design mapping assignments using Google Earth Pro, and tutorials will be provided as a component of the course curriculum.
Prerequisites: HORT 285 with B or better

HORT 495. HORTICULTURAL MANAGEMENT PLANS. (3 Credits)
Develop an integrated management plan for a horticultural enterprise. This course is repeatable for 6 credits.

HORT 499H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: HORT 499H
Attributes: HNRS – Honors Course Designator

HORT 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

HORT 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 510. INTERNSHIP. (1-12 Credits)
Offered via Ecampus only. This course is repeatable for 12 credits.

HORT 511. RESEARCH AND EDUCATIONAL PERSPECTIVES IN HORTICULTURE. (2 Credits)
Introduces beginning graduate students to the faculty in horticulture and provides an in-depth discussion of their research and education programs.

HORT 518. CURRENT TOPICS IN ENTOMOLOGY. (2 Credits)
A core course of the Horticulture graduate program. Provides an advanced understanding of entomology and its relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as ENT 518/HORT 518.
Equivalent to: ENT 518
This course is repeatable for 12 credits.

HORT 519. CURRENT TOPICS IN PLANT BREEDING AND GENETICS. (2 Credits)
Provides an advanced understanding of plant breeding and genetics and their relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as HORT 519/PBG 519.
Equivalent to: PBG 519
This course is repeatable for 12 credits.

HORT 520. CURRENT TOPICS IN HORTICULTURAL RESEARCH. (2 Credits)
This is a core course in the horticulture graduate program. Students gain an advanced understanding of horticulture science and its relationship to other disciplines through critical analysis of the scientific literature. Students practice synthesizing information and presenting findings to their peers. Instructors, topics and specific learning objectives vary from term to term.
This course is repeatable for 12 credits.
HORT 521. HERBS, SPICES, AND MEDICINAL PLANTS. (3 Credits)
Principles of crop ecology, morphology, chemistry and utilization of natural products of herbs, spices, and medicinal plants (HSMP). Examines the history and importance of HSMP; their historic and modern uses, current market trends, botany, collection in the wild, fundamentals of production systems for HSMP; harvesting, drying, and other postharvest operations, natural products and their uses, regulations and legal concerns of herbal products.
Recommended: CROP 200 or equivalent course in HORT.

HORT 533. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years. CROSSTLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Equivalent to: CROP 533
Recommended: BI 102 or BI 213 or BI 311 or HORT 430 or CSS 430 or HORT 450 or CSS 450

HORT 540. ORGANIC VEGETABLE PRODUCTION SYSTEMS: DESIGN AND MANAGEMENT. (3 Credits)
Design, management, and troubleshooting in organic vegetable production systems. Students learn to integrate knowledge from various technical disciplines and explore the social, economic, and environmental dimensions of vegetable production to analyze and evaluate organic vegetable farm enterprises.
Recommended: CROP/SOIL 530 and ENT 548

HORT 544. INSECT AGROECOLOGY. (3 Credits)
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape. CROSSTLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: ENT 544
Recommended: General background or previous course work in entomology.

HORT 547. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSTLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: FES 547

HORT 552. BERRY AND GRAPE PHYSIOLOGY AND CULTURE. (4 Credits)
Production of wine grapes, caneberries, strawberries, blueberries, and other miscellaneous berry crops. Emphasis on plant growth and development; pruning and training systems; flower and fruit development and cultivars. Field trips required. Offered in alternate years.
Recommended: HORT 301

HORT 555. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSTLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FES 555, FOR 555
Recommended: FOR 350 or FES 350 or HORT 350

HORT 556. PHYSIOLOGY AND PRODUCTION OF BERRY CROPS. (4 Credits)
Physiology and production systems of blueberries, red and black raspberries, blackberries, and other berry crops. Emphasis on plant growth and development; flower and fruit development; cultivars; pruning and training systems; irrigation; harvesting; nutrient management; and conventional and organic production systems.

HORT 563. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endospem development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSTLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: CROP 563, HORT 363

HORT 580. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSTLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: CROP 580
Recommended: CROP 300 or HORT 300

HORT 581. HORTICULTURE PRODUCTION CASE STUDIES. (4 Credits)
Field-based case studies investigate production issues encountered in horticultural crops; individual and group activities; discussion of processes for troubleshooting, decision-making and management recommendations; assessment of economic, practical and logistical feasibility. Prior knowledge of plant physiology, soils, entomology, and plant nutrition are required. Multiple field trips required. A field trip fee will be charged.
Recommended: HORT 301

HORT 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

HORT 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

HORT 605. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Horticulture Graduate Major (MS, PhD)
The Department of Horticulture offers graduate work leading to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees. The MS and PhD degrees culminate in original research reported in a thesis and
are often pursued by students interested in research related careers, or who wish direct training in research methods.

The Department of Horticulture has strengths and expertise in:

**Breeding, Genetics, and Biotechnology.** Faculty and students explore fundamental questions related to the control and regulation of plant traits using a variety of techniques and tools including molecular biology, genomics and bioinformatics. Faculty and students also apply fundamental knowledge to make genetic improvements to crop plants and to modify plant growth and productivity. Current breeding programs exist in berry, hazelnut and vegetable systems.

**Sustainable Crop Production.** Faculty and students explore basic and applied questions related to the design and management of sustainable and productive horticultural cropping and farming systems. The program integrates a diverse set of disciplines and tools including basic plant sciences, applied crop management, and field experimentation and analysis. Program areas include viticulture and enology, berries and small fruit, tree fruit and nuts, vegetables, nursery and greenhouse production, and entomology.

**Community and Landscape Horticultural Systems.** Faculty and students explore basic and applied questions related to the design and function of urban and community landscapes including golf courses, sports fields, gardens, parks and open space. Program areas include turf and landscape management, community food systems, pollinator ecology, sustainable landscapes, and entomology.

For more information, visit our website (http://horticulture.oregonstate.edu), contact a member of the graduate faculty, or contact John Lambinos, Graduate Coordinator, Department of Horticulture, 4017 Agricultural and Life Sciences Building, OSU, Corvallis, OR 97331-7304, email: john.lambinos@oregonstate.edu

**Entomology Graduate Option**

**This option is offered within the following major(s):**

- Crop Science - College of Agricultural Sciences (p. 126)
- Horticulture - College of Agricultural Sciences (p. 174)

The Entomology (ENT) option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is a collaborative discipline spanning everything from classical field approaches to gene manipulation at the molecular level. Breeders regularly cooperate with pathologists, entomologists, soil scientists, physiologists, food scientists, geneticists, molecular biologists and experts in other fields.

Students in the Entomology option will conduct thesis research related to insects under the supervision of an entomologist associated with the graduate faculty in Crops or Horticulture, and take courses that provide knowledge and understanding about insects. After completing their degree, students will have gained fundamental knowledge in entomology that may be applied in agricultural, aquatic, forested, natural, and urban environments.

**Option Code: 5333**

### Total Hours 12

#### Thesis Credits

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ENT 503</td>
<td>THESIS</td>
<td>3</td>
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#### Course Credits

Select 9 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 507</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>ENT 520</td>
<td>INSECT ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>ENT 540</td>
<td>ISSUES IN INSECT TOXICOLOGY</td>
<td></td>
</tr>
<tr>
<td>ENT 599</td>
<td>SPECIAL TOPICS</td>
<td></td>
</tr>
<tr>
<td>IB 540</td>
<td>INSECT PHYSIOLOGY</td>
<td></td>
</tr>
<tr>
<td>IB 577</td>
<td>AQUATIC ENTOMOLOGY</td>
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</table>

**Option Code: 5333**

### Plant Breeding and Genetics Graduate Option

**This option is offered within the following major(s):**

- Crop Science - College of Agricultural Sciences (p. 126)
- Horticulture - College of Agricultural Sciences (p. 174)

The Plant Breeding and Genetics (PBG) graduate option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is an interdisciplinary approach to applied plant breeding by taking courses across a broad spectrum of disciplines. The option may be tailored to meet students’ career goals including further graduate study, as well as direct entry into public or private sector breeding programs. After completing the degree, students will have the fundamental knowledge of plant breeding that may be applied to a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products.

**Option Code: 1210**

**Select 12 credits of the following:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 575/MCB 575</td>
<td>COMPARATIVE GENOMICS</td>
<td></td>
</tr>
<tr>
<td>CROP 590</td>
<td>EXPERIMENTAL DESIGN IN AGRICULTURE</td>
<td></td>
</tr>
<tr>
<td>PBG 507</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>PBG 519/HORT 519</td>
<td>CURRENT TOPICS IN PLANT BREEDING AND GENETICS</td>
<td></td>
</tr>
<tr>
<td>PBG 530</td>
<td>PLANT GENETICS</td>
<td></td>
</tr>
<tr>
<td>PBG 541/MCB 541</td>
<td>PLANT TISSUE CULTURE</td>
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<tr>
<td>PBG 550</td>
<td>PLANT BREEDING</td>
<td></td>
</tr>
<tr>
<td>PBG 620/MCB 620</td>
<td>DNA FINGERPRINTING</td>
<td></td>
</tr>
<tr>
<td>PBG 621/MCB 621</td>
<td>GENETIC MAPPING</td>
<td></td>
</tr>
<tr>
<td>PBG 622/MCB 622</td>
<td>MAPPING QUANTITATIVE TRAIT LOCI</td>
<td></td>
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</tbody>
</table>
Horticulture Graduate Minor

Minor Code: 1450

Horticulture Minor

Also available via Ecampus.

The Horticulture minor is an effective way for students, including majors outside the College of Agricultural Sciences, to meet their interests. The goals of students minoring in horticulture may vary widely. With just five credits in the minor core, students will be able to tailor their additional horticulture coursework to personal goals.

Minor Code: 145

Students are required to earn a grade of C− or better in all HORT and PBG courses taken to complete the minor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 112</td>
<td>INTRODUCTION TO HORTICULTURAL SYSTEMS, PRACTICES AND CAREERS</td>
<td>2</td>
</tr>
<tr>
<td>HORT 301</td>
<td>GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS</td>
<td>3</td>
</tr>
<tr>
<td>Select 22 additional HORT credits (at least 10 must be upper division)</td>
<td>22</td>
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</table>

Total Hours: 27

1 Course selection must be approved by the departmental academic advisor.

Minor Code: 145

Horticulture Undergraduate Major (BS, HBS)

Also available via Ecampus.

Major Code: 145

Grade Requirements for Horticulture Major

Students pursuing a major in horticulture are required to receive a grade of C− or better in all HORT (horticulture) and PBG (plant breeding and genetics) courses that are required for completion of their major and option. If a grade below C− is received in a HORT or PBG course required for their major and option a student will need to re-take the course and receive a grade of C− or better. If the grade below a C− was received for a course that is part of a group of courses where the student can select which courses to take (i.e., they do not need to take all of the courses, just a specified number of courses or credits) then it would be acceptable for the student to substitute a course for the one that they had received a grade below a C−. For example, in most of our options, a student needs to complete three of four plant identification courses. If a student received a grade lower than a C− in one of the classes, they could either re-take the same course or complete the other three courses with a grade of C− or better.

Grade Requirements for Horticulture Major – Plant Breeding and Genetics Option

Students pursuing an option in Plant Breeding and Genetics, under the Horticulture Major, and under the Crop and Soil Science Major, are required to receive a grade of C− or better in all BOT, CROP, CSS, FOR, HORT, MB, PBG, SOIL and ST courses required within their major and option.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Bi 211</td>
<td>*PRINCIPLES OF BIOLOGY (required for Horticultural Research option)</td>
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</tr>
<tr>
<td>Bi 212</td>
<td>*PRINCIPLES OF BIOLOGY (required for Horticultural Research option)</td>
<td></td>
</tr>
<tr>
<td>Bi 213</td>
<td>*PRINCIPLES OF BIOLOGY (required for Horticultural Research option)</td>
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Select one of the following:

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
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</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
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</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>CH 122</td>
<td>*GENERAL CHEMISTRY</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
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<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
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<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
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<tr>
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<tbody>
<tr>
<td>MTH 112</td>
<td>ELEMENTARY FUNCTIONS</td>
<td></td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS (required for Horticultural Research option)</td>
<td></td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS (Plant Breeding and Genetics option already requires ST 351 — students in that option will need to choose from one of the above selection of math courses to fulfill this requirement.)</td>
<td></td>
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</table>

Agricultural Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
<td></td>
</tr>
<tr>
<td>BOT 350</td>
<td>INTRODUCTORY PLANT PATHOLOGY</td>
<td></td>
</tr>
<tr>
<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
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Select one of the following:

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>&amp; SOIL 206</td>
<td>*SOIL SCIENCE LABORATORY FOR SOIL 205</td>
<td></td>
</tr>
</tbody>
</table>
Ecological Management of Turf, Landscape and Urban Horticulture Option

This option is offered within the following major(s):

- Horticulture - College of Agricultural Sciences (p. 176)

The turf, landscape, and urban horticulture industries are large and diverse, offering careers in golf course and athletic field management; landscape design, construction, management, and ecological restoration; conservation; park, botanical, and public garden management; urban forestry policy and management; research; and consulting.

Turf is the central feature of golf courses, sports fields, parks, cemeteries, and landscapes in cities and neighborhoods throughout the United States. Professional lawn care is a thriving industry in Oregon communities that is complimented by a vibrant sports turf and grass seed industry. This continually growing industry offers more career track jobs than any other area in horticulture.

Students in turf management become golf course superintendents, athletic field and park managers, and lawn care professionals. The program focuses on science, technology, ‘in-field’ hands-on experience, and decision making in real-world settings. Activities stress networking and exposure to multiple work environments to help students integrate quickly into the industry.

In the landscape and urban horticulture program, students will learn about sustainable landscape management, urban forestry, and the ecosystem services provided by the built environment, such as carbon sequestration and climate regulation, temperature modulation, waste decomposition and detoxification, purification of water and air, storm and rainwater management, crop pollination, pest and disease control, nutrient dispersal and cycling, seed dispersal, intellectual and spiritual inspiration, recreational experiences, and scientific discovery.

Landscape professionals design, build, and manage aesthetically pleasing, functional, and environmentally responsible natural spaces where we all live, work, and play. In recent years, the industry has expanded and rapidly become more sophisticated to meet the challenges of today’s urban environment. Consequently, there is great demand for creative, motivated individuals who love the outdoors and enjoy working with plants, soil, water, nature, and people.

**Option Code: 792**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>HORT 225</td>
<td>LANDSCAPE PLANT MATERIALS II: DECIDUOUS HARDWOODS AND CONIFERS</td>
<td>4</td>
</tr>
<tr>
<td>HORT 226</td>
<td>LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS</td>
<td>4</td>
</tr>
<tr>
<td>BOT 313</td>
<td>PLANT STRUCTURE</td>
<td>3</td>
</tr>
<tr>
<td>BOT 321</td>
<td>PLANT SYSTEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>BOT 323</td>
<td>*FLOWERING PLANTS OF THE WORLD</td>
<td>3</td>
</tr>
<tr>
<td>BOT 425</td>
<td>FLORA OF THE PACIFIC NORTHWEST</td>
<td>3</td>
</tr>
<tr>
<td>FES 241</td>
<td>DENDROLOGY</td>
<td>3</td>
</tr>
<tr>
<td>HORT 251</td>
<td>TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS</td>
<td>3</td>
</tr>
<tr>
<td>HORT 255</td>
<td>HERBACEOUS ORNAMENTAL PLANT MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>HORT 433/CROP 433</td>
<td>SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS</td>
<td>3</td>
</tr>
<tr>
<td>RNG 353</td>
<td>WILDLAND PLANT IDENTIFICATION</td>
<td>3</td>
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**Ecology**

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>HORT 318</td>
<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
<td>3</td>
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**Technology**

<table>
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<tbody>
<tr>
<td>AG 312</td>
<td>ENGINE THEORY AND OPERATION</td>
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<tr>
<td>FW 303</td>
<td>SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE</td>
<td>3</td>
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<tr>
<td>GEOG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
<td>3</td>
</tr>
<tr>
<td>HORT 380</td>
<td>SUSTAINABLE LANDSCAPE DESIGN</td>
<td>3</td>
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**Horticultural Communication**

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>HORT 318</td>
<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>HORT 407</td>
<td>SEMINAR</td>
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<tr>
<td>HORT 411</td>
<td>HORTICULTURE BOOK CLUB</td>
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**Capstone**

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<th>Hours</th>
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<tbody>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
<td>4</td>
</tr>
<tr>
<td>HORT 418</td>
<td>GOLF COURSE MAINTENANCE</td>
<td>4</td>
</tr>
<tr>
<td>HORT 455/FES 445</td>
<td>URBAN FOREST PLANNING, POLICY AND MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>HORT 481</td>
<td>HORTICULTURE PRODUCTION CASE STUDIES</td>
<td>4</td>
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**Science and Technology of Managed Ecosystems**

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GEOG 340</td>
<td>*INTRODUCTION TO WATER SCIENCE AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>HORT 314</td>
<td>PRINCIPLES OF TURFGRASS MAINTENANCE</td>
<td>4</td>
</tr>
<tr>
<td>HORT 315</td>
<td>SUSTAINABLE LANDSCAPES: MAINTENANCE, CONSERVATION, RESTORE</td>
<td>4</td>
</tr>
<tr>
<td>HORT 358</td>
<td>LANDSCAPE CONSTRUCTION TECHNIQUES</td>
<td>4</td>
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<tr>
<td>HORT 360</td>
<td>IRRIGATION AND DRAINAGE</td>
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Select 2 of the following courses, minimum 6 credits:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 390</td>
<td>*HUMAN IMPACTS ON ECOSYSTEMS</td>
<td>6</td>
</tr>
<tr>
<td>BOT 488</td>
<td>ENVIRONMENTAL PHYSIOLOGY OF PLANTS</td>
<td>6</td>
</tr>
</tbody>
</table>
The online General Horticulture option curriculum is built on a strong foundation in horticultural science. This option is especially recommended for students already working in the horticultural industry or research facilities, whose careers will benefit from post-secondary education in the horticultural sciences. Students learn horticultural principles and practices associated with horticultural production within the context of plant biology, pest management, soils, ecology, and economics with applications in plant nutrition, pest management, business, and marketing. In addition, students are well-informed about the latest technology and trends in the field. The option provides sufficiently broad electives for the student to build their curriculum to meet specific goals.

Our graduates are skilled in finding and using information, as well as synthesizing information from many sources to solve problems. On-campus students benefit from field and lab experiences, research facilities, whose careers will benefit from post-secondary education. This option is especially recommended for students already working in the horticultural industry or research facilities, whose careers will benefit from post-secondary education in the horticultural sciences. Students learn horticultural principles and practices associated with horticultural production within the context of plant biology, pest management, soils, ecology, and economics with applications in plant nutrition, pest management, business, and marketing. In addition, students are well-informed about the latest technology and trends in the field. The option provides sufficiently broad electives for the student to build their curriculum to meet specific goals.
purchase and receive by mail; others will be virtual lab experiences created collaboratively between Department of Horticulture faculty and the curriculum design team in Ecampus.

The internship provides professional-level interaction with growers, managers, field reps, and consultants, and provides hands-on experience. Similarly, the research project familiarizes students with research topics and connects them with researchers in academia, public agencies, and private industry. Mentoring and advising will assist online students in taking advantage of departmental strengths.

Option Code: 240

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td></td>
<td><strong>Plant Materials</strong></td>
<td>10-12</td>
</tr>
<tr>
<td>BOT 220</td>
<td>*INTRODUCTION TO PLANT BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>BOT 440</td>
<td>FIELD METHODS IN PLANT ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
<td></td>
</tr>
<tr>
<td>HORT 226</td>
<td>LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS</td>
<td></td>
</tr>
<tr>
<td>HORT 228</td>
<td>LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING TREES AND SHRUBS</td>
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</tr>
<tr>
<td>HORT 255</td>
<td>HERBACEOUS ORNAMENTAL PLANT MATERIALS</td>
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<tr>
<td>RNG 353</td>
<td>WILDLAND PLANT IDENTIFICATION</td>
<td></td>
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<td></td>
<td><strong>Horticultural Production and Management</strong></td>
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<tr>
<td>CROP 310</td>
<td>FORAGE PRODUCTION</td>
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<tr>
<td>CROP 420</td>
<td>SEED SCIENCE AND TECHNOLOGY</td>
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<tr>
<td>CROP 460</td>
<td>SEED PRODUCTION</td>
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<tr>
<td>ENT 322</td>
<td>HONEY BEE BIOLOGY AND BEEKEEPING</td>
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<tr>
<td>ENT 440</td>
<td>ISSUES IN INSECT TOXICOLOGY</td>
<td></td>
</tr>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
<td></td>
</tr>
<tr>
<td>HORT 260</td>
<td>ORGANIC FARMING AND GARDENING</td>
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<tr>
<td>HORT 285</td>
<td>PERMACULTURE DESIGN AND THEORY: CERTIFICATE COURSE</td>
<td></td>
</tr>
<tr>
<td>HORT 314</td>
<td>PRINCIPLES OF TURFGRASS MAINTENANCE</td>
<td></td>
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<tr>
<td>HORT 315</td>
<td>SUSTAINABLE LANDSCAPES: MAINTENANCE, CONSERVATION, RESTORE</td>
<td></td>
</tr>
<tr>
<td>HORT 319</td>
<td>RESTORATION HORTICULTURE</td>
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</tr>
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<td>HORT 349</td>
<td>DIAGNOSING PLANT PROBLEMS</td>
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<td>HORT 350/FES 350</td>
<td>URBAN FORESTRY</td>
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<td>HORT 421</td>
<td>HERBS, SPICES, AND MEDICINAL PLANTS</td>
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<td>HORT 456</td>
<td>PHYSIOLOGY AND PRODUCTION OF BERRY CROPS</td>
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<td>HORT 485</td>
<td>ADVANCED PERMACULTURE DESIGN TOOLS FOR CLIMATE RESILIENCE</td>
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<td>PBG 450</td>
<td>PLANT BREEDING</td>
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<td>SOIL SYSTEMS AND PLANT GROWTH</td>
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<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
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<td>AG 312</td>
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<td>AG 412</td>
<td>AG SAFETY AND HEALTH</td>
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<td>SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE</td>
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<td>GEOG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
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<td>HORT 414/CROP 414</td>
<td>PRECISION AGRICULTURE</td>
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Capstone

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<td>HORT 300/CROP 300</td>
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<td>HORTICULTURE PRODUCTION CASE STUDIES</td>
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Business Management

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<td>BA 260</td>
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Government and Policy

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<td>INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE</td>
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<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
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<td>*STATE AND LOCAL POLITICS</td>
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<td>GLOBAL FOOD POLITICS AND POLICY</td>
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<td>PS 475</td>
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Ecology and Sustainability

Ecosystems Courses

Select courses that meet Synthesis requirements. Each course must be from a different department.

Contemporary Global Issues

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<td>CROP 330</td>
<td>WORLD FOOD CROPS</td>
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<td>FES 365</td>
<td>*ISSUES IN NATURAL RESOURCES CONSERVATION</td>
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<td>FW 325</td>
<td>*GLOBAL CRISIS IN RESOURCE ECOLOGY</td>
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<td>GEOG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
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<td>GEOG 330</td>
<td>**GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
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<td>HORT 331/ENT 331</td>
<td>POLLINATORS IN PERIL</td>
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<td>SUS 350</td>
<td>*SUSTAINABLE COMMUNITIES</td>
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<td>WSE 470</td>
<td>*FORESTS, WOOD AND CIVILIZATION</td>
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Science, Technology and Society

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<td>*CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE</td>
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<tr>
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<td>*HUMAN ECOLOGY</td>
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<td>BOT 324</td>
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<td>CH 374</td>
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<td>*ENERGY MATTERS</td>
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<td>FES 435/TOX 435</td>
<td>GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
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<td>FES 477/NR 477</td>
<td>AGROFORESTRY</td>
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<td>FES 485</td>
<td>*CONSSENSUS AND NATURAL RESOURCES</td>
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<td>FST 421</td>
<td>*FOOD LAW</td>
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</table>
Horticultural Research Option

This option is offered within the following major(s):

• Horticulture - College of Agricultural Sciences (p. 176)

The Horticultural Research option is designed for students interested in graduate school and a career in academic or industrial research. It provides an excellent foundation in the natural sciences and horticulture and accommodates the specific interests of each student. Graduates of this program will be critical thinkers, and experienced technical communicators. They will be skilled in finding and using information, as well as synthesizing information from many sources to analyze novel situations and solve problems.

The relationship between the student and the research mentor is a key feature of this program. The mentor will assist the student in choosing upper-division classes that match the student's interests. Each student
also completes a research project under the guidance of their mentor and writes an undergraduate thesis. Students can work with horticulture researchers on the OSU campus or at research institutions of their choosing. Our undergraduates have been welcomed at other universities and at local research institutions including the United States Department of Agriculture-Agricultural Research Service laboratories, the National Clonal Germplasm Repository in Corvallis, the Corvallis Plant Materials Center of the National Resources Conservation Service, and the North Willamette Research and Extension Center.

**Option Code: 614**

In addition to the required Horticulture major Core courses, students in this proposed option will complete the following courses:

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<th>Hours</th>
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<td>BOT 321</td>
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<td>BOT 425</td>
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<td>CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
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<td>FES 241</td>
<td>DENDROLOGY</td>
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<td>HORT 226</td>
<td>LANDSCAPE PLANT MATERIALS I: DECIDUOUS</td>
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<tr>
<td>HORT 228</td>
<td>LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING</td>
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<td>HORT 251</td>
<td>TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS</td>
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<td>HERBACEOUS ORNAMENTAL PLANT MATERIALS</td>
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<td>HORT 433/CROP 433</td>
<td>SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS</td>
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<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
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<td>GRAPEVINE GROWTH AND PHYSIOLOGY</td>
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<td>PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION</td>
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Select 3 of the following courses:

- BB 350  ELEMENTARY BIOCHEMISTRY
- CH 331  ORGANIC CHEMISTRY
- CH 332  ORGANIC CHEMISTRY
- PH 201  *GENERAL PHYSICS
- PH 202  *GENERAL PHYSICS

Select 12 credits of upper-division Horticulture and Life Science courses with approval of research mentor and advisor

**Ecology and Sustainability Ecosystems Courses**

Meets Synthesis requirements. Each course must be from a different department.

**Contemporary Global Issues**

Select one of the following: 3-4

- AEC 351  *NATURAL RESOURCE ECONOMICS AND POLICY
- AEC 352/ECON 352  *ENVIRONMENTAL ECONOMICS AND POLICY
- BI 301  *HUMAN IMPACTS ON ECOSYSTEMS
- CROP 330  *WORLD FOOD CROPS
- FES 365  *ISSUES IN NATURAL RESOURCES CONSERVATION
- FW 325  *GLOBAL CRISIS IN RESOURCE ECOLOGY
- GEOG 300  *SUSTAINABILITY FOR THE COMMON GOOD
- GEOG 430  **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION
- HORT 331/ENT 331  *POLLINATORS IN PERIL
- SUS 350  *SUSTAINABLE COMMUNITIES
- WSE 470  *FORESTS, WOOD AND CIVILIZATION
- Z 349  *BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION

**Science, Technology and Society**

Select one of the following: 3-4

- AGRI 411  *INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL
- ANS 315  *CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE
- BI 348  *HUMAN ECOLOGY
- BOT 324  *FUNGI IN SOCIETY
- CH 374  *TECHNOLOGY, ENERGY, AND RISK
- ENGR 350  *SUSTAINABLE ENGINEERING
- ENGR 363  *ENERGY MATTERS
- ENSC 479  **ENVIRONMENTAL CASE STUDIES
- FES 435/TOX 435  *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
- FES 477/NR 477  *AGROFORESTRY
- FES 485  *CONSENSUS AND NATURAL RESOURCES
- FST 421  *FOOD LAW
- FW 470  *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN
- GEOG 300  *SUSTAINABILITY FOR THE COMMON GOOD
- GEOG 340  *INTRODUCTION TO WATER SCIENCE AND POLICY
- HORT 330/ENT 330  *PLAGUES, PESTS, AND POLITICS
- HST 481  *ENVIRONMENTAL HISTORY OF THE UNITED STATES
- HSTS 421  *TECHNOLOGY AND CHANGE
- NUTR 312  *ISSUES IN NUTRITION AND HEALTH
- PH 313  *ENERGY ALTERNATIVES
- PHL 325  *SCIENTIFIC REASONING
- PS 476  *SCIENCE AND POLITICS
- SOIL 395  **WORLD SOIL RESOURCES
- SUS 304  *SUSTAINABILITY ASSESSMENT

Total Hours 51-57

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
### Plant Breeding and Genetics Option

This option is offered within the following major(s):

- Crop and Soil Science - College of Agricultural Sciences (p. 121)
- Horticulture - College of Agricultural Sciences (p. 176)

The Plant Breeding and Genetics (PBG) option at Oregon State University embodies the Land Grant mission of integrated research, teaching and extension in the context of cultivar development and fundamental genetics. Plant breeding is a collaborative discipline spanning everything from classical field approaches to gene manipulation at the molecular level. Breeders regularly cooperate with pathologists, entomologists, soil scientists, physiologists, food scientists, genomicists, molecular biologists and experts in other fields.

Students in the Plant Breeding and Genetics option will learn an interdisciplinary approach to applied plant breeding by taking courses across a broad spectrum of disciplines. The option may be tailored to meet students’ career goals including graduate school, as well as directly entering public or private sector breeding programs. After completing their degree, students will have gained fundamental knowledge in plant breeding that may be applied in a range of crops including annual and perennial horticultural crops, agronomic food and feed crops, and forestry products.

This option is under both the Crop and Soil Science major and the Horticulture major. The option uses the new horticulture major core.

#### Option Code: 785

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**Plant Materials**

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<td>SEED PRODUCTION</td>
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<td>PRINCIPLES OF POTATO PRODUCTION</td>
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<td>ORGANIC FARMING AND GARDENING</td>
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<td>FLORICULTURE AND GREENHOUSE SYSTEMS</td>
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<td>IRRIGATION AND DRAINAGE</td>
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<td>PLANT NURSERY SYSTEMS</td>
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<td>HERBS, SPICES, AND MEDICINAL PLANTS</td>
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<td>INSECT AGROECOLOGY</td>
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<td>BERRY AND GRAPE PHYSIOLOGY AND CULTURE</td>
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<td>GRAPEVINE GROWTH AND PHYSIOLOGY</td>
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<td>PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION</td>
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<td>PHYSIOLOGY AND PRODUCTION OF BERRY CROPS</td>
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<td>POLLINATORS IN PERIL</td>
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<td>*FORESTS, WOOD, AND CIVILIZATION</td>
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<td>*BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION</td>
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<td>AGRI 411</td>
<td>*INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL</td>
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<td>ANS 315</td>
<td>*CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE</td>
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<td>GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
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<td>*FOOD LAW</td>
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<td>*ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN</td>
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<td>GEOG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
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<td>GEOG 340</td>
<td>*INTRODUCTION TO WATER SCIENCE AND POLICY</td>
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<td>*INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN</td>
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<td>*PLAGUES, PESTS, AND POLITICS</td>
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<td>*TECHNOLOGY AND CHANGE</td>
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<td>*ISSUES IN NUTRITION AND HEALTH</td>
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<td>PH 313</td>
<td>*ENERGY ALTERNATIVES</td>
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<td>PHL 325</td>
<td>*SCIENTIFIC REASONING</td>
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<td>PS 476</td>
<td>*SCIENCE AND POLITICS</td>
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<td>SOIL 395</td>
<td>**WORLD SOIL RESOURCES</td>
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<td>SUS 304</td>
<td>*SUSTAINABILITY ASSESSMENT</td>
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Total Hours: 47-52

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

** Option Code: 785 **
Sustainable Horticultural Production Option

This option is offered within the following major(s):

- Horticulture - College of Agricultural Sciences (p. 176)

Students in the Sustainable Horticultural Production option gain the knowledge and skills necessary to plan and manage horticultural production systems for fruit, nut, vegetable, nursery, and greenhouse crops using environmentally sustainable practices. They come to see horticulture as a way to create and maintain vital and productive agro-ecosystems and understand the role of horticulture within a larger societal context which includes issues of ecology, economics, and politics.

The Sustainable Horticultural Production option stresses active learning, case studies about real-world situations, and integrating ideas and facts from many different subjects. Sustainable Horticultural Production graduates will be active learners, and possess skills prized by employers and useful for establishing their own enterprises. They will have a broad and thorough knowledge of horticulture and the skills and knowledge needed to identify, develop, and practice ecological and sustainable methods. They will be able to think critically. They will be skilled in finding and using information, as well as synthesizing information from many sources to analyze novel situations and solve problems in the field.

Option Code: 798
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>FES 241 DENDROLOGY</td>
<td>Landscaping Plant Materials I: Deciduous Hardwoods and Conifers</td>
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<td>HORT 226</td>
<td>Landscape Plant Materials II: Spring Flowering Trees and Shrubs</td>
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<tr>
<td>HORT 228</td>
<td>Deciduous Hardwoods and Conifers</td>
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<tr>
<td>HORT 251</td>
<td>Temperate Tree Fruit, Berries, Grapes, and Nuts</td>
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<tr>
<td>HORT 255</td>
<td>Herbaceous Ornamental Plant Materials</td>
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<tr>
<td>HORT 433/CROP 433</td>
<td>Systematics and Adaptation of Vegetable Crops</td>
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**Ecology**

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<td>*Applied Ecology of Managed Ecosystems</td>
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**Technology**

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<td>HORT 414/CROP 433</td>
<td>Precision Agriculture</td>
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**Horticultural Communication**

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<td>*Applied Ecology of Managed Ecosystems</td>
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<tr>
<td>HORT 407</td>
<td>Seminar</td>
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<tr>
<td>HORT 411</td>
<td>Horticulture Book Club</td>
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**Capstone**

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<td>HORT 481</td>
<td>Horticulture Production Case Studies</td>
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**Horticultural Production**

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<td>HORT 300/CROP 300</td>
<td>Crop Production in Pacific Northwest Agroecosystems</td>
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<td>Irrigation and Drainage</td>
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**PBG 430**

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<td>Organic Farming and Gardening</td>
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<td>Floriculture and Greenhouse Systems</td>
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<td>HORT 361</td>
<td>Plant Nursery Systems</td>
</tr>
<tr>
<td>HORT 451</td>
<td>Tree Fruit Physiology and Culture</td>
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<tr>
<td>HORT 452</td>
<td>Berry and Grape Physiology and Culture</td>
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<td>HORT 453</td>
<td>Grapevine Growth and Physiology</td>
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<td>HORT 454</td>
<td>Principles and Practices of Vineyard Production</td>
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<td>HORT 456</td>
<td>Physiology and Production of Berry Crops</td>
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**Horticultural Electives**

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<td>CROP 280</td>
<td>Introduction to the Complexity of Oregon Cropping Systems</td>
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<td>ENT 322</td>
<td>Honey Bee Biology and Beekeeping</td>
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<td>HORT 199</td>
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<td>HORT 285</td>
<td>Permaculture Design and Theory: Certificate Course</td>
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<td>HORT 314</td>
<td>Principles of Turfgrass Maintenance</td>
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<td>Herbs, Spices, and Medicinal Plants</td>
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<td>HORT 463/CROP 463</td>
<td>Seed Biology</td>
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<td>HORT 480/CROP 480</td>
<td>Case Studies in Cropping Systems Management</td>
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<td>Advanced Permaculture Design Tools for Climate Resilience</td>
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<td>HORT 499</td>
<td>Special Topics (Introduction to Organic Certification)</td>
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<td>PBG 441</td>
<td>Plant Tissue Culture</td>
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<td>PBG 450</td>
<td>Plant Breeding</td>
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<td>Special Topics (Soil Management for Organic Production)</td>
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<td>Biology of Soil Ecosystems</td>
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**Business Management**

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<td>AEC 221</td>
<td>Agricultural and Food Marketing</td>
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<td>*Introduction to Environmental Economics and Policy</td>
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<td>AEC 251</td>
<td>*Introduction to Agricultural and Food Economics</td>
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<td>BA 215</td>
<td>Fundamentals of Accounting</td>
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<td>BA 260</td>
<td>Introduction to Entrepreneurship</td>
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<td>Family Business Management</td>
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<td>NMC 311</td>
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<td>*Global Poverty and Sustainable Development</td>
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<td>AEC 250</td>
<td>*Introduction to Environmental Economics and Policy</td>
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<td>AEC 251</td>
<td>*Introduction to Agricultural and Food Economics</td>
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<tr>
<td>AEC 253</td>
<td>*Environmental Law, Policy, and Economics</td>
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<tr>
<td>AEC 351</td>
<td>*Natural Resource Economics and Policy</td>
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<tr>
<td>AGRI 411</td>
<td>*Introduction to Food Systems: Local to Global</td>
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<tr>
<td>NR 201</td>
<td>Managing Natural Resources for the Future</td>
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<td>NR 202</td>
<td>Natural Resource Problems and Solutions</td>
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<td>Critical Thinking for Natural Resource Challenges</td>
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<td>NR 325</td>
<td>Scientific Methods for Analyzing Natural Resource Problems</td>
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<td>PS 201</td>
<td>*Introduction to United States Government and Politics</td>
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<td>PS 205</td>
<td>*Introduction to International Relations</td>
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<td>PS 331</td>
<td>*State and Local Politics</td>
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<td>PS 458</td>
<td>*International Political Economy</td>
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<td>Environmental Political Theory</td>
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<td>PS 473</td>
<td>US Energy Policy</td>
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<td>*Sustainability Assessment</td>
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<td>SUS 350</td>
<td>*Sustainable Communities</td>
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**Ecology and Sustainability Ecosystems Courses**

Meets Synthesis requirements. Each course must be from a different department.

**Contemporary Global Issues**

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<td>AEC 352/ECON 352</td>
<td>*Environmental Economics and Policy</td>
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<td>BI 301</td>
<td>*Human Impacts on Ecosystems</td>
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<tr>
<td>CROP 330</td>
<td>*World Food Crops</td>
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<td>FES 365</td>
<td>*Issues in Natural Resources Conservation</td>
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<td>FW 325</td>
<td>*Global Crises in Resource Ecology</td>
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<td>GEOG 300</td>
<td>*Sustainability for the Common Good</td>
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<td>GEOG 330</td>
<td>*Geography of International Development and Globalization</td>
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<td>HORT 331/ENT 331</td>
<td>Pollinators in Peril</td>
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<td>*Sustainable Communities</td>
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<td>WSE 470</td>
<td>*Forests, Wood, and Civilization</td>
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<td>Z 349</td>
<td>*Biodiversity Causes, Consequences, and Conservation</td>
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**Science, Technology and Society**

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<td>ANS 315</td>
<td>*Contentious Social Issues in Animal Agriculture</td>
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<td>BI 346</td>
<td>*Human Ecology</td>
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<td>BOT 324</td>
<td>*Fungi in Society</td>
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**Therapeutic Horticulture Option**

This option is offered within the following major(s):

- Horticulture - College of Agricultural Sciences (p. 176)

Horticultural therapy is a rapidly growing area of horticulture. The therapeutic benefits of garden environments have been understood and applied since ancient times. Horticultural therapy is recognized as a practical and effective treatment with wide-ranging benefits for people.
in therapeutic, vocational, and wellness programs. It is now taught and practiced throughout the world in a wide diversity of settings and cultures including mental health, physical rehabilitation, vocational services, corrections, long-term care and hospice, special education, and youth and community services. Horticultural therapists design garden spaces that accommodate people with a wide range of abilities and assist people with physical, emotional or mental disabilities in gaining skills, adaptations, and coping methods that enhance their lives.

Students in the Therapeutic Horticulture option graduate with a strong foundation in horticultural science and practices. In addition, they acquire the skills and knowledge needed to design healing and adapted gardens and to provide therapy programs used to improve the quality of people's lives.

**Option Code: 632**

- Confirm course work requirements for Professional Registration by the American Horticultural Therapy Association (AHTA) at http://ahta.org/professional-registration/.
- All course work must have a passing grade of C– or above or a pass for a pass/fail course.
- A 480-hour AHTA approved and supervised internship is also required for Professional Registration by the AHTA.

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<tr>
<td>HORT 226</td>
<td>LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS</td>
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<tr>
<td>HORT 228</td>
<td>LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING TREES AND SHRUBS</td>
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<tr>
<td>HORT 251</td>
<td>TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 355</td>
<td>HERBACEOUS ORNAMENTAL PLANT MATERIALS</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 433/CROP 453</td>
<td>SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS</td>
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</tbody>
</table>

**Ecology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 331/ENT 331</td>
<td>POLLINATORS IN PERIL</td>
<td>2-4</td>
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</table>

**Horticultural Communication**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 350</td>
<td>LANDSCAPE CONSTRUCTION TECHNIQUES</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 351</td>
<td>FLORICULTURE AND GREENHOUSE SYSTEMS</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 358</td>
<td>LANDSCAPE CONSTRUCTION TECHNIQUES</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 360</td>
<td>IRRIGATION AND DRAINAGE</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 361</td>
<td>PLANT NURSERY SYSTEMS</td>
<td>2-4</td>
</tr>
<tr>
<td>HORT 485</td>
<td>ADVANCED PERMACULTURE DESIGN TOOLS FOR CLIMATE RESILIENCE</td>
<td>2-4</td>
</tr>
</tbody>
</table>

Horticultural and Social Sciences
**Viticulture and Enology Option**

This option is offered within the following major(s):

- Horticulture - College of Agricultural Sciences (p. 176)

The Oregon winegrape industry has experienced steady growth since its beginning in 1961. Oregon now ranks third nationally in the number of wineries, and fourth in wine production and vineyard acreage. Vineyards
and wineries have also become an integral part of the Oregon tourism industry.

The viticulture and enology curriculum addresses the educational needs of students planning to enter the vinegrape industry as viticulturists, vineyard managers, consultants and professionals. The curriculum involves active learning, providing case studies about real-world situations, enhancing critical thinking skills through understanding the art and science of vineyard and winery production. Viticulture and enology students will be active learners in a multi-disciplinary major. Upon graduation, they will possess the skills prized by employers as managers with the ability to think critically and troubleshoot in the vineyard and winery. They will have a thorough knowledge of vine physiology, vineyard production, winery production and related topics. They will understand how their actions in the field affect the quality of the finished wine. They will be skilled in finding resources and using information to analyze novel situations and solve problems in the industry.

**Option Code: 613**

In addition to the required Horticulture Major Core courses, students in this proposed option will complete the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Plant Materials</strong></td>
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<tr>
<td>HORT 251</td>
<td>TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS</td>
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<tr>
<td><strong>Ecology</strong></td>
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<tr>
<td>Select one of the following:</td>
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<td>3-4</td>
</tr>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
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<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>HORT 318</td>
<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
<td></td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBG 430</td>
<td>PLANT GENETICS</td>
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<tr>
<td><strong>Horticultural Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HORT 407</td>
<td>SEMINAR</td>
<td>1</td>
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<tr>
<td>HORT 411</td>
<td>HORTICULTURE BOOK CLUB</td>
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<tr>
<td>Select one of the following Writing Intensive Courses:</td>
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<tr>
<td>HORT 318</td>
<td>*APPLIED ECOLOGY OF MANAGED ECOSYSTEMS</td>
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<tr>
<td><strong>Capstone</strong></td>
<td></td>
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<tr>
<td>HORT 481</td>
<td>HORTICULTURE PRODUCTION CASE STUDIES</td>
<td>4</td>
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<tr>
<td><strong>Horticultural Science and Technology</strong></td>
<td></td>
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<tr>
<td>HORT 380</td>
<td>IRRIGATION AND DRAINAGE</td>
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<tr>
<td>Select one of the following:</td>
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<td>3-4</td>
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<tr>
<td>AG 221</td>
<td>METALS AND WELDING</td>
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<tr>
<td>AG 312</td>
<td>ENGINE THEORY AND OPERATION</td>
<td></td>
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<tr>
<td>AG 391</td>
<td>FARM IMPLEMENTS</td>
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<tr>
<td>AG 425</td>
<td>DEVELOPMENTS IN AGRICULTURAL MECHANICS</td>
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<tr>
<td>HORT 260</td>
<td>ORGANIC FARMING AND GARDENING</td>
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<tr>
<td>HORT 285</td>
<td>PERMACULTURE DESIGN AND THEORY: CERTIFICATE COURSE</td>
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<tr>
<td>HORT 314</td>
<td>PRINCIPLES OF TURFGRASS MAINTENANCE</td>
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<tr>
<td>HORT 414/1/CROP 414</td>
<td>PRECISION AGRICULTURE</td>
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<tr>
<td>HORT 444/444</td>
<td>INSECT AGROECOLOGY</td>
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<tr>
<td>PBG 450</td>
<td>PLANT BREEDING</td>
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<tr>
<td>SOIL 316</td>
<td>NUTRIENT CYCLING IN AGROECOSYSTEMS</td>
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<tr>
<td><strong>Viticulture</strong></td>
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<tr>
<td>HORT 451</td>
<td>TREE FRUIT PHYSIOLOGY AND CULTURE</td>
<td>4</td>
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<tr>
<td>or HORT 452</td>
<td>BERRY AND GRAPE PHYSIOLOGY AND CULTURE</td>
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<tr>
<td>HORT 453</td>
<td>GRAPEVINE GROWTH AND PHYSIOLOGY</td>
<td>3</td>
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<tr>
<td>HORT 454</td>
<td>PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION</td>
<td>3</td>
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<tr>
<td><strong>Fermentation Foundation Sciences</strong></td>
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</tbody>
</table>

Additional requirements include 3-4 courses from the following categories:

- **Business Management**
- **Ecology and Sustainability Ecosystems Courses**
- **Contemporary Global Issues**
- **Science, Technology and Society**

Meet Synthesis requirements. Each course must be from a different department.
Organic Farming Systems Certificate

Available only via Ecampus.

This certificate provides students with technical skills and knowledge in organic farming production and regulation. The program emphasizes organic management of soil health, pests and diseases, weeds, and inputs while also providing understanding of organic regulations, policy, economics, and social implications. “Systems thinking” is utilized and cultivated throughout the courses to help students see interconnections and understand how management decisions influence all dimensions of sustainability (environmental, social, and economic).

**Certificate Code: C600**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>CROP 355</td>
<td>ORGANIC CERTIFICATION</td>
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<tr>
<td>HORT 212</td>
<td>INTRODUCTION TO ORGANIC AGRICULTURAL SYSTEMS</td>
<td>4</td>
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<tr>
<td>HORT 396</td>
<td>INPUTS IN ORGANIC CROPPING SYSTEMS: SOURCING AND EFFICACY</td>
<td>2</td>
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<tr>
<td>HORT 307</td>
<td>ORGANIC SYSTEM PREDICAMENTS</td>
<td>3</td>
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<tr>
<td>HORT 308</td>
<td>WEED MANAGEMENT IN ORGANIC CROPPING SYSTEMS</td>
<td>3</td>
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**Organic Farming Systems Certificate**

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<tr>
<th>Option Code: 613</th>
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<tbody>
<tr>
<td><strong>Course</strong></td>
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<tr>
<td>First Year</td>
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<tr>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td>CH 121</td>
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<tr>
<td>HORT 112</td>
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<tr>
<td>WR 121</td>
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<tr>
<td>Math Course</td>
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<td><strong>Winter</strong></td>
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<td>CH 122</td>
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<tr>
<td>COMM 211</td>
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<td>SOIL 205</td>
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<td>&amp; SOIL 206</td>
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<tr>
<td>Perspectives Course</td>
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<tr>
<td><strong>Spring</strong></td>
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<td>CH 123</td>
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<td>HHS 231</td>
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<td>HHS 241</td>
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<tr>
<td>Perspectives Course</td>
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<tr>
<td>Writing II Course</td>
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<tr>
<td><strong>Second Year</strong></td>
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<td><strong>Fall</strong></td>
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<td>BI 211</td>
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<td>CH 331</td>
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<td>HORT 251</td>
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<td>HORT 452</td>
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<tr>
<td>Electives</td>
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<td><strong>Winter</strong></td>
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<tr>
<td>BI 212</td>
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<tr>
<td>CH 332</td>
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<td>HORT 316</td>
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<td>HORT 318</td>
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<tr>
<td>Perspectives Course</td>
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<td><strong>Spring</strong></td>
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<td>BB 350</td>
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<td>BI 213</td>
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<td>HORT 360</td>
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<td><strong>Third Year</strong></td>
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<td><strong>Fall</strong></td>
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<td>HORT 301</td>
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<tr>
<td>MB 302</td>
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<tr>
<td>BA/AEC Course</td>
</tr>
</tbody>
</table>

Total Hours: 175-187
Certificate Code: C600

Turf and Landscape Management Minor

The Turf and Landscape Management minor is an effective way for students, including majors outside of the College of Agricultural Sciences, to meet their interests. The two areas of focus, turf or landscape, allow students to tailor their course work to personal goals.

Minor Code: 147

Students must receive a grade of C− or better in all HORT and PBG courses taken to complete the minor.

Certificate Code: CG20

Organic Agriculture Graduate Certificate

Available only via Ecampus.

This online Graduate Certificate in Organic Agriculture addresses the current educational gap created by a rapidly-growing global industry and the needs of this industry for trained, experienced professionals. The objective of this program is to provide necessary expertise, and produce graduates who will then be able to effectively work in organic food production, processing, distribution, policy-making, education, or potentially beginning their own organic-related businesses.

Certificate Code: CG20

Sustainability Minor

Also available at OSU-Cascades and via Ecampus.
The Sustainability Minor includes core sustainability courses (S) and tailored elective courses to expand students’ knowledge and experience of their primary major in the context of sustainability principles and frameworks. Courses from a student’s major course of study will count towards minor requirements. Completion of the Sustainability minor requires 27 credits within the 180-credit minimum for graduation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SUS 304</td>
<td>SUSTAINABILITY ASSESSMENT</td>
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<tr>
<td>SUS 350</td>
<td>SUSTAINABLE COMMUNITIES</td>
<td>4</td>
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</table>

**Ecological Dimensions of Sustainability**

Select one course from the following: 3-4

- BI 301  | HUMAN IMPACTS ON ECOSYSTEMS                                          |       |
- BI 306H | **ENVIRONMENTAL SOCIOLOGY                                             |       |
- SUS 102 | *INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY             |       |

**Social Dimensions of Sustainability**

Select one course from the following: 3-4

- SOC 381 | SOCIAL DIMENSIONS OF SUSTAINABILITY (Ecampus only)                    |       |
- SOC 480 | *ENVIRONMENTAL SOCIOLOGY                                              |       |
- SOC 481 | *SOCIETY AND NATURAL RESOURCES                                        |       |
- SUS 420 | SOCIAL DIMENSIONS OF SUSTAINABILITY (Ecampus or Cascades)              |       |

**Economic Dimensions of Sustainability**

Select one course from the following: 3-4

- AEC 250  | *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY                    |       |
- AEC 351  | *NATURAL RESOURCE ECONOMICS AND POLICY                                  |       |
- AEC 352/ECON 352 | *ENVIRONMENTAL ECONOMICS AND POLICY                                      |       |

**Elective credits**

Select 0-12 credits for a total of 27 in the minor

**Business and Economics**

- AEC 243  | *GLOBAL POVERTY AND SUSTAINABLE DEVELOPMENT                            | 3     |
- AEC 250  | *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY                     | 3     |
- AEC 253  | *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS                               | 4     |
- AEC 351  | *NATURAL RESOURCE ECONOMICS AND POLICY                                   | 3     |
- AEC 352/ECON 352 | *ENVIRONMENTAL ECONOMICS AND POLICY                                      |       |
- BA 302  | BUSINESS PROCESS MANAGEMENT                                             | 4     |
- BA 314  | SUSTAINABLE BUSINESS OPERATIONS                                         | 4     |
- BA 351  | MANAGING ORGANIZATIONS                                                  | 4     |
- BA 352  | MANAGING INDIVIDUAL AND TEAM PERFORMANCE                                | 4     |
- BA 362  | SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES                           | 4     |
- BA 432  | *ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS                         | 3     |
- BA 465  | *SYSTEMS THINKING AND PRACTICE                                          | 4     |
- BA 466  | INTEGRATIVE STRATEGIC EXPERIENCE                                        | 4     |
- ECON 202 | *INTRODUCTION TO MACROECONOMICS                                         | 4     |
- ECON 311 | INTERMEDIATE MACROECONOMIC THEORY                                       | 4     |
- ECON 315 | INTERMEDIATE MACROECONOMIC THEORY                                       | 4     |
- MGMT 452 | LEADERSHIP                                                             | 4     |

**Engineering**

- BEE 221 | FUNDAMENTALS OF ECLOGICAL ENGINEERING                                  | 3     |
- BEE 320  | BIOSYSTEMS ANALYSIS AND MODELING                                       | 4     |
- BEE 322  | ECLOGICAL ENGINEERING THERMODYNAMICS AND TRANSFER PROCESS              | 4     |

**Additional Courses**

- CHE 450  | CONVENTIONAL AND ALTERNATIVE ENERGY SYSTEMS                            | 3     |
- CHE 451  | SOLAR ENERGY TECHNOLOGIES                                              | 3     |
- ECE 438  | ELECTRIC AND HYBRID ELECTRIC VEHICLES                                  | 4     |
- ENGR 350 | *SUSTAINABLE ENGINEERING                                                | 3     |
- ENVE 321 | ENVIRONMENTAL ENGINEERING FUNDAMENTALS                                 | 4     |
- HEST 310 | *INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN              |       |

**Natural Sciences**

- AGRI 411 | *INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL                         | 3     |
- BI 301  | HUMAN IMPACTS ON ECOSYSTEMS                                            | 3     |
- BI 306  | **ENVIRONMENTAL ECOLOGY                                                | 3     |
- BI 347  | *OCEANS IN PERIL                                                       | 3     |
- BI 348  | *HUMAN ECOLOGY                                                         | 3     |
- BI 351  | MARINE ECOLOGY                                                         | 3     |
- BI 370  | ECOLOGY                                                               | 3     |
- BRR 325 | *ENERGY TECHNOLOGY AND SOCIAL CHANGE                                   | 3     |
- CH 374  | *TECHNOLOGY, ENERGY, AND RISK                                           | 3     |
- CH 390  | ENVIRONMENTAL CHEMISTRY                                                | 3     |
- FES 341 | FOREST ECOLOGY                                                         | 3     |
- FES 355 | MANAGEMENT FOR MULTIPLE RESOURCE VALUES                                | 3     |
- FES 365 | *ISSUES IN NATURAL RESOURCES CONSERVATION                              | 3     |
- FES 435/TOX 435 | *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK                      | 3     |
- FES 445/FW 445 | ECOLOGICAL RESTORATION                                                | 4     |
- FES 455/HORT 455 | URBAN FOREST PLANNING, POLICY AND MANAGEMENT                            | 4     |
- FES 477/NR 477 | *AGROFORESTRY                                                          | 3     |
- FES 485 | *CONSENSUS AND NATURAL RESOURCES                                       | 3     |
- FOR 462 | NATURAL RESOURCE POLICY AND LAW                                        | 3     |
- FW 251  | PRINCIPLES OF FISH AND WILDLIFE CONSERVATION                           | 3     |
- FW 303  | SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE           | 3     |
- FW 321  | APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY                                | 3     |
- FW 324  | *FOOD FROM THE SEA                                                     | 3     |
- FW 325  | *GLOBAL CRISIS IN RESOURCE ECOLOGY                                     | 3     |
- FW 326  | INTEGRATED WATERSHED MANAGEMENT                                        | 3     |
- FW 419  | THE NATURAL HISTORY OF WHALES AND WHALING                             | 3     |
- FW 435  | *WILDLIFE IN AGRICULTURE ECOSYSTEMS                                    | 3     |
- FW 462  | ECO SYSTEM SERVICES                                                    | 3     |
- FW 489  | EFFECTIVE COMMUNICATIONS IN FISHERIES AND WILDLIFE SCIENCE             | 3     |
- GEO 306 | *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT                          | 3     |
- GEO 309 | *ENVIRONMENTAL JUSTICE                                                 | 3     |
- GEOG 250 | *LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES                         | 3     |
- GEOG 300 | *SUSTAINABILITY FOR THE COMMON GOOD                                    | 3     |
- GEOG 324 | *ECOLOGICAL BIOGEOGRAPHY                                               | 4     |
- GEOG 330 | **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION           | 3     |
- GEOG 331 | *POPULATION, CONSUMPTION, AND ENVIRONMENT                             | 3     |
- GEOG 360 | GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY                 | 4     |
- GEOG 430 | RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT                           | 3     |
- GEOG 431 | GLOBAL RESOURCES AND DEVELOPMENT                                       | 3     |
- GEOG 441 | INTERNATIONAL WATER RESOURCES MANAGEMENT                              | 3     |
- GEOG 450 | LAND USE IN THE AMERICAN WEST                                          | 3     |
- GEOG 451 | PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES            | 4     |
- GEOG 452 | SUSTAINABLE SITE PLANNING                                              | 3     |
- HORT 260 | ORGANIC FARMING AND GARDENING                                          | 3     |
- NR 201  | MANAGING NATURAL RESOURCES FOR THE FUTURE                              | 3     |
- NR 202  | NATURAL RESOURCE PROBLEMS AND SOLUTIONS                                | 3     |
NR 312 CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES 3
NR 351 WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT 3
OC 333 OCEANS, COASTS, AND PEOPLE 3
PH 313 ENERGY ALTERNATIVES 3
SOIL 499 SPECIAL TOPICS 1-16
SUS 103 INTRODUCTION TO CLIMATE CHANGE 4
TRAL 351 OUTDOOR RECREATION MANAGEMENT ON PUBLIC LANDS 3
TRAL 352 WILDERNESS MANAGEMENT 3
TRAL 354 COMMUNITIES, NATURAL AREAS, AND SUSTAINABLE TOURISM 3
WSE 111 RENEWABLE MATERIALS FOR A GREEN PLANET 2
WSE 210 RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION 4
WSE 266 INDUSTRIAL HEMP 3
WSE 320 ANATOMY OF RENEWABLE MATERIALS 3
WSE 321 CHEMISTRY OF RENEWABLE MATERIALS 3
WSE 392 BAMBOOLOOZA: THE FASCINATING WORLD OF BAMBOO 3
WSE 470 FORESTS, WOOD, AND CIVILIZATION 3
Z 349 BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION 3

Social Sciences/Humanities

AEC 250 INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY 3
AEC 253 ENVIRONMENTAL LAW, POLICY, AND ECONOMICS 4
AEC 351 NATURAL RESOURCE ECONOMICS AND POLICY 3
AEC 352/ECON 352 ENVIRONMENTAL ECONOMICS AND POLICY 3
AEC 434 MEASURING RESOURCE AND ENVIRONMENTAL IMPACTS 4
AGRI 411 INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL 3
ANTH 352 ANTHROPOLOGY, HEALTH, AND ENVIRONMENT 3
ANTH 361 FOOD JUSTICE 4
ANTH 477 ECOCULTURAL ANTHROPOLOGY 4
ANTH 481 NATURAL RESOURCES AND COMMUNITY VALUES 3
ANTH 482 ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT 4
COMM 408 WORKSHOP 1-16
COMM 440 THEORIES OF CONFLICT AND CONFLICT MANAGEMENT 3
COMM 442 BARGAINING AND NEGOTIATION PROCESSES 3
ENG 482 STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT 4
FW 340 MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES 3
FW 350 ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY 3
GEO 309 ENVIRONMENTAL JUSTICE 3
GEOG 250 LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES 3
HEST 310 INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN 3
HORT 217 SOCIAL IMPACTS OF SCIENCE 3
MB 330 DISEASE AND SOCIETY 3
PHL 325 SCIENTIFIC REASONING 4
PHL 390 MORAL THEORIES 3
PHL 439 PHILOSOPHY OF NATURE 3
PHL 440 ENVIRONMENTAL ETHICS 3
PHL 443/REL 443 WORLD VIEWS AND ENVIRONMENTAL VALUES 3
PS 331 STATE AND LOCAL POLITICS 4
PS 370 SCIENCE, RELIGION, AND POLITICS 4
PS 374 SUSTAINABLE LIVING: PRACTICES AND POLICIES 4
PS 449 TOPICS IN COMPARATIVE POLITICS 4
PS 455 THE POLITICS OF CLIMATE CHANGE 4
PS 461 ENVIRONMENTAL POLITICAL THEORY 4
PS 475 ENVIRONMENTAL POLICIES AND POLICY 4
PS 477 INTERNATIONAL ENVIRONMENTAL POLICIES AND POLICY 4
SOC 360 POPULATION TRENDS AND POLICY 4
SOC 480 ENVIRONMENTAL SOCIOLOGY 4
SOC 481 SOCIETY AND NATURAL RESOURCES 4
SUS 325 AG AND ENVIRONMENTAL PREDICAMENTS: A CASE STUDY APPROACH 3
WGSS 440 WOMEN AND NATURAL RESOURCES 3
WGSS 450 ECOFEMINISM 3

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Students will work with their primary academic advisor and the Sustainability academic advisor to select electives in the theme relevant to their interests for a total of 7–10 credits. Students should discuss with Sustainability advisor to apply elective courses that may not be listed. In addition to the required credits, students must work with the Sustainability advisor to select elective courses relevant to their discipline and career path interests.

Minor Code: 871

Sustainability Undergraduate Major
(BS, HBS)

Also available at OSU-Cascades and via Ecampus.
The Sustainability undergraduate major is a concurrent degree subject to Academic Regulation 26 (p. 22). This interdisciplinary double degree pairs well with all undergraduate majors.

OSU-Corvallis and Ecampus Contact
Agricultural and Life Sciences Building (ALS)
Oregon State University
Corvallis, OR 97331
Phone: 541-737-2441
Email: Sus.Advising@oregonstate.edu

OSU-Cascades Campus Contact
Matt Shinderman
Forest Ecosystems and Society
Oregon State University Cascades
Phone: 541-322-3159
Email: matt.shinderman@osucascades.edu

Major Code: 870

All OSU undergraduate students may obtain a second degree in Sustainability by completing 32 credits in addition to the 180 credits required for one Bachelor degree, for a total of 212 credits. Post-baccalaureate students may obtain a degree in Sustainability by completing the requirements below and the requirements for a subsequent degree as outlined in Academic Regulation 26b (p. 22).
Courses that can be used to fulfill remaining elective course requirements are listed below. Students are not limited to taking courses within their primary major of study. The Sustainability Double Degree Advisor(s) will approve courses not listed here if they have an obvious link to sustainability and fulfill the intent of the Sustainability Double Degree and the student’s path of study.

Remaining Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>AEC 243</td>
<td>*GLOBAL POVERTY AND SUSTAINABLE DEVELOPMENT</td>
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<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<tr>
<td>AEC 253</td>
<td>*ENVIRONMENTAL LAW, POLICY, AND ECONOMICS</td>
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<td>AEC 351</td>
<td>*NATURAL RESOURCE ECONOMICS AND POLICY</td>
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<td>*ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<td>BA 302</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
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<td>BA 314</td>
<td>SUSTAINABLE BUSINESS OPERATIONS</td>
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<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
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<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
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<td>BA 362</td>
<td>SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES</td>
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<td>BA 432</td>
<td>*ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS</td>
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<td>BA 465</td>
<td>*SYSTEMS THINKING AND PRACTICE</td>
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<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
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<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
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<td>BEE 320</td>
<td>BIOSYSTEMS ANALYSIS AND MODELING</td>
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<td>BEE 322</td>
<td>ECOLOGICAL ENGINEERING THERMODYNAMICS AND TRANSFER PROCESS</td>
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<td>CHE 422</td>
<td>GREEN BUILDING MATERIALS</td>
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<td>CHE 450</td>
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<td>CHE 451</td>
<td>SOLAR ENERGY TECHNOLOGIES</td>
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<td>ECE 438</td>
<td>ELECTRIC AND HYBRID ELECTRIC VEHICLES</td>
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<td>ENVE 321</td>
<td>ENVIRONMENTAL ENGINEERING FUNDAMENTALS</td>
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<td>FW 462</td>
<td>ECOLOGY</td>
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<td>FW 469</td>
<td>EFFECTIVE COMMUNICATIONS IN FISHERIES AND WILDLIFE SCIENCE</td>
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<td>GEO 306</td>
<td>*MINERALS, ENERGY, WATER, AND THE ENVIRONMENT</td>
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<td>GEO 309</td>
<td>*ENVIRONMENTAL JUSTICE</td>
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<td>*LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES</td>
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<td>GEOG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
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<td>GEOG 324</td>
<td>*ECOLOGICAL BIOGEOGRAPHY</td>
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<td>GEOG 330</td>
<td>**GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
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<td>GEOG 331</td>
<td>*POPULATION, CONSUMPTION, AND ENVIRONMENT</td>
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<td>GEOG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
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<td>GEOG 430</td>
<td>RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT</td>
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<td>GEOG 431</td>
<td>GLOBAL RESOURCES AND DEVELOPMENT</td>
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<td>INTERNATIONAL WATER RESOURCES MANAGEMENT</td>
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<td>GEOG 450</td>
<td>LAND USE IN THE AMERICAN WEST</td>
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<td>GEOG 451</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
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<td>HORT 260</td>
<td>Organic Farming and Gardening</td>
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<td>NR 201</td>
<td>Managing Natural Resources for the Future</td>
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<td>NR 202</td>
<td>Natural Resource Problems and Solutions</td>
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<td>NR 312</td>
<td>Critical Thinking for Natural Resource Challenges</td>
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<td>NR 351</td>
<td>When Science Escapes the Lab: Science and Resource Management</td>
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<td>Oceans, Coasts, and People</td>
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<td>SUS 103</td>
<td>Introduction to Climate Change</td>
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<td>Outdoor Recreation Management on Public Lands</td>
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<td>Wilderness Management</td>
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<td>Communities, Natural Areas, and Sustainable Tourism</td>
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<td>Renewable Materials for a Green Planet</td>
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<td>WSE 320</td>
<td>Anatomy of Renewable Materials</td>
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<td>WSE 321</td>
<td>Chemistry of Renewable Materials</td>
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<td>WSE 385</td>
<td>Evaluating Sustainability through Life Cycle Analysis</td>
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<td>WSE 392</td>
<td>BambooLoOoza: The Fascinating World of Bamboo</td>
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<td>WSE 453</td>
<td>Forest Products Business</td>
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<td>WSE 455</td>
<td>Industrial Marketing in the Forest Sector</td>
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<td>WSE 470</td>
<td>Forests, Wood, and Civilization</td>
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<td>WSE 473</td>
<td>Biodiversity and Environmental Impact</td>
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<td>WSE 475</td>
<td>Environmental Assessment of Building Materials</td>
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<td>Z 349</td>
<td>Biodiversity Causes, Consequences, and Conservation</td>
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<td>Introduction to Environmental Economics and Policy</td>
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<td>Environmental Law, Policy, and Economics</td>
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<td>Natural Resource Economics and Policy</td>
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<td>Measuring Resource and Environmental Impacts</td>
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<td>ANTH 352</td>
<td>Anthropology, Health, and Environment</td>
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<td>ANTH 361</td>
<td>Food Justice</td>
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<td>ANTH 477</td>
<td>Ecological Anthropology</td>
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<td>ANTH 481</td>
<td>Natural Resources and Community Values</td>
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<td>Bargaining and Negotiation Processes</td>
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<td>ENG 482</td>
<td>Studies in American Literature, Culture, and the Environment</td>
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<td>FES 486</td>
<td>Public Lands Policy and Management</td>
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<td>FW 340</td>
<td>Multicultural Perspectives in Natural Resources</td>
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<td>FW 350</td>
<td>Endangered Species, Society and Sustainability</td>
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<td>GEOG 250</td>
<td>Land Use Planning for Sustainable Communities</td>
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<td>HEST 310</td>
<td>Intro to Community Engagement and Community-Based Design</td>
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<td>Social Impacts of Science</td>
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<td>MB 330</td>
<td>Disease and Society</td>
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<td>Moral Theories</td>
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<td>PHL 439</td>
<td>Philosophy of Nature</td>
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<td>PHL 440</td>
<td>Environmental Ethics</td>
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<td>World Views and Environmental Values</td>
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<td>PS 331</td>
<td>State and Local Politics</td>
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<td>PS 370</td>
<td>Science, Religion, and Politics</td>
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<td>PS 374</td>
<td>Sustainable Living: Practices and Policies</td>
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<td>PS 449</td>
<td>Topics in Comparative Politics</td>
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<td>PS 455</td>
<td>The Politics of Climate Change</td>
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<td>PS 461</td>
<td>Environmental Political Theory</td>
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<td>PS 475</td>
<td>Environmental Politics and Policy</td>
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<td>International Environmental Politics and Policy</td>
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<td>SOC 360</td>
<td>Population Trends and Policy</td>
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<td>SOC 480</td>
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<td>SOC 481</td>
<td>Society and Natural Resources</td>
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<td>AG and Environmental Predicaments: A Case Study Approach</td>
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</tbody>
</table>

* Bacc Core Course (BCC)

^ Writing Intensive Course (WIC)

+ Recommended courses

++ In addition to the required credits, students must work with the Sustainability Double Degree Advisor to select elective courses relevant to their discipline and career path interests

1 Sustainability Double Degree students are required to complete a minimum of 3 Practicum credits and may complete up to 12 Practicum credits. Credits beyond the 3 credit requirement will be applied to Sustainability Electives. Before registering for a Practicum (https://agsci.oregonstate.edu/sustainability-double-degree/practicum/), students must get Practicum approved by their campus Sustainability Double Degree Advisor

2 SUS 410 credits may be achieved by participation in an alternative break trip, international internship, and/or faculty led study tour with advisor approval

**Major Code: 870**

**College of Business**

College of Business
443 Austin Hall
Corvallis, Oregon 97331-2603
Phone: 541-737-2551
Website: http://business.oregonstate.edu/

**Student Services**

Advising and Services,
Phone: 541-737-3716
Email: studentservices@oregonstate.edu
(studentservices@bus.oregonstate.edu)

Career Success Center
Phone: 541-737-8957
Email: csc@oregonstate.edu (csc@bus.oregonstate.edu)

Graduate Business Programs
Phone: 541-737-5510
Administration

Jim Coakley, Interim Dean and Senior Associate Dean for Analytics and Operations, 541-737-5510, jim.coakley@oregonstate.edu
Jonathan Arthurs, Associate Dean for Research and PhD Program Director, 541-737-6036, jonathan.arthurs@oregonstate.edu
Colleen Bee, School Head for Marketing, Analytics, and Design, 541-737-6059, colleen.bee@oregonstate.edu
John Becker-Blease, Associate Dean for Graduate Student Development and School Head for Accounting, Finance, and IS, 541-737-6061, john.becker-blease@oregonstate.edu
Malcolm LeMay, Director of Operations, 541-737-6021, malcolm.lemay@bus.oregonstate.edu
Byron Marshall, Assistant Dean for Assessment, Accreditation and Analytics, 541-737-6054, byron_marshall@oregonstate.edu
Prem Mathew, Associate Dean for Undergraduate Student Development, 541-737-6030, prem.mathew@oregonstate.edu
Andrew Olstad, Assistant School Head for Marketing, Analytics, and Design, 541-737-3159, andy.olstad@oregonstate.edu
Pauline Schilpzand, School Head for Management, Entrepreneurship, and Supply Chain, 541-737-2717, pauline.schilpzand@oregonstate.edu
Inara Scott, Assistant Dean for Teaching and Learning Excellence, 541-737-4102, inara.scott@oregonstate.edu
Logan Steele, Associate School Head for Accounting, Finance, and IS, 541-737-8659, logan.steele@oregonstate.edu
Michele Swift, Assistant School Head for Management, Entrepreneurship, and Supply Chain, 541-737-4110, michele.swift@oregonstate.edu

College of Business (CoB)

The College of Business provides nationally recognized research-based education that prepares profession-ready graduates who can excel in an innovative knowledge-based economy. The college offers degree programs for Bachelor of Arts (BA), Bachelor of Science (BS), Masters of Accountancy (MAC), Master of Business Administration (MBA), Master of Science in Business (MSB), and Doctor of Philosophy (PhD). The undergraduate and graduate programs in business and the undergraduate program in accounting are all accredited by the Association to Advance Collegiate Schools of Business.

High School Preparation

The following high school courses are recommended for students planning to enroll in the College of Business: English, four years; mathematics, four years; history and social studies, three years; foreign language, two years; natural science, two years. In addition, competence in microcomputer word processing, spreadsheet, and database software is recommended.

Transfer Students

Students planning to transfer into the College of Business should do so as early as possible. Those planning to transfer from a community college should consult with an advisor at the community college to determine the most appropriate courses to complete prior to transfer. An advisor in the College of Business should also be contacted for advice.

Concurrent Degrees

Students who wish to earn an undergraduate degree from the College of Business combined with another OSU degree may enroll in a concurrent degree program. Some degrees must be completed in conjunction with a primary degree (see the International Studies major in International Programs [https://catalog.oregonstate.edu/college-departments/international-programs/], the Sustainability major in the Department of Forest Ecosystems and Society [https://catalog.oregonstate.edu/college-departments/forestry/forest-ecosystems-society/], or the Education major in the College of Education [https://catalog.oregonstate.edu/college-departments/education/]) for more information.) The requirements for earning two degrees are listed under Earning a Degree at OSU [https://catalog.oregonstate.edu/earning-degrees/]. Students who intend to obtain one of their degrees from the College of Business should see an advisor in the College of Business as soon as possible.

Minor Programs

The College of Business offers multiple transcript-visible minor for students majoring in other disciplines. More information may be obtained from the College of Business Advising Office, Austin Hall 122, 541-737-3716.

Advising and Experiential Learning

The College of Business has experienced advisors available to assist students in all academic matters, as well as in the areas of career choice, internships, and other experiential learning opportunities. The resources of the Career Development Center (http://career.oregonstate.edu/) and College of Business Career Success Center (http://business.oregonstate.edu/careers/) (Austin Hall 102) are available to all students seeking information concerning career development and interviews with visiting firms.


The Arthur Stonehill International Business Exchange Program

The College of Business administers the largest international business exchange program in the state. This opportunity allows qualified students to study abroad in one of 13 carefully selected and approved programs. Successful completion of course work enables students to earn their option in International Business through this one term of study. Current programs are available in Austria, Australia (I.B. option not available here), Chile, Czech Republic, Denmark, Germany, Hong Kong, Netherlands, Norway, Singapore, Spain, Sweden, and Thailand. A one-credit orientation class is required the term prior to departure, and a reflection paper is due upon return. All courses are taught in English and focus on various aspects of international finance, management, and marketing.

Austin Family Business Program

Sherri Noel, Director
Located within the College of Business since 1985, the Austin Family Business Program fosters family businesses through workshops, checklists, videos, academic courses, and internet resources. The program helps business-owning families manage day-to-day operations and plan for future generations.

C2C Marketing Lab

Johnny Chen, Director
The C2C Marketing Lab provides professional market research and consulting services in order to provide insight into markets, businesses, and today’s consumers. Our teams are led by marketing faculty who
mentor teams of students in the field and in the classroom. In doing that, the C2C Marketing Lab brings faculty expertise and research experience into the business community and provides students with experiential learning opportunities that prepare them for marketing careers. Through these efforts, we support the College of Business, Oregon State University, and Oregon’s economic development.

**InnovationX Program**

*Melanie Mitchell, Director*

InnovationX is Oregon State’s hub for student entrepreneurs, innovators and changemakers. We support students who have ideas, who have already started a business or who are simply passionate and drawn to innovation. We provide the resources, education and community that can help students capture, share and test ideas and turn them into reality. Please visit the InnovationX website (https://business.oregonstate.edu/InnovationX/) for more information.

**Continuing and Professional Education**

*Melanie Mitchell, Director*

The College of Business offers online certificates, Portland executive training, and custom corporate programs taught by faculty and industry experts. Our offerings are designed for learners to gain new skills, prepare for a career move or develop the training to take your team to the next level. Available courses can be found online (https://business.oregonstate.edu/continuing-and-professional-education/).

Students wanting to earn a bachelor of arts degree in the College of Business will need to:

1. Demonstrate proficiency through the second year of a foreign language (foreign language is defined as completing the 213 level of that language with a C or better or getting a signed letter from the School of Language, Culture, and Society that states they have determined the student has that level of proficiency without needing the course work), and
2. Demonstrate cultural awareness by either:
   a. Completing 6 credits of upper-division course work focusing on the culture of regions that commonly use the foreign language in which the student is proficient, or
   b. Successfully complete a study abroad, global internship, or research experience of at least 10 weeks in a non-English speaking foreign country while enrolled at OSU. This experience must be clearly documented for audit purposes.

**Academic and Professional Standards**

The standards set forth below apply to all students enrolled in the College of Business (COB) and are in addition to those standards applicable to all students in the university. Students are responsible for satisfying these requirements.

**Prerequisite Grade Requirements**

A grade of C– or better is required for all classes within a College of Business degree program. A higher grade is required in some classes as noted in the catalog.

**Academic Progression Standards**

Academic progression standards specify the requirements a student must meet in order to graduate with a degree from the College of Business. OSU has minimum GPA standards. The College of Business (COB) has additional GPA requirements and standards. Students must satisfy both OSU and COB standards to earn their business degree. College requirements apply to minors unless stated otherwise.

The COB Progression Standards require that students:

- Achieve a minimum grade of C– or better in all classes used to complete their degree program.
- Maintain a minimum 2.5 GPA over all course work completed within their degree program.
- Complete over fifty percent of the degree program and discipline course work at OSU.
- Resolve all incomplete (I) grades in any classes within the degree program within one year, or prior to graduation, whichever occurs first.
- Make satisfactory progress toward the completion of the degree program in a timely fashion.

The College of Business degree program includes all COB classes (ACTG, BA, DSGN, FIN, MGMT, MRKT) taken for major and elective credit and non-College classes that are part of the degree requirements (see table below). Any course used to satisfy COB degree requirements must be taken using the A–F grade mode. The Satisfactory/Unsatisfactory (S/U) grade basis may not be used.

Transfer grades in COB degree program classes may be used to satisfy course work requirements but are not used in the overall GPA calculation used to determine graduation. They are, however, used in the All Inclusive Business GPA. Thus, if a course is completed at OSU and must be repeated to earn a higher grade, then the course must be repeated at OSU for the grade to be included in the GPA calculation.

Lower-division classes (100–200 level) completed at any accredited college or university with a grade of C– or higher may be used to satisfy lower-division core requirements, but will not be included in the overall COB GPA calculation. These transfer courses will be used in the All Inclusive Business GPA.

Upper-division classes (300-level and above) completed with a grade of C– or higher at school(s) accredited by the Association to Advance Collegiate Schools of Business may be used to satisfy upper-division core and discipline-specific course work requirements, but will not be included in the overall COB GPA calculation. These transfer courses will be used in the All Inclusive Business GPA.

<table>
<thead>
<tr>
<th>Progression Group</th>
<th>BA Classes</th>
<th>Non-BA Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower-division</td>
<td>BA 160, BA 161, BA 162, WR 222/323/327, BA 211, BA 213, BA 223, MTH 241, BA 230, BA 240, BA 260, COMM 111/114/218, BA 270, BA 275, BA 281, ECON 201, ECON 202 BA 282, BA 283, BA 284</td>
<td></td>
</tr>
<tr>
<td>Business Core</td>
<td>BA 311, BA 312, BA 313, BA 347, BA 352, BA 354, BA 357, BA 370 or ACTG 378, BA 375, BA 411, BA 412, BA 413, BA 466</td>
<td></td>
</tr>
<tr>
<td>Upper-Division</td>
<td></td>
<td></td>
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<tr>
<td>Business Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discipline-Specific</td>
<td>All ACTG, BA, DSGN, FIN, HM, MGMT, MRKT courses completed as part of the business degree</td>
<td></td>
</tr>
</tbody>
</table>
**Progression Group** | **BA Classes** | **Non-BA Class**
--- | --- | ---
Lower-division Design Core | DSGN 226 or DSGN 276 or DSGN 287 | ART 101, ART 204/205/206, COMM 111/114/218, ECON 201, MTH 111, ST 201, WR 121, WR 222/323/327
Upper-Division Design Core | BA 315, BA 352, BA 354, ART 367 | BA 390, DSGN 341, MGMT 364, MRKT 492, MRKT 495
Discipline-Specific Course Work | All ACTG, BA, DSGN, FIN, MGMT, MRKT courses completed as part of the design degree |

**Guiding Professional Standards for the College of Business Community**

As a member of the College of Business community, you should strive to:

- treat others with honesty, respect, and courtesy;
- maintain the highest levels of academic integrity;
- act in accordance with ethical and social responsibilities;
- foster a professional learning environment; and
- act in a professional manner.

You are also expected to comply with the law as well as all university regulations and policies that apply to you. Those university policies include, but are not limited to, the University Student Conduct Regulations, the university's Discrimination and Harassment Policies and the university's Policy on Acceptable Use of Computing Resources. Failure to comply with these laws, regulations, and policies may result in the pursuit of disciplinary action by the college, as detailed further below.

**General Statement on Professional Conduct and Academic Integrity**

The Guiding Professional Standards for the College of Business community, subscribed to by all members of the College of Business community, are intended to support and implement the values held by the college. Those values encompass the pursuit of excellence in teaching, learning and scholarship. All members of the College of Business community accept our responsibility to strive to meet those standards and to act in an ethically proper manner in our dealings with others. We dedicate ourselves to create and nurture a culture of innovation, cooperation, diversity and mutual respect within the College of Business while recognizing and pursuing the social responsibilities imposed by these values.

A reputation for personal integrity is valuable in the business and broader world. A good reputation is created through personal behavior and performance over time that is observed by friends, colleagues, and business associates, both superiors and subordinates.

The students, faculty, administrators and staff of the College of Business are committed to fostering and creating a positive, professional learning environment. These goals will be pursued by conduct that is honest, civil, courteous and responsible.

**College of Business Corrective Actions for Failure to Meet Academic or Professional Standards**

The College of Business Corrective Actions govern the college's response to a student's failure to progress adequately academically in the college or a violation of the law or University regulations and policies that apply to the student, including the Guiding Professional Standards of the college, the university Student Conduct Regulations, the university's Discrimination and Harassment Policies, or the university's Policy on Acceptable Use of Computing Resources. As is the case for all students, College of Business students are also subject to the University's Student Conduct Regulations and the procedures for enforcement of those regulations.

A failure by the student to progress adequately academically or a violation by the student of any of the College or University standards or policies listed in the above paragraph may result in the pursuit of one or more of the actions detailed below, including dismissal of the student from the College. The College will notify a student against whom it pursues such action with information about the effect of the action on the student's status in the College and information regarding how the student may respond to or appeal the action.

A student against whom the College pursues such action will be issued one of the following notices, depending on the student's academic status or the severity or frequency of the behavior resulting in the action:

**Warning For Academic and Professional Behavior**

‘Warning’ status is cautionary and is issued for one or more of the following academic reasons:

- Earning a ‘D’ or ‘F’ grade in a COB degree program class.
- A small deviation below the minimum 2.50 COB GPA requirement.
- Failure to complete COB degree program coursework in a timely fashion.

A 'Warning' may also be issued to identify student behavior, which may place a student's enrollment status in the College at risk. The warning status may be removed following satisfactory resolution of behavioral concerns, as determined by the College.

**Probation for Academic and Professional Behavior**

If a student has larger deviations from the COB academic progression standards than those defined for a warning, or if the student continues to be out of compliance with any of the COB academic progression standards following a Warning, the student may be placed on probation and may be required to take specific action to correct the problem(s).

Student behavior that is a significant departure from the law, College or University regulations and policies that apply to the student may also result in 'Probation' status. Such behavior includes, but is not limited to, academic dishonesty, criminal violations, repeated or intentional violation of University policies, or significant breaches of the University Student Conduct Regulations, the University's Policy on Discrimination and Harassment or the University's Policy on Acceptable Use of Computing Resources.

A student on probation status must follow recommendations of the college in order to avoid suspension or dismissal. Students on probation status should meet with an advisor each term to review their progress and standing in the college until the probation status is removed. Students who successfully fulfill the recommendations will be removed from probation status. Students who fail to follow recommendations...
from advisors or are unsuccessful in correcting deficiencies will be placed on suspension and evaluated for dismissal from the college.

Probation may also be continued if a student is still out of compliance with academic or behavioral requirements but is taking steps to correct the problem(s) identified.

**Suspension for Academic and Professional Behavior**

A student may be placed on suspension and evaluated for dismissal from the College if the student does not take steps to become compliant with the College's academic progression standards (such as retaking a class the student has failed), or the student is not making adequate progress in correcting the student's academic problems.

A student may be placed on suspension and evaluated for dismissal from the College if the student's behavior is a sufficiently severe and significant departure from the law, College or University regulations and policies that apply to the student, or the student fails to constructively address previous behavioral concerns after College actions.

In the event of a second instance of academic dishonesty, the student will be suspended and evaluated for dismissal from the College.

A student placed on suspension status for academic or behavioral reasons will not be allowed to progress in the College.

**Dismissal from the College**

Students placed on Suspension status will be evaluated for Dismissal from the College. The College will review the student’s record, including any interim proof of progress. After review, the College may recommend immediate Dismissal from the College, recommend that the student be continued on Suspension status pending receipt of additional information, or prescribe a plan to address specific concerns that resulted in the student's Suspension status. If a plan for progression is developed by the College, the student will be placed on Probation status pending satisfactory progress.

If Dismissed from the College, the student must wait a minimum of one term before reapplying for admission to the College and must meet current criteria for admissions to the College.

If the student was Dismissed and later qualifies for readmission, the student must start in the Pre-Professional program and reapply to the Professional Program when eligible. If the College's academic standards or requirements have changed since the student was last a College of Business major, the student will be subject to the more recent standards or requirements.

**Appeal of Academic or Corrective Status**

Students engaged in an appeal of their Dismissal from the College will remain on Suspension status pending resolution of their appeal.

1. Any student who wishes to challenge the student’s academic or corrective status at the College must submit an appeal in writing to the Dean of the College within seven (7) calendar days following the issuance of a notice from the College identifying the student’s status. The request for an appeal must include specific justification, including errors, failure to consider all of the evidence presented, or any other action, including any new evidence not known at the time of the original meeting, that may change the outcome. The Dean may refer the issue back to the College's Standing Committee for review, if warranted. Following the review, the Dean will notify the affected student of their decision by mail or email.

2. The student may appeal the Dean’s decision to the Oregon State University Provost in writing within seven (7) calendar days following the issuance of a decision by the Dean. The Provost’s decision on the appeal is the University’s final decision.

**Undergraduate Programs**

**Majors**

- Accountancy (p. 232)
  - Options:
    - Accounting Information Systems (p. 235)
    - Dean's Academy (p. 235)
    - International Business (p. 236)

- Apparel Design (p. 237)
  - Options:
    - Dean's Academy

- Business Administration (p. 246)
  - Options:
    - Dean's Academy (p. 248)
    - Digital Marketing (p. 249)
    - Entrepreneurship for Business Majors (p. 249)
    - Family Business
    - General Business (p. 250)
    - Hospitality Management (p. 250)
    - International Business (p. 250)
    - Marketing (p. 251)
    - Merchandising Management (p. 251)
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- Business Analytics (p. 252)
  - Options:
    - Digital Marketing Analytics
    - Human Resource Analytics
    - Market Research and Consumer Analytics

- Business Information Systems (p. 257)
  - Options:
    - Dean's Academy (p. 259)
    - International Business (p. 260)

- Design and Innovation Management (p. 261)
  - Options:
    - Dean's Academy (p. 262)

- Finance (p. 265)
  - Options:
    - Dean's Academy (p. 268)
    - International Business (p. 268)
    - Hospitality Management (p. 269)
    - Innovation Management (p. 270)

- Interior Design (p. 270)
  - Options:
    - Dean's Academy

- Management (p. 272)
  - Options:
• Dean’s Academy (p. 275)
• International Business (p. 275)
• Marketing (p. 276)

Options:
• Dean’s Academy (p. 279)
• International Business (p. 280)
• Merchandising Management (p. 281)

Options:
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• Business and Entrepreneurship (p. 255)
• Entrepreneurship (p. 263)
• Family Business (p. 264)
• Finance (p. 265)
• Marketing (p. 276)
• Merchandising Management (p. 280)
• Organizational Leadership (p. 284)
• Professional Sales (p. 284)

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• Business (p. 256)

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• Financial Planning
• Marketing Insights and Analytics
• Supply Chain Analytics (p. 257)
• Business Administration (p. 240)

Options:
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• Business Analytics (p. 241)
• Corporate Finance
• Innovation Management
• Human Resource Management
• Marketing
• Organizational Leadership
• Research Thesis (p. 244)
• Strategy, Entrepreneurship, and Innovation
• Supply Chain and Logistics Management
• Design and Human Environment (p. 292)

Minors
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• Design and Human Environment (p. 293)
• Entrepreneurship and Innovation Management (p. 263)
• Organizational Leadership (p. 283)

Certificates
• Business Analytics (p. 252)
• Business Fundamentals (p. 256)
• Financial Planning (p. 269)
• Supply Chain and Logistics Management (p. 293)

School of Accounting, Finance, and IS

Professors Elston, Graham, Reitsma, J. Yang
Associate Professors Becker-Blease, Berger, Coakley, He, Marshall, Mathew
Assistant Professors Akroyd, Blackburne, Deng, Kalodimos, Obermire, Pesch, Shao, Steele, S. Yang
Senior Instructors Bourne, Fudge, Raja
Instructors Adams, Arora, Leong, Loach, Montgomery, Perez, Rush, Van Varadharajan

School of Marketing, Analytics, and Design

Professor Hsieh, Marks
Associate Professors Barnhart, Bee, H. Chen, Koenig, S. Lee, Read, Scott, Zhu
Assistant Professor Chang, Fan, Huff, Reynolds-McInlay, Stornelli, Watson
Senior Instructors Desai, Dickson, Feeney, Olstad, Smouse

School of Management, Entrepreneurship, and Supply Chain

Professor Arthurs, Baldridge, Wu
Associate Professors Barden, J. Chen, J. Cho, Hoehn-Weiss, Howes, Kim, Leavitt, Murnieks, Schipzand
Assistant Professors S. Cho, Gerasymenko, Hardy, Houston, Joshi, Lee, Murali, Murphy, Paterson, Ribbink
Senior Instructor Lewis, McNeely, Smith, Swift
Instructors Broome, Buchanen, Cieri, Crangle, De Oliveira, Martell, Martin, McCalpine, Mentler, Micheau, Morris, Noxel, Palmer, Perle, Ramos, Rock, Tripathi, Wascher

Engagement
Instructors Carpenter, Caruso, Flores, Hodges, Longo, McCauley, Neubaum, Neuman, Salchenberg, Trinidad, Vierra, Villalobos, Young

Accounting

ACTG 317. EXTERNAL REPORTING I. (4 Credits)
Examines the theory and practice of financial accounting, the processing and controls phases of the accounting system, and reporting to external parties. Emphasis is placed on the accounting cycle and financial statement structure and content. The emphasis on the accounting cycle includes the processing and tracing of transaction data from source documents to financial statements.
Prerequisites: (BA 211 with C or better or BA 211H with C or better) and (BA 213 [C] or BA 213H [C])
Equivalent to: BA 317
ACTG 318. EXTERNAL REPORTING II. (4 Credits)
Continuation from ACTG 317 and the theory and practice of financial accounting and the reporting to external parties. Covers financial reporting objectives to provide information that is useful in investment and credit decisions, in assessing cash flow prospects, and about company resources and claims to those resources.
Prerequisites: ACTG 317 with C or better
Equivalent to: BA 318

ACTG 319. EXTERNAL REPORTING III. (4 Credits)
Continuation from ACTG 318 and the theory and practice of financial accounting and the reporting to external parties. Covers financial reporting objectives to provide information that is useful in investment and credit decisions, in assessing cash flow prospects, and about company resources and claims to those resources.
Prerequisites: ACTG 318 with C or better
Equivalent to: BA 319

ACTG 321. COST MANAGEMENT I. (4 Credits)
Reinforces and builds on the language and concepts of management accounting. Emphasizes different models for product costing and examines their effects on profit planning, budgeting, motivation, and control.
Prerequisites: ACTG 317 with C or better
Equivalent to: BA 321

ACTG 326. ACCOUNTING RESEARCH METHODS AND TOPICS. (2 Credits)
Covers the theory and practice of corporate financial reporting. It highlights the development of generally accepted accounting principles (GAAP) and accounting policy choices from two perspectives. First, it examines accounting policy making at the macro (standard setter) level, as well as to examine the past, present, and future role of standard setters in formulating accounting policy. Second, from the micro or company level, it will use cases involving decisions in financial reporting to evaluate accounting conventions, particularly with regard to how those decisions reflect economic reality and the quality of earnings. It will also conduct applied accounting research.
Prerequisites: (BA 211 with C or better or BA 211H with C or better) and (BA 213 [C] or BA 213H [C])

ACTG 378. ACCOUNTING INFORMATION MANAGEMENT. (4 Credits)
Introduces students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, the system life cycle model, systems analysis and design methodologies, and the development and implementation of information systems. Lec/rec.
Prerequisites: (BA 213 with C or better or BA 213H with C or better) and (BA 270 [C] or BA 270H [C] or BA 302 [C]) and (BA 275 [C] or BA 275H [C] or BA 276 [C])
Equivalent to: ACTG 378H, BA 378

ACTG 378H. ACCOUNTING INFORMATION MANAGEMENT. (4 Credits)
Introduces students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, the system life cycle model, systems analysis and design methodologies, and the development and implementation of information systems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 213 with C or better or BA 213H with C or better) and (BA 270 [C] or BA 270H [C] or BA 302 [C]) and (BA 275 [C] or BA 275H [C] or BA 276 [C])
Equivalent to: ACTG 378

ACTG 379. ACCOUNTING ANALYTICS. (4 Credits)
Covers the analysis of data as it pertains to accounting professionals. The focuses include analytic techniques for decision making and the examination of “big data” involving accounting information. Hands-on experiences will develop skills with select software tools used in data analytics for accounting professionals.
Prerequisites: ACTG 318 with C or better and (ACTG 378 [C] or ACTG 378H [C])

ACTG 405. READING & CONFERENCE. (1-6 Credits)
This course is repeatable for 12 credits.

ACTG 414. FORENSIC ACCOUNTING. (2 Credits)
Explores the forensic accountant’s role in today’s economy. Topics covered include fraud detection and fraud investigation techniques, valuation of closely held businesses, lost profits analyses, and various types of litigation support services. Fundamental legal concepts governing expert witness testimony are also examined, and students are required to quantify economic damages in cases.
Prerequisites: ACTG 319 with C or better

ACTG 415. GOVERNMENTAL AND NOT-FOR-PROFIT. (2 Credits)
Introduction to accounting and financial reporting for governmental and not-for-profit organizations. Topics include state, local and federal governmental accounting, including fund accounting and reporting, and accounting for not-for-profit hospitals, universities, and health/welfare organizations.
Prerequisites: ACTG 319 with C or better

ACTG 416. ACCOUNTING RESEARCH AND ANALYSIS. (2 Credits)
Covers the theory and practice of corporate financial reporting. It highlights the development of generally accepted accounting principles (GAAP) and accounting policy choices from two perspectives. First, it examines accounting policy making at the macro (standard setter) level as well as to examine the past, present, and future role of standard setters in formulating accounting policy. Second, from the micro or company level it will use cases involving decisions in financial reporting to evaluate accounting conventions, particularly with regard to how those decisions reflect economic reality and the quality of earnings. It will also conduct applied accounting research.
Prerequisites: ACTG 319 with C or better

ACTG 417. ADVANCED ACCOUNTING. (4 Credits)
An advanced course in financial accounting theory. Covers corporate combinations, consolidated financial statements, and government and not-for-profit accounting.
Prerequisites: ACTG 319 with C or better
Equivalent to: BA 417

ACTG 418. ACCOUNTING CODES OF PROFESSIONAL CONDUCT AND ETHICAL BEHAVIOR. (2 Credits)
Explores ethical reasoning, integrity, objectivity, independence and other core values as defined by the American Institute of Certified Public Accountants.
Prerequisites: ACTG 319 with C or better

ACTG 419. MULTINATIONAL ACCOUNTING AND ANALYSIS. (2 Credits)
Examines the managerial and financial accounting function from an international perspective. Focuses on the flow of information in multiple currencies and compliance with reporting requirements in the United States, Europe and Japan.
Prerequisites: ACTG 319 with C or better
ACTG 420. IT AUDITING. (4 Credits)
Explores key information systems issues such as planning, acquisition, delivery, and monitoring from a risk and control perspective. Students learn to use IT audit standards, guidelines, and frameworks and build data analysis tool skills.
Prerequisites: (ACTG 319 with C or better or BA 372 with C or better) and ACTG 378 [C]
Equivalent to: BA 420

ACTG 422. STRATEGIC COST MANAGEMENT. (4 Credits)
Continuation of concepts and processes of management accounting. Emphasizes relevant costs, cost accumulation and allocation, segment performance measurement and control and quantitative techniques.
Prerequisites: ACTG 319 with C or better and ACTG 321 [C] and BA 357 [C]
Equivalent to: BA 422

ACTG 424. TAXATION I. (4 Credits)
Covers concepts related to business taxation and focuses primarily on 1) basic income tax law as it relates to businesses, 2) the role of income taxes in decision making processes, and 3) basic income tax research. In addition, the course is intended to assist students in preparation to become a professional, and thus contains components designed to aid in the development of technical, analytical, problem-solving and communication skills.
Prerequisites: ACTG 319 with C or better
Equivalent to: ACTG 325

ACTG 425. ADVANCED TAXATION. (4 Credits)
Examination of the federal tax system as it applies to corporations, partnerships, and estates and trusts. Emphasis is placed on understanding tax planning for business owners and refining the ability to research tax issues.
Prerequisites: ACTG 325 with C or better or ACTG 424 with C or better
Equivalent to: BA 425

ACTG 427. ASSURANCE AND ATTESTATION SERVICES. (4 Credits)
Assertions of enterprises gain credibility when examined by an independent third party. Assurance and attestation provide credibility. Coverage includes ethics, risk, materiality, internal control, evidence and reporting.
Prerequisites: ACTG 319 with C or better
Equivalent to: BA 427

ACTG 428. ADVANCED AUDIT ANALYTICS. (4 Credits)
An advanced four-credit course covering audit theory, current audit practice and auditor professional skills. The equivalent of three credits (30 hours) relates to in-class activities, readings, presentations, research and group discussions of relevant advanced audit topics. The equivalent of one credit (10 hours) relates to understanding the use and future of data analytics in the audit profession. Theory, current audit practice and auditor professional skills.
Prerequisites: ACTG 427 with C or better

ACTG 429. TOPICS IN ACCOUNTING. (1-4 Credits)
Analysis of current topics in accounting. Topics will vary from term to term.
Equivalent to: BA 429

ACTG 516. ACCOUNTING RESEARCH AND ANALYSIS. (3 Credits)
Emphasis on financial accounting, tax and auditing research and analysis and communication of conclusions in the context of accounting case studies.

ACTG 517. ADVANCED ACCOUNTING. (4 Credits)
An advanced course in financial accounting theory. Corporate combinations, consolidated financial statements, foreign operations and subsidiaries, partnerships, and sole proprietors; contemporary issues in financial accounting.
Equivalent to: BA 517
Recommended: ACTG 319

ACTG 518. ACCOUNTING THEORY AND PRACTICE I. (3 Credits)
Expands and integrates knowledge of US and international generally accepted accounting principles (GAAP) in a rigorous study of the design, selection, and consequences of various models of financial reporting.
Prerequisites: (ACTG 516 with C or better and ACTG 517 [C])

ACTG 519. ACCOUNTING THEORY AND PRACTICE II. (3 Credits)
Study of the design, selection, and consequences of various models of financial reporting. Research accounting treatments for complex facts and circumstances with ambiguous accounting guidance. Build on financial reporting models to develop in-depth understanding and application of accounting practice.
Prerequisites: ACTG 518 with C or better

ACTG 520. IT AUDITING. (4 Credits)
Explores key information systems issues such as planning, acquisition, delivery, and monitoring from a risk and control perspective. Students learn to use IT audit standards, guidelines, and frameworks and build data analysis tool skills.
Recommended: (ACTG 319 or BA 372) and ACTG 378

ACTG 522. STRATEGIC COST MANAGEMENT. (4 Credits)
Continuation of concepts and processes of management accounting. Emphasizes relevant costs, cost accumulation and allocation, segment performance measurement and control and quantitative techniques.
Recommended: ACTG 319, ACTG 321 and BA 357

ACTG 524. INTRODUCTION TO TAXATION. (4 Credits)
Meets two major objectives. First, it is a technical introduction to U.S. income tax with emphasis on general and business related topics. Second, it provides a framework for students to launch further study in the tax area. Students will be encouraged to supplement text materials with readings from the Internal Revenue Code and Regulations as well as secondary tax research services.
Prerequisites: BA 528 with C or better

ACTG 525. ADVANCED TAXATION. (4 Credits)
Examination of the federal tax system as it applies to corporations, partnerships, and estates and trusts. Emphasis is placed on understanding tax planning for business owners and refining the ability to research tax issues.
Recommended: ACTG 424

ACTG 527. ASSURANCE AND ATTESTATION SERVICES. (4 Credits)
Assertions of enterprises gain credibility when examined by an independent third party. Assurance and attestation provide credibility. Coverage includes ethics, risk, materiality, internal control, evidence and reporting.
Equivalent to: BA 527
Recommended: ACTG 319

ACTG 529. TOPICS IN ACCOUNTING. (1-4 Credits)
Analysis of current topics in accounting. Topics will vary from term to term.
Equivalent to: BA 529
ACTG 620. FOUNDATIONS OF ACCOUNTING RESEARCH. (3 Credits)
Introduces first-year doctoral students to accounting research by discussing the development of modern accounting theory, relating it to theories in economics and finance, and exposing students to the different areas of and methodologies used in accounting research. Also begins a survey of classic and contemporary literature in the area of financial accounting research. Specific financial accounting topics may change from quarter to quarter, but sample topics include earnings management, earnings quality, and voluntary disclosure.

ACTG 621. FINANCIAL ACCOUNTING RESEARCH. (3 Credits)
Surveys classic and contemporary research in the area of financial accounting. Specific topics may change from quarter to quarter, but sample topics include the value relevance of accounting information, post earnings announcement drift, the residual income model, analysts’ use accounting information, and market-based assessments of the usefulness and limitations of alternative accounting measurements and disclosures.

ACTG 622. ACCOUNTING, JUDGMENT AND ACCOUNTABILITY. (3 Credits)
Surveys classic and contemporary research in areas related to management, judgment, and accountability in accounting. Specific topics may change from quarter to quarter, but sample topics include research on management incentives and compensation, performance measurement, auditing, corporate governance, and research using behavioral methods.

ACTG 623. TAX RESEARCH. (3 Credits)
Surveys classic and contemporary research in the area of taxation. Specific topics may change from quarter to quarter, but sample topics include tax vs. nontax costs in business decisions, book-tax differences, taxes and financial reporting, multijurisdictional tax issues, and tax avoidance.

Business Administration
BA 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

BA 101. BUSINESS NOW. (6 Credits)
Presents an integrated view of both established and entrepreneurial business organizations by studying their common processes and characteristics. Introduces theory and develops basic skills in the areas of management, finance, accounting and marketing. Lec/lab/rec.

BA 140. FINANCIAL LITERACY FOR COLLEGE LIFE. (2 Credits)
Helps you learn the fundamentals of personal finance. It is crucial you are prepared to be prudent managers of your financial resources, enabling you to achieve long- and short-term financial goals and security. In addition, this course will examine how your background experiences, values, goals, and decisions can impact your financial future.

BA 150. EXPLORING ENTREPRENEURSHIP. (1 Credit)
Participants are challenged with economic concepts and projects. Inspirational speakers address key topics concerning all aspects of business and leadership development. Students must be registered for Young Entrepreneurs Business Week Camp to receive credit for the course. Graded P/N.

BA 151. EXPLORING INVESTING. (1 Credit)
Students participating in Investing Week will learn about basic investment vehicles and the principles of evaluating a potential investment. Students will also learn how to understand the financial market system and how it affects their personal and business life. Students will be assigned a role as a junior analyst with Toots, Toots and Peabody, and critically assess the benefits and strengths of individual investment vehicles. Graded P/N.

BA 152. EXPLORING SOCIAL ENTREPRENEURSHIP. (1 Credit)
Provides an immersive experience regarding responsible business practices. In addition, from an entrepreneurial prospective, students have the opportunity to explore ways in which real social change is being conducted worldwide. Graded P/N.

BA 153. EXPLORING FINANCE. (1 Credit)
Students will establish real world financial literacy in a business capacity. Through this course, students will complete a case study involving a business financial plan.

BA 154. EXPLORING MARKETING. (1 Credit)
Students will understand the process of developing and executing a marketing plan in the context of a business model. Each student will participate in a Case Study conducting a small-business-marketing plan.

BA 160. B-ENGAGED. (3 Credits)
Understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Opportunity to connect with faculty and peers with common interests in a supportive learning environment.
Equivalent to: BA 160H, BA 163

BA 160H. B-ENGAGED. (3 Credits)
Understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Opportunity to connect with faculty and peers with common interests in a supportive learning environment.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 160, BA 163

BA 161. INNOVATION NATION--AWARENESS TO ACTION. (3 Credits)
First course in a two-course sequence. Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market. Builds a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career.
Equivalent to: BA 161H, BA 167

BA 161H. INNOVATION NATION--AWARENESS TO ACTION. (3 Credits)
First course in a two-course sequence. Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market. Builds a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 161, BA 167

BA 162. INNOVATION NATION--IDEAS TO REALITY. (3 Credits)
Second course in a two-course sequence. Topics include evaluating entrepreneurial capabilities, creativity and innovation, opportunity recognition, impression management, and responsible business practices. Continues a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market.
Prerequisites: BA 161 with C- or better or BA 161H with C- or better
Equivalent to: BA 162H, BA 168
BA 160, BA 160H

BA 161, BA 161H

BA 162, BA 168

BA 162H. INNOVATION NATION--IDEAS TO REALITY. (3 Credits)
Second course in a two-course sequence. Topics include evaluating entrepreneurial capabilities, creativity and innovation, opportunity recognition, impression management, and responsible business practices. Continues a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 161 with C- or better or BA 161H with C- or better
Equivalent to: BA 162, BA 168

BA 163. B-ENGAGED. (3 Credits)
The first term is a critical time for college students. B-Engaged helps the student transition to the OSU academic community and college learning expectations. B-Engaged will help the student understand and accomplish college-level academic work and explore OSU resources and options that will enhance their college experience and success. Additionally, B-Engaged is the student's opportunity to connect with a faculty member and peers with common interests in a supportive learning environment.
Equivalent to: BA 160, BA 160H

BA 167. LAUNCH PAD I. (3 Credits)
Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market. Focused on building a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career. BA 167/BA 168 presents an integrated view of both established and entrepreneurial business organizations by studying their common processes and characteristics. The series introduces theory and develops basic skills in the areas of management, finance, accounting, and marketing. Departmental approval required.
Equivalent to: BA 161, BA 161H

BA 168. LAUNCH PAD II. (3 Credits)
Continues the conversation on self-management, focused on building a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career. BA 167/BA 168 presents an integrated view of both established and entrepreneurial business organizations by studying their common processes and characteristics. The series introduces theory and develops basic skills in the areas of management, finance, accounting, and marketing. Departmental approval required.
Prerequisites: BA 167 with C- or better
Equivalent to: BA 162, BA 162H

BA 170. BUSINESS INSIGHTS. (2 Credits)
The first term within a new university and/or major is a critical time for college students. Business Insights was developed to help you transition to the OSU College of Business academic community and learning expectations. Business Insights will help you understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Additionally, Business Insights is your opportunity to connect with a faculty member and peers with common interests in a supportive learning environment.
Equivalent to: BA 280

BA 182. FIRST-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 182 – BA 184 is a series of three one-credit courses taken during a student's first year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help the student navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the first-year series provides incoming first-year students with the skills to be successful during college.
BA 182 covers personal development skills; BA 183 covers professional development skills; and BA 184 covers leadership development skills.

BA 183. FIRST-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II. (1 Credit)
BA 182 – BA 184 is a series of three one-credit courses taken during a student's first year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help the student navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the first-year series provides incoming first-year students with the skills to be successful during college.
BA 182 covers personal development skills; BA 183 covers professional development skills; and BA 184 covers leadership development skills.

BA 184. FIRST-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III. (1 Credit)
BA 182 – BA 184 is a series of three one-credit courses taken during a student's first year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help the student navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the first-year series provides incoming first-year students with the skills to be successful during college.
BA 182 covers personal development skills; BA 183 covers professional development skills; and BA 184 covers leadership development skills.

BA 199. SPECIAL STUDIES. (1-6 Credits)
Graded P/N.
This course is repeatable for 12 credits.

BA 210. INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N.
This course is repeatable for 16 credits.

BA 211. FINANCIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of external users, principally investors and creditors. Emphasis on the preparation and interpretation of financial statements, income recognition and determination, and asset valuation.
Prerequisites: (MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better) or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: BA 211H
**BA 211H. FINANCIAL ACCOUNTING. (4 Credits)**
Accounting information from the perspective of external users, principally investors and creditors. Emphasis on the preparation and interpretation of financial statements, income recognition and determination, and asset valuation.

*Attributes: HNRS – Honors Course Designator*

*Prerequisites: MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 60*

*Equivalent to: BA 211*

**BA 213. MANAGERIAL ACCOUNTING. (4 Credits)**
Accounting information from the perspective of management users with an emphasis on data accumulation for product costing, planning, and performance evaluation and control.

*Prerequisites: BA 211 with C- or better or BA 211H with C- or better*

*Equivalent to: BA 213H*

**BA 213H. MANAGERIAL ACCOUNTING. (4 Credits)**
Accounting information from the perspective of management users with an emphasis on data accumulation for product costing, planning, and performance evaluation and control.

*Attributes: HNRS – Honors Course Designator*

*Prerequisites: BA 211 with C- or better or BA 211H with C- or better*

*Equivalent to: BA 213*

**BA 215. FUNDAMENTALS OF ACCOUNTING. (4 Credits)**
Looks at how the accounting model reflects business transactions and events. Students are introduced to both financial and managerial accounting and the creation, interpretation, and analysis of financial statements. In addition, students obtain an understanding of the determination, organization, and management of costs and revenues including management decisions based upon this information.

*Equivalent to: BA 215H, BA 315*

**BA 223. PRINCIPLES OF MARKETING. (4 Credits)**
Covers concepts and principles used by marketing professionals. Designed explicitly for business majors, it’s an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.

*Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better*

*Equivalent to: BA 223H, BA 390, BA 390H*

**BA 223H. PRINCIPLES OF MARKETING. (4 Credits)**
Covers concepts and principles used by marketing professionals. Designed explicitly for business majors, it’s an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.

*Attributes: HNRS – Honors Course Designator*

*Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better*

*Equivalent to: BA 223, BA 390, BA 390H*

**BA 230. BUSINESS LAW I. (4 Credits)**
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.

*Equivalent to: BA 230H, BA 330*

**BA 230H. BUSINESS LAW I. (4 Credits)**
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.

*Attributes: HNRS – Honors Course Designator*

*Equivalent to: BA 230*

**BA 233. LEGAL ENVIRONMENT OF BUSINESS. (2 Credits)**

*Equivalent to: BA 233H*

**BA 233H. LEGAL ENVIRONMENT OF BUSINESS. (2 Credits)**

*Attributes: HNRS – Honors Course Designator*

*Equivalent to: BA 233*

**BA 240. FINANCE. (4 Credits)**
Introduces basic tools of finance and applications of financial theory in use today. These tools include rates of return, the time value of money, those that can be applied to capital budgeting decisions, and the logic and fundamentals of financial statements. It is designed to enhance a student’s approach to financial decision-making and emphasizes quantitative approaches to decision making. This course will also introduce students to equity and debt markets and securities, and serves as a stepping stone to advanced courses in finance.

*Prerequisites: (BA 211 with C- or better or BA 211H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])*

*Equivalent to: BA 240H, BA 360, BA 360H*

**BA 240H. FINANCE. (4 Credits)**
Introduces basic tools of finance and applications of financial theory in use today. These tools include rates of return, the time value of money, those that can be applied to capital budgeting decisions, and the logic and fundamentals of financial statements. It is designed to enhance a student’s approach to financial decision-making and emphasizes quantitative approaches to decision making. This course will also introduce students to equity and debt markets and securities, and serves as a stepping stone to advanced courses in finance.

*Attributes: HNRS – Honors Course Designator*

*Prerequisites: (BA 211 with C- or better or BA 211H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])*

*Equivalent to: BA 240, BA 360, BA 360H*

**BA 253. PROFESSIONAL DEVELOPMENT. (4 Credits)**
Designed to improve the ability of students to describe their accomplishments and sell their ideas in situations like professional networking, company meetings, response to proposals for services, and interviews. It teaches writing skills and workplace integration for new jobs. Particular emphasis is put on verbal communication and preparation for verbal communication. Students will learn to create career plans that require them to research career options and potential employers, and prepare a developmental roadmap that will lead them to success within the chosen profession.

*Prerequisites: (BA 101 with C- or better or BA 162 with C- or better or DHE 160 with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-])*

*Equivalent to: BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253*
BA 253H. PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to improve the ability of students to describe their accomplishments and sell their ideas in situations like professional networking, company meetings, response to proposals for services, and interviews. It teaches writing skills and workplace integration for new jobs. Particular emphasis is put on verbal communication and preparation for verbal communication. Students will learn to create career plans that require them to research career options and potential employers, and prepare a developmental roadmap that will lead them to success within the chosen profession.

Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 101 with C- or better or BA 162 with C- or better or DHE 160 with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-])
Equivalent to: BA 253, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 260. INTRODUCTION TO ENTREPRENEURSHIP. (4 Credits)
Topics include evaluating entrepreneurial capabilities, creativity, business plan creation, opportunity assessment and feasibility analysis, business implementation, new product introduction, and seeking funds.

Equivalent to: BA 260H

BA 260H. INTRODUCTION TO ENTREPRENEURSHIP. (4 Credits)
Topics include evaluating entrepreneurial capabilities, creativity, business plan creation, opportunity assessment and feasibility analysis, business implementation, new product introduction, and seeking funds.

Attributes: HNRS – Honors Course Designator
Equivalent to: BA 260

BA 270. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Introduces and integrates some core concepts from Operations Management (OM) and Business Information System (BIS) disciplines by introducing a process-oriented view of the flows of materials, information, products and services through and across organizational functions. Helps students to: identify information-bearing events and actors, model and analyze business processes, assess and improve process efficiency, recognize probabilistic components of business processes and understand the interactions between human behavior and process design. Hands-on, case-based assignments allow for practicing some principles and concepts addressed in the course.

Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 270H, BA 302, BA 302H

BA 270H. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Introduces and integrates some core concepts from Operations Management (OM) and Business Information System (BIS) disciplines by introducing a process-oriented view of the flows of materials, information, products and services through and across organizational functions. Helps students to: identify information-bearing events and actors, model and analyze business processes, assess and improve process efficiency, recognize probabilistic components of business processes and understand the interactions between human behavior and process design. Hands-on, case-based assignments allow for practicing some principles and concepts addressed in the course.

Attributes: HNRS – Honors Course Designator
Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 270, BA 302, BA 302H

BA 272. BUSINESS APPLICATION DEVELOPMENT. (4 Credits)
Introduction to business programming with C#.NET. Beginning programming skills and concepts, .NET programming environment, object-oriented and event-oriented models, and console applications.

BA 275. FOUNDATIONS OF STATISTICAL INFERENCE. (4 Credits)
An introductory course on statistical inference with an emphasis on business applications. Coverage includes descriptive statistics, random variables, probability distributions, sampling and sampling distributions, statistical inference for means and proportions using one and two samples, and linear regression analysis.

Prerequisites: MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or Math Placement - ALEKS with a score of 046
Equivalent to: BA 275H, BA 276

BA 275H. FOUNDATIONS OF STATISTICAL INFERENCE. (4 Credits)
An introductory course on statistical inference with an emphasis on business applications. Coverage includes descriptive statistics, random variables, probability distributions, sampling and sampling distributions, statistical inference for means and proportions using one and two samples, and linear regression analysis.

Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or MTH 251 with C- or better or Math Placement - ALEKS with a score of 046
Equivalent to: BA 275, BA 276

BA 276. INTRODUCTION TO STATISTICAL INFERENCE. (2 Credits)
An introductory level statistics course on data analysis and statistical inference with an emphasis on business applications. Coverage includes descriptive statistics, random variables, probability distributions, sampling and sampling distributions, statistical inference for means and proportions using one and two samples. It serves as a prerequisite to BA 376.

Prerequisites: MTH 245 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better
Equivalent to: BA 275, BA 275H

BA 280. BUSINESS INSIGHTS. (2 Credits)
Connect with faculty and peers and explore OSU resources designed to enhance your college experience and success. Engage in professional development activities and cultivate the soft skills employers are looking for in their future employees.

Equivalent to: BA 170

BA 281. PROFESSIONAL DEVELOPMENT. (3 Credits)
Designed to give students an early start on the process of career planning and development. The process involves thoughtful self-assessment, career exploration, planning and follow-through with preliminary employment strategies.

Prerequisites: (BA 101 with C- or better and BA 280 [C-]) or BA 162 [C-] or BA 162H [C-]
Equivalent to: BA 253, BA 253H, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 281H. PROFESSIONAL DEVELOPMENT. (3 Credits)
Designed to give students an early start on the process of career planning and development. The process involves thoughtful self-assessment, career exploration, planning and follow-through with preliminary employment strategies.

Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 101 with C- or better and BA 280 [C-]) or BA 162 [C-] or BA 162H [C-]
Equivalent to: BA 253, BA 253H, BA 281, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253
BA 282. PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 282, taken during fall term of the second year, helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student's ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: DSGN 282

BA 283. CREATIVITY, CULTURE, AND THE WORKPLACE. (1 Credit)
Part of Blueprint – a 12 course professional development course series to guide the student from college to career. Topics include exploration of students' unique talents; understanding of how teams as well as organizations can benefit from diverse and inclusive communities.
Equivalent to: DSGN 283

BA 284. PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III. (1 Credit)
BA 284, taken during spring term of the second year, course helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student's ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: DSGN 284

BA 290. INTRODUCTION TO CAREERS IN MARKETING. (3 Credits)
Explores marketing through the perspectives of current marketing professionals. Introductory language and principles of marketing are introduced and examined through real world examples. Presents various careers within marketing.

BA 291. BLUEPRINT - TRANSFER TRANSITIONS - SECOND YEAR FALL EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a 'welcome to the College of Business' component, and Professional Development content, including business writing and verbal communication. Appropriate for second year external transfer students matriculating to the College in the Fall term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 294, BA 295, BA 353, BA 382, BA 384, BA 385, DSGN 253

BA 293. BLUEPRINT-TRANSFER TRANSITIONS-SECOND YEAR SPRING EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a 'welcome to the College of Business' component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture. Appropriate for second year external transfer students matriculating to the College in the Spring term.

BA 294. BLUEPRINT - TRANSFER TRANSITIONS - SECOND YEAR FALL INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a 'welcome to the College of Business' component, and Professional Development content, including business writing and verbal communication. Appropriate for second year internal transfer students matriculating to the College in the Fall term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 295. BLUEPRINT - TRANSFER TRANSITIONS - SECOND YR WINTER INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a 'welcome to the College of Business' component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis. Appropriate for second year internal transfer students matriculating to the College in the Winter term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 296. BLUEPRINT-TRANSFER TRANSITIONS-SECOND YEAR SPRING INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a 'welcome to the College of Business' component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture. Appropriate for second year internal transfer students matriculating to the College in the Spring term.

BA 302. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Integrates core concepts from Business Information Systems (BIS) with those of Operations Management and introduces a process-oriented view of the flows of materials, information and services through and across organizations. The course helps students identify information-bearing events, assess and improve process efficiency, learn to model and analyze business processes, and understand the interactions between human behavior and process design. Hands-on, case-based assignments and labs allow students to practice the principles addressed.
Prerequisites: BA 275 with C- or better or BA 276 with C- or better
Equivalent to: BA 270, BA 270H, BA 302H

BA 302H. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Integrates core concepts from Business Information Systems (BIS) with those of Operations Management and introduces a process-oriented view of the flows of materials, information and services through and across organizations. The course helps students identify information-bearing events, assess and improve process efficiency, learn to model and analyze business processes, and understand the interactions between human behavior and process design. Hands-on, case-based assignments and labs allow students to practice the principles addressed.
Prerequisites: BA 275 with C- or better or BA 276 with C- or better
Equivalent to: BA 270, BA 270H, BA 302

BA 311. THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 311 – BA 313 is a series of three one-credit courses taken during a student's third year. These courses, along with the respective 1st, 2nd and 4th year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the third-year series provides students with skills related to team work and team leadership. BA 311 focuses on diversity and inclusion; BA 312 focuses on teamwork and career preparation; and BA 313 focuses on team leadership.
BA 312. THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II. (1 Credit)
BA 311 – BA 313 is a series of three one-credit courses taken during a student’s third year. These courses, along with the respective 1st, 2nd and 4th year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third-year series provides students with skills related to team work and team leadership. BA 311 focuses on diversity and inclusion; BA 312 focuses on teamwork and career preparation; and BA 313 focuses on team leadership.

BA 313. THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III. (1 Credit)
BA 311 – BA 313 is a series of three one-credit courses taken during a student’s third year. These courses, along with the respective 1st, 2nd and 4th year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third-year series provides students with skills related to team work and team leadership. BA 311 focuses on diversity and inclusion; BA 312 focuses on teamwork and career preparation; and BA 313 focuses on team leadership.

BA 314. SUSTAINABLE BUSINESS OPERATIONS. (4 Credits)
Operations are the processes by which an organization transforms inputs (e.g., labor, material, and knowledge) into outputs (products and services). Operations managers are responsible for designing, running and improving the processes and systems to efficiently accomplish this for production or service businesses. This course focuses on the concepts and tools employed by operations managers to provide their organization a competitive advantage. Topics include statistical tools and quantitative methods (descriptive statistics, probabilities, sampling, interval estimation and hypothesis testing) and operations management concepts (strategies, forecasting, process design, capacity utilization, quality systems, supply chain management, inventory management, resource planning, sustainability and lean systems.)

BA 315. ACCOUNTING FOR DECISION MAKING. (4 Credits)
Looks at how the accounting model reflects business transactions and events. Students are introduced to both financial and managerial accounting and the creation, interpretation, and analysis of financial statements. In addition, students obtain an understanding of the determination, organization, and management of costs and revenues including management decisions based upon this information.
Equivalent to: BA 215
Recommended: Third-year (junior) standing

BA 330. LEGAL ENVIRONMENT OF BUSINESS. (4 Credits)
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.
Equivalent to: BA 230, BA 230H
Recommended: Third-year (junior) standing

BA 333. LEGAL AND ETHICAL BUSINESS SOLUTIONS. (2 Credits)
Legal and ethical regulations of U.S. and global business organizations including financial, human resources, operations and marketing functions. Emphasizes legal and ethical strategies for entrepreneurs including business entity selection, raising capital and managing intellectual property.
Prerequisites: (BA 230 with C- or better or BA 233 with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 333H

BA 333H. LEGAL AND ETHICAL BUSINESS SOLUTIONS. (2 Credits)
Legal and ethical regulations of U.S. and global business organizations including financial, human resources, operations and marketing functions. Emphasizes legal and ethical strategies for entrepreneurs including business entity selection, raising capital and managing intellectual property.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 230 with C- or better or BA 233 with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 333

BA 347. INTERNATIONAL BUSINESS. (4 Credits)
Integrated view of international business including current patterns of international business, socioeconomic and geopolitical systems within countries as they affect the conduct of business, major theories explaining international business transactions, financial forms and institutions that facilitate international transactions, and the interface between nation states and the firms conducting foreign business activities.
Prerequisites: (ECON 202 with C- or better or ECON 202H with C- or better) and (BA 230 [C-] or BA 230H [C-] or BA 330 [C-])
Equivalent to: BA 347H

BA 347H. INTERNATIONAL BUSINESS. (4 Credits)
Integrated view of international business including current patterns of international business, socioeconomic and geopolitical systems within countries as they affect the conduct of business, major theories explaining international business transactions, financial forms and institutions that facilitate international transactions, and the interface between nation states and the firms conducting foreign business activities.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ECON 202 with C- or better or ECON 202H with C- or better) and (BA 230 [C-] or BA 230H [C-] or BA 330 [C-])
Equivalent to: BA 347

BA 348. INTERNATIONAL EXCHANGE ORIENTATION. (1 Credit)
Consists of large-group sessions as well as small-group break-out sessions for each country individually. It is vital to attend all sessions as valuable information pertaining to your study abroad opportunity will be presented. Graded P/N.

BA 349. IMPACT OF CULTURE ON BUSINESS. (1 Credit)
A requirement of all students participating in a College of Business-approved international exchange program and for completing the College of Business International Business option. The major emphasis is for students to reflect on their experience while studying, living and traveling in a foreign culture and for them to determine how the foreign culture impacts how they would conduct business in that country. Graded P/N.
Prerequisites: BA 348 (may be taken concurrently) with C- or better

BA 351. MANAGING ORGANIZATIONS. (4 Credits)
A systems perspective to understanding the management functions of planning, organizing, leading and controlling. Ethical and diversity issues are addressed as they are relevant in entrepreneurial and established ventures.
BA 352. MANAGING INDIVIDUAL AND TEAM PERFORMANCE. (4 Credits)
Diagnose individual and small-group behavior and develop skill in improving individual and small-group performance in entrepreneurial and established ventures. Emphasis on professional skill development and the practical application of theory and research. Concepts of ethics, diversity and cross-cultural relations are integrated throughout the course.
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 352H

BA 352H. MANAGING INDIVIDUAL AND TEAM PERFORMANCE. (4 Credits)
Diagnose individual and small-group behavior and develop skill in improving individual and small-group performance in entrepreneurial and established ventures. Emphasis on professional skill development and the practical application of theory and research. Concepts of ethics, diversity and cross-cultural relations are integrated throughout the course.
Attributes: HNRS – Honors Course Designator
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 352

BA 353. *PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to improve the ability of students to describe their accomplishments and sell themselves in situations like professional networking, company meetings, response to proposals for services, and interviews. Emphasizes writing skills, workplace integration, verbal communication, and preparation of developmental roadmaps that will lead students to success within their chosen profession. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 381, BA 382, BA 384, BA 385, DSGN 253
Recommended: Junior standing

BA 354. *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces contemporary issues that business professionals face making ethical and socially responsible decisions in an increasingly fast-paced, transparent, and global environment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 354H, MGMT 459

BA 354H. *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces contemporary issues that business professionals face making ethical and socially responsible decisions in an increasingly fast-paced, transparent, and global environment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 354, MGMT 459

BA 357. OPERATIONS MANAGEMENT. (4 Credits)
Decision making in managing the production of goods and services: product planning, process planning, facility planning, control of quantity, cost and quality. Special emphasis on exponential forecasting, inventory management, work methods, project management, productivity improvement, and international comparisons.
Prerequisites: BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better
Equivalent to: BA 357H

BA 357H. OPERATIONS MANAGEMENT. (4 Credits)
Decision making in managing the production of goods and services: product planning, process planning, facility planning, control of quantity, cost and quality. Special emphasis on exponential forecasting, inventory management, work methods, project management, productivity improvement, and international comparisons.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better
Equivalent to: BA 357

BA 360. INTRODUCTION TO FINANCIAL MANAGEMENT. (4 Credits)
Explore the issues facing a financial manager in new business ventures, small businesses, and corporations. Focus on the role of the financial manager in business settings, explores the functions of a financial manager in financial analysis, forecasting, planning, and control; asset and liability management; capital budgeting; and raising funds for new business ventures, small businesses, and corporations.
Prerequisites: (BA 213 with C- or better or BA 213H with C- or better or BA 215 with C- or better or BA 215H with C- or better or BA 315 with C- or better) and (ECON 201 [C-] or ECON 201H [C-] or AEC 250 [C-] or AEC 250H [C-])
Equivalent to: BA 240, BA 240H, BA 360H

BA 360H. INTRODUCTION TO FINANCIAL MANAGEMENT. (4 Credits)
Explore the issues facing a financial manager in new business ventures, small businesses, and corporations. Focus on the role of the financial manager in business settings, explores the functions of a financial manager in financial analysis, forecasting, planning, and control; asset and liability management; capital budgeting; and raising funds for new business ventures, small businesses, and corporations.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 213 with C- or better or BA 213H with C- or better or BA 215 with C- or better or BA 215H with C- or better or BA 315 with C- or better) and (ECON 201 [C-] or ECON 201H [C-] or AEC 250 [C-] or AEC 250H [C-])
Equivalent to: BA 240, BA 240H, BA 360
BA 362. SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES. (4 Credits)
The core concepts of entrepreneurship, using entrepreneurship to craft innovative responses to social problems. Entrepreneurial skills are as valuable in the social sector as they are in business. Includes both profit and non-profit firms that have programs designed to create social value.

BA 363. TECHNOLOGY AND INNOVATION MANAGEMENT. (4 Credits)
Introduces students to the fundamentals of managing innovation and technology toward the production of intellectual assets; how innovations are created, evaluated and leveraged within business strategy; and how innovation is managed within various business environments.

**Prerequisites:** BA 260 with C- or better or BA 260H with C- or better

BA 365. FAMILY BUSINESS MANAGEMENT. (4 Credits)
Focuses on the opportunities and the problems characteristic of family businesses: entrepreneurship, management succession, transfer of ownership, mixing family and business roles, family conflicts, personnel issues, non-family employees, and outside advisors.

BA 367. LAUNCH ACADEMY. (3 Credits)
The Oregon State Launch Academy is an incubator for student entrepreneurs who want to be immersed in an innovative, high-energy environment that promotes the creation, evolution and implementation of business ideas. Launch Academy students earn academic credit for working on their businesses and have access to seed funding, prototyping equipment, co-working space, mentoring and training to help them advance their ideas. Launch Academy students learn about developing new products or services, marketing their ideas, building teams and securing funding, among other critical elements of entrepreneurial success.

BA 368. ADVANCED LAUNCH ACADEMY. (1-3 Credits)
The Oregon State Launch Academy is an incubator for student entrepreneurs who want to be immersed in an innovative, high-energy environment that promotes the creation, evolution and implementation of business ideas. Launch Academy students earn academic credit for working on their businesses and have access to seed funding, prototyping equipment, co-working space, mentoring and training to help them advance their ideas. In BA 368 Advanced Launch Academy students/teams will receive coaching from the instructor to move their business ideas forward. Students will secure and engage mentors, complete and test prototypes of their ideas, market their ideas, and prepare to secure funding for their ideas. Graded P/N.

**Prerequisites:** BA 367 with C- or better

*This course is repeatable for 12 credits.*

BA 370. BUSINESS INFORMATION SYSTEMS OVERVIEW. (4 Credits)
Introduce students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, and the development and implementation of information systems. Use relational database models to design a real-world case study.

**Prerequisites:** BA 270 with C- or better or BA 270H with C- or better or BA 302 with C- or better

BA 371. BUSINESS DATA MANAGEMENT. (4 Credits)
Exploration of business data management technologies including but not limited to relational database modeling, data retrieval, database triggers and stored procedures, NoSQL databases, programmatic database querying.

**Prerequisites:** BA 272 with C- or better and (ACTG 378 [C-] or ACTG 378H [C-] or BA 370 [C-])

BA 372. BUSINESS INFORMATION SYSTEMS DESIGN AND DEVELOPMENT. (4 Credits)
Logical and physical design of computer-based information systems; tools and techniques that underlie the design processes. Design of an enterprise information system with CASE tools. Alternative approaches to systems design with emphasis on object-orientation. Lec/rec.

**Prerequisites:** BA 272 with C- or better and (ACTG 378 [C-] or ACTG 378H [C-] or BA 370 [C-])

**Recommended:** BA 371

BA 375. APPLIED QUANTITATIVE METHODS. (4 Credits)
Introduces students to the basics of data science and data analytics for handling of large-scale databases. It provides an overview of the main data-analytic techniques and topics including data visualization, linear and nonlinear regression analysis, time series analysis and forecasting, classification, and clustering methods.

**Prerequisites:** BA 275 with C- or better or BA 275H with C- or better

**Equivalent to:** BA 375H

BA 375H. APPLIED QUANTITATIVE METHODS. (4 Credits)
Introduces students to the basics of data science and data analytics for handling of large-scale databases. It provides an overview of the main data-analytic techniques and topics including data visualization, linear and nonlinear regression analysis, time series analysis and forecasting, classification, and clustering methods.

**Attributes:** HNRS – Honors Course Designator

**Prerequisites:** BA 275 with C- or better or BA 275H with C- or better

**Equivalent to:** BA 375

BA 376. APPLIED QUANTITATIVE METHODS. (2 Credits)
An in-depth discussion on advanced quantitative methods most relevant to business students. Topics may include regression analysis, time series and forecasting, design of experiments, simulations, decision analysis, survey data analysis, data mining and computationally intensive statistical methods.

**Prerequisites:** BA 276 with C- or better

BA 381. PERSONAL AND PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to help students transition to the OSU and COB communities, identify and employ academic success strategies, and start the process of career planning and development. Teaches students how to set financial goals. Credit may not be received for equivalent courses BA 353 or BA 253.

**Prerequisites:** BA 101 with C- or better

**Equivalent to:** BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 382, BA 384, BA 385, DSGN 253

BA 382. BLUEPRINT - TRANSFER TRANSITIONS - THIRD YR WINTER EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a 'welcome to OSU and College of Business' component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit. Appropriate for third year external transfer students matriculating to the College in the Winter term.

**Equivalent to:** BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 384, BA 385, DSGN 253
BA 383. BLUEPRINT-TRANSFER TRANSITIONS-THIRD YEAR SPRING EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to OSU and College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit; Investing, Taxes, Credit/Banking. Appropriate for third year external transfer students matriculating to the College in the Spring term.

BA 384. BLUEPRINT - TRANSFER TRANSITIONS - THIRD YEAR FALL INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; and Paying for College. Appropriate for third year internal transfer students matriculating to the College in the Fall term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 385, DSGN 253

BA 385. BLUEPRINT - TRANSFER TRANSITIONS - THIRD YR WINTER INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit. Appropriate for third year internal transfer students matriculating to the College in the Winter term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, DSGN 253

BA 386. BLUEPRINT-TRANSFER TRANSITIONS-THIRD YEAR SPRING INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit; Investing, Taxes, Credit/Banking. Appropriate for third year internal transfer students matriculating to the College in the Spring term.

BA 390. MARKETING. (4 Credits)
Consumer and industrial markets, and activities and enterprises involved in distributing products to those markets. Objective is to develop an understanding of distribution processes, marketing problems, and marketing principles.
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better or (AREC 250 with C- or better or AEC 250 with C- or better)
Equivalent to: BA 223, BA 223H, BA 390H

BA 390H. MARKETING. (4 Credits)
Consumer and industrial markets, and activities and enterprises involved in distributing products to those markets. Objective is to develop an understanding of distribution processes, marketing problems, and marketing principles.
Attributes: HNRS – Honors Course Designator
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better or (AREC 250 with C- or better or AEC 250 with C- or better)
Equivalent to: BA 223, BA 223H, BA 390

BA 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BA 405. READING AND CONFERENCE. (1-16 Credits)
Supervised individual work in some field of special application and interest. Subjects chosen must be approved by professor in charge. This course is repeatable for 16 credits.

BA 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

BA 407. SEMINAR. (1-16 Credits)
Equivalent to: BA 407H
This course is repeatable for 16 credits.

BA 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 407
This course is repeatable for 16 credits.

BA 410. BUSINESS INTERNSHIP. (1-12 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N. This course is repeatable for 16 credits.

BA 411. FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 411–BA 413 is a series of three one-credit courses taken during a student’s fourth year. These courses, along with the respective 1st, 2nd and 3rd year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth-year series continues to provide students with career-related skills, and provides students with skills to be successful in life. BA 411 focuses on career placement skills; BA 412 focuses on self-leadership; and BA 413 focuses on work-life balance, financial literacy, and networking.

BA 412. THE DESIGN THINKING CHALLENGE. (1 Credit)
Part of Blueprint – a 12 course professional development course series to guide the student from college to career. Topics include basic methodologies of design thinking and integration of design thinking into business processes. Participation in a cross-campus Design Thinking Challenge.

BA 413. FINANCIAL PLANNING II. (1 Credit)
Part of Blueprint – a 12 course professional development course series to guide the student from college to career. Fourth of four courses dedicated to the foundations of professional financial planning so the student can have the tools needed to successfully manage their career pathway.
Equivalent to: DSGN 413

BA 432. ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS. (3 Credits)
Explores fundamental business, legal, and policy issues raised by environmental law, sustainable business practices, and clean energy policies, and their impact on business and management practices.
Attributes: CSGI – Core, Synth, Global Issues

BA 447. TOPICS IN INTERNATIONAL BUSINESS. (1-4 Credits)
Analysis of current topics in international business. Topics will vary from term to term.
Prerequisites: BA 347 with C- or better or BA 347H with C- or better
BA 451. SUPPLY AND SOURCING MANAGEMENT. (3 Credits)
Focus on effectively using operations and supply chain management to make sourcing and supply decisions in international business contexts. Topics include purchasing/procurement procedures and policy, supply organization, specifications, sourcing strategy, supplier evaluation, competitive bidding, and e-procurement. Global contexts and environmentally and socially responsible supply management are emphasized.
Prerequisites: BA 357 with C- or better or BA 357H with C- or better

BA 454. LEAN ENTERPRISE MANAGEMENT AND CAPSTONE. (3 Credits)
Analyze business cases that address global value creation and production/delivery systems. Complete integrated business projects to identify critical operations and supply chain management issues, apply multidisciplinary knowledge, analyze and evaluate alternative solutions and write and present reports recommending firm strategies. International business and cross-cultural competencies are emphasized.
Prerequisites: BA 459 with C- or better and MGMT 457 [C-]

BA 458. INNOVATION AND NEW PRODUCT DEVELOPMENT. (4 Credits)
Strategic management of an organization's system and technologies in support of innovation and new product/service development. Application experience with new product/service development process using problem solving skills, information management, and critical thinking.
Prerequisites: BA 223 with C- or better or BA 223H with C- or better or BA 390 with C- or better or BA 390H with C- or better

BA 459. SERVICE OPERATIONS MANAGEMENT. (3 Credits)
Focus on the management of global service operations including designing and managing systems to coordinate global information and material flows within and between firms in a supply chain. Covers planning operations, evaluating system alternatives, designing and researching global supply networks, examining complex adaptive systems and evaluating value stream synchronization.
Prerequisites: (BA 375 with C- or better or BA 375H with C- or better) and BA 451 [C-]

BA 460. VENTURE MANAGEMENT. (4 Credits)
Entrepreneurial and innovation processes applied to new business start-ups, existing small businesses, and new ventures within larger organizations; new venture planning, project management, and productivity improvement. Cases and projects are used to apply concepts and to develop communication skills.
Prerequisites: (BA 260 with C- or better or BA 260H with C- or better) and (BA 351 [C-] or BA 352 [C-] or BA 352H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-])

BA 463. FAMILY ENTERPRISE GOVERNANCE. (4 Credits)
Builds on the introductory family business management course to examine the required elements of a successful enterprise, a diversified and multigenerational organization comprised of multiple business lines.
Prerequisites: BA 365 with C- or better

BA 464. NEW VENTURE FINANCING. (4 Credits)
Explore financial issues facing entrepreneurial business ventures: cash flow and budgets, financial analysis, financial statement forecasting, financial controls, asset management, and understanding the funding options at different points in the business life cycle including SBA loans, angel investment, venture capital, bank loans, and going public.
Prerequisites: (BA 260 with C- or better or BA 260H with C- or better) and (BA 240 [C-] or BA 240H [C-] or BA 360 [C-] or BA 360H [C-] or FIN 340 [C-] or FIN 340H [C-])

BA 465. *SYSTEMS THINKING AND PRACTICE. (4 Credits)
Hard and soft system theories examined, methods and techniques for dealing with real-world problems; skills and dialogue techniques to identify mindsets, define problems, and explore alternative pathways for solutions. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: BA 465H, ENGR 465, H 490, HORT 490

BA 465H. *SYSTEMS THINKING AND PRACTICE. (4 Credits)
Hard and soft systems theories are examined, including methods and techniques for dealing with real-world problems; skills and dialogue techniques to identify mindsets, define problems, and explore alternative pathways for solutions.
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: BA 465

BA 466. INTEGRATIVE STRATEGIC EXPERIENCE. (4 Credits)
Provides students with an overview of the basic concepts in strategic management. Students learn frameworks and models to understand and analyze a firm's external environment and internal resources in an effort to create sustainable competitive advantages. Analysis and critique of conventional conceptions of business ethics. Evaluation of ethical issues involving businesses at firm, national, and international levels.
Prerequisites: ((BA 240 with C- or better or BA 240H with C- or better or FIN 340 with C- or better or FIN 340H with C- or better or BA 360 with C- or better or BA 360H with C- or better) and (BA 352 [C-] or BA 352H [C-]) and (BA 357 [C-] or BA 357H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-]))
Equivalent to: BA 466H

BA 466H. INTEGRATIVE STRATEGIC EXPERIENCE. (4 Credits)
Provides students with an overview of the basic concepts in strategic management. Students learn frameworks and models to understand and analyze a firm's external environment and internal resources in an effort to create sustainable competitive advantages. Analysis and critique of conventional conceptions of business ethics. Evaluation of ethical issues involving businesses at firm, national, and international levels.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BA 240 with C- or better or BA 240H with C- or better or FIN 340 with C- or better or FIN 340H with C- or better or BA 360 with C- or better or BA 360H with C- or better) and (BA 352 [C-] or BA 352H [C-]) and (BA 357 [C-] or BA 357H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-]))
Equivalent to: BA 466

BA 467. NEW VENTURE LABORATORY. (4 Credits)
Entrepreneurship capstone course. Fully develop a business plan including product specs with prototype, financial analysis, market analysis, marketing plan, management structure and proposed financing.
Prerequisites: (BA 387 with C- or better or BA 357H with C- or better) and BA 458 [C-]
Equivalent to: ENGR 467

BA 468. TECHNOLOGY COMMERCIALIZATION. (2-4 Credits)
'Hands on' class in which students will exercise commercialization concepts on recently awarded Oregon State University patents or individual commercialization projects. Students will learn a process and tools to assess the business viability of a technical idea, and to develop the best business approach for commercialization.
Prerequisites: BA 363 with C- or better
Equivalent to: BA 468X
This course is repeatable for 8 credits.
BA 474. DATA MANAGEMENT. (3 Credits)
Familiarize students with the major activities involved in collecting and managing data for a data analytics project, including extracting information from relational databases, mapping organizational requirements into a data design, transforming data into information, and exploring basic concepts underlying noSQL data management and analysis methods.
Prerequisites: BA 481 with C- or better or BA 483 with C- or better

BA 475. DATA EXPLORATION AND VISUALIZATION. (3 Credits)
Exploring and visualizing data in business analytics projects. We will focus on exploring and wrangling data to discover interesting analysis questions and prepare for other analytics activities. We will pay special attention to data visualization methods and their overall place in data science and business analytics.
Prerequisites: BA 474 with C- or better or BA 483 with C- or better

BA 476. DATA AND TEXT MINING. (3 Credits)
Introduces the concepts and applications of data and text mining. As the core of business analytics, mining structured and unstructured information is critical for better decision making by deriving valuable insights from your enterprise data repositories regardless of source or format. It allows deep, rich analysis of information. Data/text mining can help organizations surface undetected problems, fix process inefficiencies, improve customer service and corporate accountability, reduce operating costs and risks and discover new revenue opportunities. Student groups will implement a comprehensive project of data/text analytics.
Prerequisites: BA 474 with C- or better and BA 475 [C]

BA 478. SUPPLY CHAIN ANALYTICS. (3 Credits)
Explores modeling methods for design, analysis, execution and integration of supply chains. Introduces students to a variety of modeling and optimization techniques for the analysis of strategic, tactical and operational supply chain problems, including demand forecasting, risk analysis, revenue management, distribution and facility location.
Prerequisites: (BA 357 with C- or better or BA 357H with C- or better) and (BA 375 [C-] or BA 375H [C-])

BA 479. BUSINESS TELECOMMUNICATIONS AND NETWORKING. (4 Credits)
Provide a fundamental understanding of the five-layer Internet model and its effects on the business environment. Planning and managing networks in support of enterprise-wide computing. Assignments involve server hardware and software configurations including DNS/DHCP server configurations, addition of clients to a network, and creating/managing user accounts.
Prerequisites: ACTG 378 with C- or better or ACTG 378H with C- or better

BA 480. INFORMATION SYSTEMS SECURITY. (4 Credits)
Course emphasis is on security risk mitigation methods and procedures such as access control, identity management, intrusion prevention and detection, network and physical security, etc. These and other topics will be placed in both the operational and strategic context of the business. The course also addresses several IS governance and IS security frameworks within which the various security concepts, aspects, policies and procedures can be viewed and discussed.
Prerequisites: BA 272 with C- or better and (ACTG 378 [C-] or ACTG 378H [C-]) and BA 479 [C-]

BA 481. INTRODUCTION TO BUSINESS ANALYTICS. (4 Credits)
How organizations can successfully collect, evaluate and apply information for better decision making. Emerging technologies such as transaction processing systems, RFID, weblogs, social networks, website usage, and online communities have the potential to reveal market trends, suppliers’ preferences, and competitors’ next moves. The success of an organization largely depends on its ability to take advantage of those data sets that are already available to it. The class starts with basic IT strategy concepts for the identification of the opportunities for BI solutions, and ends with hands-on experience using Business Intelligence tools to implement such solutions.
Equivalent to: BA 483

BA 482. INFORMATION SECURITY GOVERNANCE. (4 Credits)
As a discipline cybersecurity covers software, hardware, networking, systems, individuals, organizations and applicable policies, laws and standards, among others. Given societies’ dependence on the security of global infrastructure and the increasing complexity of maintaining the security of those systems, there is a growing need for an interdisciplinary approach to study this topic. This course introduces several well-regarded and well-used IT and IT security governance frameworks which can be used to apply and govern security policies and protocols in organizations. The course also delves into SOC IT auditing.

BA 483. BUSINESS ANALYTICS. (4 Credits)
Presents how organizations can successfully collect, evaluate and apply information for better decision making. Technologies such as transaction processing systems, RFID, weblogs, social networks, website usage, and online communities have the potential to reveal market trends, suppliers’ preferences, and competitors’ next moves. The success of an organization largely depends on its ability to take advantage of those data sets that are already available to it.
Prerequisites: BA 371 with C- or better and BA 479 [C-]
Equivalent to: BA 481

BA 487. HOSPITALITY FINANCIAL MANAGEMENT. (4 Credits)
Introduces students to the evaluation of investments in competitive products and services as sustainable strategies for the hospitality industry.
Prerequisites: BA 360 with C- or better and BA 486 [C-]

BA 488. ADVANCED HOSPITALITY MANAGEMENT. (4 Credits)
Designed to provide students with an in-depth understanding of the importance of core competencies in the hospitality industry in terms of overall value addition, competitive methods, and competitive advantage, taking into consideration both present and future effects.
Prerequisites: BA 352 with C- or better

BA 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BA 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BA 504. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

BA 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

BA 510. BUSINESS INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conferences, reports, and appraisals.
This course is repeatable for 16 credits.
BA 512. BUSINESS ANALYSIS AND COMMUNICATION. (6 Credits)
Students will be guided through a process of determining business issues or challenges given specific situations, providing reasons/justifications why these are important, proposing solutions to the identified business problems, and communicating this analysis through in-class discussions and writing.
Recommended: ALS 162 with a minimum grade of B

BA 513. BUSINESS LEGAL ENVIRONMENT. (3 Credits)
Provides the essential legal foundation for business managers in companies operating in the U.S. Effective strategies for managers to prevent and resolve legal disputes will be stressed. Topics include legal issues related to corporate forms, creating and enforcing contracts, reducing exposure to tort liability and the role of employees as agents of a business.

BA 514. OPERATIONS MANAGEMENT. (3 Credits)
Provides a foundation for business managers in statistics and operations management. Emphasis on quantitative tools for sampling, interval estimation and hypothesis testing as well as operations management concepts for processes, quality systems, supply chain management, inventory management, resource planning, and sustainable lean systems.
Recommended: College algebra (including probabilities).

BA 515. MANAGERIAL DECISION TOOLS. (3 Credits)
Develop business management skills by learning the principles of managerial and financial accounting. Emphasis will be placed on understanding financial statements, cost analysis, and funding decisions. Focuses on integrating the theoretical framework of accounting and finance with the “hands on” technical skills needed to evaluate financial decisions within an organization.
Recommended: College algebra.

BA 516. CREATING VALUE IN EXCHANGE. (3 Credits)
A graduate-level survey course that provides a foundation for business managers in the concepts of marketing. The student will develop an understanding of marketing principles and an awareness of marketing challenges.
Recommended: Microeconomics

BA 517. MARKETS AND VALUATION. (3 Credits)
Introduces students to the basic questions facing a financial manager and the tools a financial manager uses to find answers to these questions. Introduces the basic tools of finance and applications of financial theory in use today. Students will be introduced to legal, ethical, technology, and global issues facing a financial manager. The course is designed to enhance a student’s approach to financial decision making and emphasizes technical analysis and quantitative approaches to decision making.

BA 518. ADOPTING THE ENTREPRENEURIAL MINDSET. (3 Credits)
Introduces the fundamentals of entrepreneurship and innovation, and exposes the concepts, practice, and tools of the entrepreneurial world.

BA 528. FINANCIAL AND COST ANALYSIS. (3 Credits)
Analysis of the balance sheet and income statement to determine profitability, risk, and rate of return; preparation of pro forma financial statements; cost measurement for products, projects, jobs, customers, and markets; strategic cost decision making for pricing and resource allocation.
Recommended: BA 213 with a grade of C- or higher

BA 531. BUSINESS LAW - TECHNOLOGY/NEW VENTURES. (3 Credits)
An integrative course on managing legal and ethical issues for new ventures. Focuses on business law for founders of start-up companies including formation of new business entities, protecting intellectual property, workforce management and global issues. Topics presented from an entrepreneurial perspective and include technology law, e-commerce law and government regulation. Students develop skills to identify and resolve legal and ethical issues, deal with administrative agencies, and proactively manage legal liability. Considerations of ethics and corporate responsibility are emphasized.
Recommended: BA 230 or BA 330 or BA 513 with a minimum grade of B-

BA 532. ENVIRONMENTAL LAW, SUSTAINABILITY, AND BUSINESS. (4 Credits)
Explores fundamental business, legal, and policy issues raised by environmental law, sustainable business practices, and clean energy policies, and their impact on business and management practices.

BA 533. BUSINESS LAW FOR MANAGERS. (3 Credits)
Develops knowledge and skills about business law used by managers in global organizations. Topics covered include establishing lawful and ethical business practices; preventing and responding to compliance failures, infringement and other legal threats; effective use of contracts; and resolving disputes through litigation and alternative dispute resolution.
Recommended: BA 230 and BA 233 and BA 513 and PHAR 707 and PHAR 708

BA 540. CORPORATE FINANCE. (3 Credits)
Emphasizes analytical tools to measure and manage firm value, through corporate strategies such as mergers and acquisitions, leveraged buyouts, international expansion, and new venture development.
Recommended: (BA 340 or FIN 340 or FIN 340H) with a minimum grade of C-

BA 543. FINANCIAL MARKETS AND INSTITUTIONS. (3 Credits)
Investigates the five major financial markets: common stock, bond, derivatives, mortgage, and currency. The course examines the agents in each of these markets, the rules of trading, and the rationale of the agents participating in the different markets.
Recommended: (BA 340 or FIN 340 or FIN 340H) with a minimum grade of C-

BA 550. ORGANIZATION LEADERSHIP AND MANAGEMENT. (3 Credits)
Organization-wide implementation issues driven by change. Provides a balanced view of the structural and human sides of organization design.
Recommended: BA 352 with a minimum grade of C-

BA 551. SUPPLY AND SOURCING MANAGEMENT. (3 Credits)
Focus on effectively using operations and supply chain management to make sourcing and supply decisions in international business contexts. Topics include purchasing/procurement procedures and policy, supply organization, specifications, sourcing strategy, supplier evaluation, competitive bidding, and e-procurement. Global contexts and environmentally and socially responsible supply management are emphasized.

BA 552. MANUFACTURING AND SERVICE OPERATIONS. (3 Credits)
Focus on the management of global service operations including designing and managing systems to coordinate global information and material flows within and between firms in a supply chain. Covers planning operations, evaluating system alternatives, designing and researching global supply networks, examining complex adaptive systems and evaluating value stream synchronization.
Prerequisites: BA 551 with B- or better and BA 555 [B-]
Equivalent to: BA 559
BA 554. LEAN ENTERPRISE MANAGEMENT AND CAPSTONE. (3 Credits)
Analyze business cases that address global value creation and production/delivery systems. Complete integrated business projects to identify critical operations and supply chain management issues, apply multidisciplinary knowledge, analyze and evaluate alternative solutions and write and present reports recommending firm strategies. International business and cross-cultural competencies are emphasized. 
Prerequisites: BA 559 with B- or better and BA 561 [B-]

BA 555. PRACTICAL BUSINESS ANALYSIS. (3 Credits)
Advanced survey of quantitative business methods useful for aiding management decisions. Topics include a review of basic statistics, mathematical programming, business simulation, statistical process control, advanced regression analysis and forecasting. 
Recommended: BA 275 with a minimum grade of C- or higher

BA 557. GLOBAL LOGISTICS MANAGEMENT: FUNDAMENTALS AND STRATEGY. (3 Credits)
Students will learn key concepts, basic strategies, and decision-making tools relevant to logistics management, and apply them to real-world logistics problems faced by companies in the context of managing their global supply chains. 
Prerequisites: BA 551 with B or better and BA 552 [B] and BA 561 [B]

BA 559. SERVICE OPERATIONS MANAGEMENT. (3 Credits)
Focus on the management of global service operations including designing and managing systems to coordinate global information and material flows within and between firms in a supply chain. Covers planning operations, evaluating system alternatives, designing and researching global supply networks, examining complex adaptive systems and evaluating value stream synchronization. 
Prerequisites: BA 551 with B- or better and BA 555 [B-] 
Equivalent to: BA 552

BA 560. VENTURE PLANNING. (3 Credits)
Entrepreneurial and innovation processes applied to new business start-ups, existing small businesses, and new ventures within larger organizations; emphasis on venture planning with project management. Lec/rec. 
Recommended: (BA 340 or BA 340H or FIN 340 or FIN 340H) and (BA 390 or BA 390H) with a minimum grade of C-

BA 561. SUPPLY CHAIN MANAGEMENT. (3 Credits)
Covers tools and concepts needed to manage the entire supply chain effectively. Topics include negotiation, purchasing, logistics operations, and applying e-business tools. Emphasis on creating integrated supply chains. 
Recommended: (BA 357 and BA 555) with a minimum grade of C-

BA 562. MANAGING PROJECTS. (3 Credits)
Covers tools and concepts used by managers to plan and initiate business projects. Computer applications, cases and a project. 
Recommended: (BA 352 and BA 357) with a minimum grade of C-

BA 563. FAMILY ENTERPRISE GOVERNANCE. (4 Credits)
Builds on the introductory family business management course to examine the required elements of a successful enterprise, a diversified and multigenerational organization comprised of multiple business lines. 
Recommended: BA 365

BA 567. SELECTED TOPICS IN MANAGEMENT. (0-4 Credits)
Examination of the impact of recent advances in management on contemporary business. Topic will vary from term to term. Lec/rec. 
This course is repeatable for 16 credits.
BA 575. DATA EXPLORATION AND VISUALIZATION. (3 Credits)
In this course we concentrate on the initial, exploratory phases of business analytic data analysis. We explore different types of data and the types of analysis they allow; aggregating and disaggregating data and issues of validity with both selecting and collecting data. We also start exploring one or more datasets relating to our Integrated Business Analytics Project (BA 577).
Prerequisites: BA 573 with C or better

BA 576. DATA AND TEXT MINING. (3 Credits)
Examine how data/text analysis technologies can be used to improve decision making. The class covers the fundamental principles and techniques of data mining, text analysis, and uses real-world examples and cases to place data-mining techniques in context. Students will have hands-on experience with data/text mining software.
Prerequisites: BA 574 with C or better and BA 575 [C]

BA 577. INTEGRATED BUSINESS ANALYTICS PROJECT. (3 Credits)
Students will integrate what they have learned to solve industry-sponsored problems. The goal of the class is to provide students with opportunities to design, implement, and evaluate analytic solutions for a real-world enterprise. Student teams will examine the data requirements, technical requirements, and organizational requirements necessary for the success of analytical solutions. The project will give students the experience of leading and managing an analytical team, much as a Chief Analytics Officer (CAO) would be expected to do.
Prerequisites: BA 555 with C or better and BA 574 [C] and BA 575 [C]

BA 578. SUPPLY CHAIN ANALYTICS. (3 Credits)
Explores modeling methods for design, analysis, execution and integration of supply chains. Introduces students to a variety of modeling and optimization techniques for the analysis of strategic, tactical and operational supply chain problems including demand forecasting, risk analysis, revenue management, distribution and facility location.
Prerequisites: BA 555 with B- or better

BA 590. MARKETING MANAGEMENT. (3 Credits)
Provides students with an understanding of how a market-orientation can help firms to profitably deliver value to their targeted customers. Through a combination of lectures, in-class exercises, and case discussions, students will learn how to analyze complex marketing challenges, and make strategic decisions based on established marketing management principles.
Recommended: BA 390 with a minimum grade of C-

BA 599. SPECIAL TOPICS IN BUSINESS ADMINISTRATION. (1-4 Credits)
This course is repeatable for 16 credits.

BA 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 32 credits.

BA 602. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 32 credits.

BA 603. THESIS/DISSERTATION. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

BA 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 32 credits.

BA 607. SEMINAR. (1-16 Credits)
This course is repeatable for 32 credits.

BA 611. TEACHING EFFECTIVENESS. (1-6 Credits)
Provides an overview of a broad range of effective teaching techniques and common issues associated with teaching at the college level (e.g., defining learning outcomes, common pitfalls, assessing of student learning, etc.).
This course is repeatable for 6 credits.

BA 612. FOUNDATIONS OF BUSINESS RESEARCH. (3 Credits)
Introduces first-year business doctoral students to concepts fundamental to conducting research in business as a social science. Specific topics may change from quarter to quarter, but sample topics include the academic environment in business, research paradigms, ethics in research, fundamentals of scientific research, constructs, validity, sampling, and analysis and interpretation.

BA 613. SEMINAR IN BUSINESS RESEARCH METHODS. (3 Credits)
Provides first-year business PhD students with an in-depth introduction to the most common research methodologies used by current business faculty across multiple functional disciplines. Specific research methods covered may change from quarter to quarter, but sample topics include use of basic econometric models for analysis of archival data, experimental methodologies, qualitative research techniques, and survey research.

BA 660. FOUNDATIONS OF ENTREPRENEURSHIP RESEARCH. (3 Credits)
Provides a broad overview of the foundations of entrepreneurship research, including theoretical underpinnings of the field as well as some of the common and/or promising approaches to the study of entrepreneurial phenomena.

BA 661. DOCTORAL SEMINAR IN ORGANIZATIONAL THEORY. (3 Credits)
Surveys research on classic and contemporary developments in basic organizational theory.

BA 662. CORPORATE ENTREPRENEURSHIP AND NEW VENTURES. (3 Credits)
Surveys research in the area of corporate entrepreneurship and venturing, focusing on relevant theoretical underpinnings and core concepts in the corporate entrepreneurship, entrepreneurship, and strategy literatures.

BA 663. STRATEGIC MANAGEMENT. (3 Credits)
Surveys research exploring the central question in strategy: Why do some firms outperform others? The course considers a wide variety of foundational and contemporary issues in the field, and while specific topics may change from quarter to quarter, sample topics include competitive and cooperative interactions, the resource-based view and firm capabilities, organizational learning and adaptation, and industry evolution.

BA 664. TECHNOLOGY AND INNOVATION MANAGEMENT. (3 Credits)
Surveys research on the management of innovation and technology in organizations, focusing on innovation as an outcome (product, service, technology, practice) and on the process of generation, adoption, and implementation of innovation in organizations.

BA 808. WORKSHOPS. (0-16 Credits)
Workshops aimed at practicing professionals in the discipline. Topics may vary.

Design and Human Environment

DHE 160. DESIGN PERSPECTIVES. (4 Credits)
Overview of how design reflects and shapes social, cultural, and temporal values and contexts across many different areas of design specialization. Areas to be explored include design processes, principles, and problem solving.
DHE 161. DESIGN EXPLORATIONS. (4 Credits)
Introduction to principles and theories of design through iterative development and making of project work. Topics include basic design terminology, design principles, and materiality. Lec/studio.
Prerequisites: DHE 160 with C- or better

DHE 170. INTRODUCTION TO THE TEXTILE AND APPAREL INDUSTRY. (4 Credits)
Overview of industry sectors involved in the planning, creation, production, merchandising, distribution, and consumption of textile, apparel, and related products. Overview of various career options within the industry.

DHE 180. INTRODUCTION TO SINGLE FAMILY HOUSING. (3 Credits)
Critical examination of single family housing. Considers space planning fundamentals. Introduces construction principles and methods. Develops a working knowledge of methods used to communicate architectural ideas.
Equivalent to: AIHM 180

DHE 181. INTRODUCTION TO INTERIOR DESIGN. (3 Credits)
Introduction to the interior design profession including space planning fundamentals, design process, color, sustainability, and human-centered design.

DHE 187. INTRODUCTION TO DESIGN COMMUNICATION. (0-3 Credits)
Fundamentals of design communication including drafting, lettering, illustrative sketching, perspective, and orthographic projections. Lec/studio.
Prerequisites: DHE 180 with C- or better

DHE 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 227. APPAREL DESIGN AND PRODUCTION 1. (4 Credits)
Terminology, construction techniques and processes used to produce apparel. Development of production patterns and specifications with analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/studio.
Equivalent to: AIHM 227

DHE 233. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Examination of fashion change in apparel from 1890 to the present. Recognition of style variations. Influence of socio-cultural factors. Lec/studio.
Prerequisites: DHE 170 with C- or better
Equivalent to: DHE 463

DHE 242. INTRODUCTION TO SOFTGOODS MERCHANDISING. (4 Credits)
Overview of merchandising functions within the apparel industry, as well as how these functions interact with industry sectors involved in the planning, creation, production, distribution, and sale of apparel and related products. Wholesale and retail assortment planning. Basic merchandising mathematics. Excel skill development. Lec/lab.
Equivalent to: DHE 282

DHE 262. HUMAN-CENTERED RESEARCH IN DESIGN AND MERCHANDISING. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Lec/lab.
Prerequisites: DHE 161 with C- or better

DHE 263. HUMAN-CENTERED DESIGN THEORIES AND STRATEGIES. (4 Credits)
Overview of perception, semantics, and information design theories and strategies within a human-centered context.

DHE 267. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Introduction to soft goods retailing with a focus on the role of the retail buyer. Fundamental retailing and merchandising concepts, sustainable and socially responsible decision-making related to retail buying, basic merchandising mathematics, and Excel skill development. Lec/lab.
Equivalent to: DHE 242, DHE 276

DHE 271. INTRODUCTION TO RETAIL BUYING. (3 Credits)
Introduction to soft goods retailing with a focus on the role of the retail buyer. Fundamental retailing and merchandising concepts, sustainable and socially responsible decision-making related to retail buying, basic merchandising mathematics, and Excel skill development. Lec/lab.
Prerequisites: DHE 170 with C- or better
Equivalent to: DHE 242, DHE 271, DSGN 276

DHE 276. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Overview of merchandising functions within the textile and apparel industry. Fundamental merchandising concepts. Merchandising mathematics related to pricing and re-pricing, the profit and loss statement, and performance evaluation. Excel skill development. Lec/lab.
Prerequisites: DHE 242 with D- or better
Equivalent to: AIHM 281, DSGN 281

DHE 280. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 3 credits.

DHE 282. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 3 credits.

DHE 283. BUILDING CONSTRUCTION AND MATERIALS. (3 Credits)
Introduction to the manufacture, characteristics and use of construction materials used in contract and residential construction, including environmentally friendly materials.
Equivalent to: DSGN 383

DHE 287. STUDIO I: DESIGN COMMUNICATION. (4 Credits)
Design communication through electronic media: 2D and 3D visualizations and presentations of interior space. Lec/studio.
Prerequisites: DHE 187 with C- or better
Equivalent to: DSGN 287

DHE 288. ENVIRONMENTAL BUILDING SYSTEMS. (3 Credits)
Lighting, heating, ventilating, air conditioning, and acoustical systems in residential and commercial buildings. Includes sustainable building principles.
Prerequisites: DHE 283 with C- or better and DHE 287 [C-]
Equivalent to: DHE 282

DHE 289. STUDIO II: RESIDENTIAL SPACE PLANNING. (4 Credits)
Utilization of space planning principles in the design of residences. Includes rendering, perspective drawing, graphic communication techniques, and model building. Lec/studio.
Prerequisites: DHE 287 with C- or better
Equivalent to: DHE 385

DHE 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 300. FIELD EXPERIENCE ORIENTATION AND DEVELOPMENT. (1-2 Credits)
This course is repeatable for 3 credits.
DHE 310. FIELD EXPERIENCE. (1-12 Credits)
Integration and application of academic preparation in an on-the-job work situation with supervision by personnel at the participating site and university faculty. Application must be made prior to participation. Section 1: Merchandising Management (1-12) Section 2: Interior Design (1-12) Section 3: Apparel Design (1-12) Section 4: Graphic Design (1-12) Graded P/N.
Prerequisites: DHE 300 with D- or better
Equivalent to: DHE 410, DSGN 410
This course is repeatable for 16 credits.

DHE 321. ILLUSTRATION, PORTFOLIO, AND DESIGN DEVELOPMENT. (3 Credits)
Techniques in technical drawing, fashion illustration, and portfolio development; use of computer-aided design applications in the design of apparel.
Prerequisites: DHE 245 with C- or better and DHE 277 [C-]
Equivalent to: AIHM 321

DHE 326. SEWN PRODUCT DEVELOPMENT. (5 Credits)
Materials, assembly process, quality factors, and costs in the development of sewn textile products; consideration of consumer product expectations and intended end-use. Lec/lab.
Prerequisites: DHE 250 (may be taken concurrently) with C- or better or DHE 255 (may be taken concurrently) with C- or better
Equivalent to: AIHM 326, DHE 476

DHE 327. APPAREL DESIGN AND PRODUCTION 2. (4 Credits)
Terminology, construction techniques and processes used to produce apparel. Development of production patterns and specifications. Development of original apparel designs.
Prerequisites: DHE 227 with C- or better
Equivalent to: AIHM 327, DSGN 327

DHE 328. COMPUTER-AIDED PATTERN DEVELOPMENT. (3 Credits)
Computer-aided flat pattern, grading and marker techniques using pattern development software.
Equivalent to: DSGN 328
Recommended: DHE 327 or previous flat pattern experience.

DHE 330. FASHION FORECASTING AND MARKET ANALYSIS. (4 Credits)
Forecasting and market analysis processes applied to fashion goods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 233 with C- or better and WR 121 [C-] and WR 222 [C-]
Equivalent to: DHE 370, DSGN 330

DHE 334. FASHION HISTORY AND SOCIETY. (4 Credits)
The influence of society, culture, geography, fashion, and technology on the design and consumption of dress, Late Middle Ages to 1899.
Prerequisites: DHE 330 with C- or better
Equivalent to: DHE 461

DHE 355. TEXTILE PERFORMANCE AND EVALUATION. (4 Credits)
Analysis and evaluation of textile materials and final products in relation to end use. Performance properties and serviceability testing, product specifications and industrial standards. Lec/lab.
Prerequisites: DHE 255 with C- or better
Equivalent to: DHE 453, DSGN 355

DHE 360. COLLABORATIVE STUDIO. (4 Credits)
Examines a variety of collaborative methodologies and situations. Students will work across disciplines to solve complex collaborative projects. The projects will be both client based and hypothetical. Lec/ studio.
Prerequisites: DHE 262 with C- or better and DHE 263 [C-]

DHE 366. CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT. (4 Credits)
Sociocultural study of the function and design of clothing, housing, interiors, and textiles. Cultural diversity; impact of cross-cultural contact; ethnicity.
Equivalent to: AIHM 366, DHE 437

DHE 370. TEXTILE AND APPAREL MARKET ANALYSIS. (4 Credits)
Organization, operation, and merchandising activities of the domestic textile and apparel industries. Analysis of the marketing process and the product/service mix of textile and apparel manufacturers. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 277 (may be taken concurrently) with C- or better
Equivalent to: AIHM 370, DHE 330, DSGN 330
Recommended: BA 390

DHE 376. RETAIL MERCHANDISE PLANNING AND PRESENTATION. (4 Credits)
Organization, operation, and competitive strategies of soft goods retailers. Planning, procurement, and promotion of merchandise assortments and inventory management.
Prerequisites: DHE 276 with C- or better and BA 215 [C-]
Equivalent to: DSGN 472

DHE 387. STUDIO III: ADVANCED DESIGN COMMUNICATION. (4 Credits)
Development of illustrative sketching, perspective drawing, concept model construction, and presentation materials.
Prerequisites: DHE 289 with C- or better
Equivalent to: DSGN 387

DHE 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AIHM 399
This course is repeatable for 16 credits.

DHE 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 401
This course is repeatable for 16 credits.

DHE 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 402
This course is repeatable for 16 credits.

DHE 403. THESIS. (1-16 Credits)
Equivalent to: AIHM 403, DSGN 403
This course is repeatable for 16 credits.

DHE 406. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 406, DSGN 406
This course is repeatable for 16 credits.

DHE 427. DRAPING. (4 Credits)
Garment design based on manipulation of fabric on a body form; emphasis on the interrelationships between fabric, garment design, and the human form.
Prerequisites: DHE 321 with C- or better and DHE 327 [C-]
Equivalent to: AIHM 427, DSGN 427
DHE 428. APPAREL PRODUCTION PROCESSES. (4 Credits)
Production pattern-making, pattern grading, marker making, garment specifications, and cost analysis. Apparel assembly processes; analysis of equipment capabilities and production processes.
Prerequisites: DHE 327 with C- or better
Equivalent to: AIHM 428, DSGN 428

DHE 429. ADVANCED APPAREL DESIGN. (4 Credits)
Design processes and research methods used to develop apparel designs. Students will identify design problems and implement appropriate methods to develop apparel products.
Prerequisites: DHE 321 (may be taken concurrently) with C- or better and DHE 327 (may be taken concurrently) [C-] and DHE 427 (may be taken concurrently) [C-] and DHE 428 (may be taken concurrently) [C-]
Equivalent to: DSGN 429

DHE 437. CONSUMER BEHAVIOR AND CULTURE. (4 Credits)
Global and cultural consumer behavior, globalization and cross-cultural marketing related to soft goods merchandising and retailing.
Prerequisites: DHE 334 with C- or better
Equivalent to: DHE 366

DHE 443. STUDIO VI: COMMERCIAL DESIGN. (4 Credits)
Commercial design, space planning and specifications for facilities such as retail, hospitality, healthcare, public institutions and offices.
Prerequisites: DHE 389 with C- or better
Equivalent to: AIHM 443

DHE 445. STUDIO VII: ADVANCED COMMERCIAL DESIGN. (4 Credits)
Interior design project development with emphasis on design of hospitality environments. Application of knowledge of space planning, building codes, and specifications to projects. Studio work includes concept sketches, schematic drawings, contract documents, sample boards, and models.
Prerequisites: DHE 443 with C- or better

DHE 453. PRODUCT QUALITY ASSURANCE. (4 Credits)
Analysis and evaluation of textile materials and final products in relation to end use. Performance properties and serviceability testing, product specifications and industrial standards. Lec/lab.
Prerequisites: DHE 255 with C- or better
Equivalent to: AIHM 453, DHE 355
Recommended: DHE 326

DHE 461. HISTORY OF THE NEAR ENVIRONMENT I. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the ancient world to the Renaissance. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 461, DHE 334

DHE 462. HISTORY OF THE NEAR ENVIRONMENT II. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the Renaissance to 1899. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: AIHM 462, DHE 334

DHE 463. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men's and women's apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: AIHM 463, DHE 233
Recommended: DHE 461 or DHE 462

DHE 464. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of housing and interior design from the mid-19th century until the present.
Prerequisites: DHE 461 with C- or better or DHE 462 with C- or better
Equivalent to: AIHM 464, DSGN 464

DHE 470. RETAIL MERCHANDISING. (4 Credits)
Organization, operation, and competitive strategies of soft goods retailers. Planning, procurement, pricing, and promotion of merchandise assortments and inventory management.
Prerequisites: DHE 370 with C- or better
Equivalent to: AIHM 470

DHE 472. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles. Lec/rec.
Prerequisites: DHE 271 with C- or better and DHE 470 [C-] and (BA 215 [C-] or BA 215H [C-])
Equivalent to: DSGN 472

DHE 475. *GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR. (4 Credits)
Trade theory and the effects of trade policy, cultural values, and economics on the global production, distribution, and consumption of textiles, apparel, and footwear. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: AIHM 475, DSGN 475

DHE 476. LINE PLANNING AND PRODUCT DEVELOPMENT. (4 Credits)
Overview of the merchandising function within branded apparel companies and private label retailers.
Prerequisites: DHE 376 with C- or better
Equivalent to: DHE 326

DHE 481. ^PROFESSIONAL PRACTICE IN HOUSING AND INTERIOR DESIGN. (3 Credits)
Ethical, business, and legal aspects of the design profession. Development of written documents, schedules, specifications, and other materials typical of the profession. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 389 with C- or better
Equivalent to: AIHM 481

DHE 488. STUDIO VI: HEALTHCARE DESIGN. (4 Credits)
Interior design project development with emphasis on healthcare design, contract documents, and building codes.
Prerequisites: DHE 394 with C- or better
Equivalent to: DSGN 488

DHE 490. STUDY TOUR. (1-6 Credits)
Planned study tour with specific professional focus.
Equivalent to: AIHM 490
This course is repeatable for 16 credits.

DHE 499. SPECIAL TOPICS IN DESIGN AND HUMAN ENVIRONMENT. (1-16 Credits)
Equivalent to: AIHM 499
This course is repeatable for 16 credits.

DHE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 501
This course is repeatable for 16 credits.

DHE 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 502
This course is repeatable for 16 credits.
DHE 503. THESIS. (1-16 Credits)
Equivalent to: AIHM 503
This course is repeatable for 999 credits.

DHE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AIHM 505
This course is repeatable for 16 credits.

DHE 506. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 506
This course is repeatable for 16 credits.

DHE 507. SEMINAR. (1-16 Credits)
Equivalent to: AIHM 507
This course is repeatable for 16 credits.

DHE 508. WORKSHOP. (1-16 Credits)
Equivalent to: AIHM 508
This course is repeatable for 16 credits.

DHE 509. PRACTICUM. (1-16 Credits)
Equivalent to: AIHM 509
This course is repeatable for 16 credits.

DHE 510. INTERNSHIP. (1-16 Credits)
Equivalent to: AIHM 510
This course is repeatable for 16 credits.

DHE 528. APPAREL PRODUCTION PROCESSES. (4 Credits)
Production pattern-making, pattern grading, marker making, garment specifications, and cost analysis. Apparel assembly processes; analysis of equipment capabilities and production processes.
Equivalent to: AIHM 528
Recommended: DHE 327

DHE 529. ADVANCED APPAREL DESIGN. (4 Credits)
Design processes and research methods used to develop apparel designs. Students will identify design problems and implement appropriate methods to develop apparel products. Lec/studio.
Recommended: Completion or concurrent enrollment in DHE 327 and DHE 427 and DHE 428

DHE 561. HISTORY OF THE NEAR ENVIRONMENT I. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the ancient world to the Renaissance. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 561

DHE 562. HISTORY OF THE NEAR ENVIRONMENT II. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the Renaissance to 1899. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 562

DHE 563. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men’s and women’s apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: AIHM 563

DHE 564. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of housing and interior design from the mid-19th century until the present.
Equivalent to: AIHM 564

DHE 566. RESEARCH IN THE CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT. (3 Credits)
Examines the research methods used to study the cultural aspects of the near environment. Case studies concerning cultural variation in the design and use of fabric, clothing and adornment, housing.
Equivalent to: AIHM 566

DHE 572. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles.
Prerequisites: DHE 570 (may be taken concurrently) with C or better
Equivalent to: AIHM 572
Recommended: BA 215

DHE 582. AESTHETIC AND PERCEPTUAL THEORIES OF THE NEAR ENVIRONMENT. (2 Credits)
Aesthetic aspects from the philosophical and theoretical bases formulated in art, art history, and psychology as applied to the near environment.
Equivalent to: AIHM 582

DHE 585. HUMAN BEHAVIOR AND THE NEAR ENVIRONMENT. (3 Credits)
Application of concepts and theories from cultural anthropology, sociology, psychology, and social psychology to the study of clothing and interiors. The significance of the near environment in the dynamics of social interaction.
Equivalent to: AIHM 585

DHE 594. RESEARCH METHODS IN DESIGN AND HUMAN ENVIRONMENT. (3 Credits)
Introduction to theory and research design in Design and Human Environment. Includes sampling, measurement, data collection (both qualitative and quantitative) and data analysis.

DHE 599. SPECIAL TOPICS IN DESIGN AND HUMAN ENVIRONMENT. (1-16 Credits)
Equivalent to: AIHM 599
This course is repeatable for 16 credits.

DHE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 601
This course is repeatable for 16 credits.

DHE 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 602
This course is repeatable for 16 credits.

DHE 603. THESIS. (1-16 Credits)
Equivalent to: AIHM 603
This course is repeatable for 999 credits.

DHE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AIHM 605
This course is repeatable for 16 credits.

DHE 606. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 606
This course is repeatable for 16 credits.

DHE 607. SEMINAR. (1-16 Credits)
Equivalent to: AIHM 607
This course is repeatable for 16 credits.

DHE 608. WORKSHOP. (1-16 Credits)
Equivalent to: AIHM 608
This course is repeatable for 16 credits.
Design

DSGN 121. COMPUTER AIDED DESIGN. (3 Credits)
Introduction to the Adobe Creative Suite: Illustrator and Photoshop.
Instruction in drawing, image editing, flat illustrations and textile design.
Lec/studio.
Equivalent to: DSGN 221

DSGN 199. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 12 credits.

DSGN 226. SPECIFICATION BUYING. (4 Credits)
Introduction to terminology, assembly process, quality factors, and costs in the development of sewn product specifications. Lec/lab.

DSGN 244. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Equivalent to: DSGN 244H

DSGN 244H. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 244

DSGN 253. PROFESSIONAL DEVELOPMENT. (3 Credits)
This course is designed to give you an early start on the process of career planning and development. The process involves thoughtful self-assessment, career exploration, planning and follow-through with preliminary employment strategies. The philosophy of this course is that the career management process is ongoing, systematic, and aimed towards a fulfilling work life, which is part of your overall plan for personal development.
Prerequisites: BA 101 with C- or better or (BA 162 with C- or better or BA 162H with C- or better)
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385

DSGN 255. TEXTILES. (4 Credits)
Equivalent to: DHE 255

DSGN 276. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Provides the introductory knowledge necessary to prepare students for working in the retail industry. Introduces students to the retail industry including basic terminology, industry history, and to merchandising management decisions. Prepares students for more advanced knowledge acquired in the Merchandising Management concentration.
Equivalent to: DHE 276

DSGN 281. DRAWING AND SKETCHING. (4 Credits)
Designed for both beginning drawers and those wanting to improve their skills. Focuses exclusively on hand drawing skills with an emphasis on technical drawing skills, observational and perspective drawing, as well as imagination and creativity. Students develop a working knowledge of visual methods for communicating design concepts. Class format includes a combination of quick drawing activities, demonstrations, lectures, critiques, and work time on drawing assignments. Throughout the term students are introduced to the drawings of several prominent designers and artists.
Equivalent to: DHE 281

DSGN 282. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 282

DSGN 283. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 283

DSGN 284. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 284

DSGN 287. STUDIO I: DESIGN COMMUNICATION. (4 Credits)
Focuses on design communication through electronic media. Students use AutoCAD, SketchUp, and the Adobe Creative Cloud to create 2D and 3D visualizations and presentations of interiors. Lec/studio.
Equivalent to: DHE 287
DSGN 311. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP I. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 311

DSGN 312. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 312

DSGN 313. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 313

DSGN 327. PERFORMANCE APPAREL INNOVATION I. (4 Credits)
Develop innovative performance apparel from technical specifications or prototypes. Analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/lab.
Prerequisites: DSGN 226 with C- or better
Equivalent to: DHE 327

DSGN 328. DIGITAL DESIGN FOR APPAREL. (3 Credits)
Computer-aided flat pattern, grading and marker techniques using industry relevant pattern development software.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 328

DSGN 329. SPORTSWEAR INDUSTRY COLLABORATION. (3 Credits)
Industry lead team project. Creation of briefs, sketch, pattern, design textile prints, construct prototypes based on identified consumer and company.
Prerequisites: DSGN 327 with C- or better

DSGN 330. *FASHION FORECASTING AND MARKET ANALYSIS. (4 Credits)
Forecasting and market analysis processes applied to fashion goods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WR 222 with C- or better or WR 323 with C- or better or WR 327 with C- or better
Equivalent to: DHE 330

DSGN 333. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men’s and women’s apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: DHE 233, DHE 463

DSGN 335. APPAREL AND FOOTWEAR VALUE CHAIN. (3 Credits)
Survey of the structure, functions, and current trends within the apparel and footwear value chain.

DSGN 341. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Equivalent to: DSGN 341H

DSGN 341H. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 341

DSGN 342. INTRODUCTION TO DESIGN MANAGEMENT. (4 Credits)
Introduces the foundations and concepts of design strategy and creative development.
Prerequisites: DSGN 341 with C- or better

DSGN 343. IDEA VISUALIZATION. (4 Credits)
Focuses on the design process through visual communication of ideation and sketching.
Prerequisites: DSGN 342 with C- or better

DSGN 352. TEXTILES FOR INTERIORS. (4 Credits)
Types, qualities, and maintenance of functional and decorative fabrics for homes and public buildings. Use of specifications, standards, and legislation.
Prerequisites: DSGN 255 with C- or better and DHE 255 with C- or better
Equivalent to: DHE 352

DSGN 355. SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS. (4 Credits)
Specification of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance. Lec/lab.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Equivalent to: DHE 355

DSGN 356. SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS. (3 Credits)
Specification of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance.
Prerequisites: DSGN 255 with C- or better
DSGN 357. EVALUATION OF PERFORMANCE MATERIALS LABORATORY. (1 Credit)
Evaluation of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Corequisites: DSGN 356
Recommended: Concurrent enrollment with DSGN 356

DSGN 372. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles.
Prerequisites: DSGN 276 with C or better
Equivalent to: DSGN 472

DSGN 377. RETAIL AND MERCHANDISING. (4 Credits)
Evaluation of performance within the merchandising functions of an organization. Development of merchandising plans based on quantitative and qualitative analysis, as well merchandising principles.
Prerequisites: DSGN 372 with C- or better or DSGN 472 with C- or better

DSGN 383. BUILDING CONSTRUCTION AND MATERIALS. (3 Credits)
An introduction to the manufacture, characteristics, sustainability, and use of construction materials in commercial and residential construction.
Equivalent to: DHE 283

DSGN 387. STUDIO III: ADVANCED DESIGN COMMUNICATION. (4 Credits)
Development of presentation and Building Information Modeling (BIM) skills through various computer programs including Adobe Illustrator, Adobe Photoshop, Sketchup, and Revit Architecture. In-class exercises and take-home assignments.
Prerequisites: DSGN 287 with C- or better
Equivalent to: DHE 387

DSGN 388. STUDIO IV: HOSPITALITY DESIGN. (4 Credits)
Study and design of hospitality spaces in compliance with building codes and industry standards, with emphasis on sustainability, safety, and cultural context.
Prerequisites: DSGN 387 with C- or better
Equivalent to: DHE 388

DSGN 394. STUDIO V: LIGHTING DESIGN. (4 Credits)
Lighting design and documentation for residential and small commercial projects. The commercial projects include space planning and lighting design for workspace and retail environments. Lec/Studio.
Prerequisites: DSGN 388 with C- or better or DHE 388 with C- or better
Equivalent to: DHE 394

DSGN 403. THESIS. (1-16 Credits)
Equivalent to: DHE 403
This course is repeatable for 16 credits.

DSGN 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: DHE 405
This course is repeatable for 16 credits.

DSGN 406. PROJECTS. (1-16 Credits)
Equivalent to: DHE 406
This course is repeatable for 16 credits.

DSGN 407. SEMINAR. (1-16 Credits)
Equivalent to: DHE 407
This course is repeatable for 16 credits.

DSGN 408. WORKSHOP. (1-16 Credits)
Equivalent to: DHE 408
This course is repeatable for 16 credits.

DSGN 409. PRACTICUM. (1-16 Credits)
Equivalent to: DHE 409
This course is repeatable for 16 credits.

DSGN 410. DESIGN INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N.
Equivalent to: DHE 410
This course is repeatable for 16 credits.

DSGN 411. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment.
DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 411

DSGN 412. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment.
DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 412

DSGN 413. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment.
DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 413

DSGN 422. DHE FASHION SHOW AND DESIGN EXHIBITION. (1-16 Credits)
Special topics in design and human environment.
Equivalent to: DHE 422
This course is repeatable for 16 credits.

DSGN 427. PERFORMANCE APPAREL INNOVATION II. (4 Credits)
Develop innovative performance apparel from technical specifications or prototypes. Analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/lab.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 427
DSGN 428. TECHNICAL SPORTSWEAR SIZING AND FIT. (4 Credits)
Development of sizing and grading systems used in sportswear and evaluation of garment fit by use of virtual and physical prototypes.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 428

DSGN 429. FUNCTIONAL DESIGN AND PRODUCT DEVELOPMENT. (4 Credits)
Design processes and research methods used to create functional designs. Students will identify design problems and develop design brief and functional product line for identified target company. Lec/lab.
Prerequisites: DSGN 428 with C- or better
Equivalent to: DHE 429

DSGN 440. DESIGN RESEARCH. (4 Credits)
Surveys design principles, methods and applications in business outcomes. Application of design research is investigated and analyzed in group projects.
Prerequisites: DSGN 343 with C- or better

DSGN 441. SERVICE DESIGN INNOVATION. (4 Credits)
Focuses on the impact that service design has on business enterprises. Creative ideation, critical analysis, and innovative thinking are integrated as foundations for service design outcomes.
Prerequisites: DSGN 440 with C- or better

DSGN 442. MATERIALITY AND MAKING FIELD PROJECT. (4 Credits)
Focuses on material properties and specifications. Students work in the makerspace to design product outcomes.
Prerequisites: DHE 440 with C- or better or DSGN 440 with C- or better
Equivalent to: DHE 442

DSGN 464. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of interior design from the mid-19th century to the present.
Prerequisites: ART 204 with C- or better or ART 205 with C- or better or ART 206 with C- or better
Equivalent to: DHE 464

DSGN 471. RETAIL PRESENTATION STRATEGIES. (4 Credits)
Provides an overview of, and examines competitive presentation strategies within, retail environments and channels (e.g., in-store, catalog, online, mobile) by integrating the principles and elements of design with sensory marketing.
Prerequisites: DSGN 377 with C- or better and (BA 390 [C-] or BA 390H [C-] or BA 223 [C-] or BA 223H [C-] or MRKT 390 [C-])

DSGN 473. RETAIL STRATEGIES PRACTICUM. (4 Credits)
Explores the role that retail strategies play within a value delivery network. Looks at how retailing helps deliver value created in manufacturing and in services. Examines how these organizations develop strategies to attract consumers and also how consumers develop strategies to acquire goods and services from retailers. Provides a foundation for students who plan to work in retailing or related disciplines.
Prerequisites: DSGN 377 with C- or better

DSGN 475. *GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR. (4 Credits)
Trade theory and the effects of trade policy, cultural values, and economics on the global production, distribution, and consumption of textiles, apparel, and footwear. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: DHE 475

DSGN 488. STUDIO VI: HEALTHCARE DESIGN. (4 Credits)
Interior design project development with emphasis on healthcare design, contract documents, and building codes.
Prerequisites: DSGN 394 with C- or better or DHE 394 with C- or better
Equivalent to: DHE 488

DSGN 495. STUDIO VII: SENIOR THESIS II. (4 Credits)
Individual design project development of programming document and construction drawings.
Prerequisites: DSGN 488 with C- or better
Equivalent to: DHE 495

Finance

FIN 340. FINANCE. (4 Credits)
Role and functions of a financial manager in the modern business environment in which a manager operates; formulation of financial objectives and policies; financial analysis, forecasting, planning, and control; asset management; capital budgeting; acquisition of funds through borrowing, stock issue, and by internal means; dividend policy; and international aspects of finance.
Prerequisites: ((BA 213 with C- or better or BA 215 with C- or better or BA 215H with C- or better) and (ECON 201 [C-] or ECON 201H [C-]))
Equivalent to: BA 340, BA 340H, FIN 340

FIN 340H. FINANCE. (4 Credits)
Role and functions of a financial manager in the modern business environment in which a manager operates; formulation of financial objectives and policies; financial analysis, forecasting, planning, and control; asset management; capital budgeting; acquisition of funds through borrowing, stock issue, and by internal means; dividend policy; and international aspects of finance.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BA 213 with C- or better or BA 215 with C- or better or BA 215H with C- or better) and (ECON 201 [C-] or ECON 201H [C-]))
Equivalent to: BA 340, BA 340H, FIN 340

FIN 341. INVESTMENTS. (4 Credits)
Risk and reward characteristics of investments; sources of investment information; domestic and international security markets; investment characteristics of common stocks, debt securities, convertible securities, option contracts, and investment companies; real property investment; economic market analysis; technical market analysis; tax aspects of investments; and investment management.
Prerequisites: BA 240 with C or better or BA 240H with C or better or BA 360 with C or better or BA 360H with C or better or FIN 340 with C or better or FIN 340H with C or better
Equivalent to: BA 341

FIN 342. ADVANCED FINANCIAL MANAGEMENT. (4 Credits)
Capital market theory and the valuation of risky assets, capital budgeting, valuing the firm's securities, capital structure theory, long-term financing alternatives, cost of capital, dividend policy, working capital management, financial analysis and planning, mergers, and takeovers.
Prerequisites: FIN 340 with C or better or FIN 340H with C or better or BA 240 with C or better or BA 240H with C or better or BA 360 with C or better or BA 360H with C or better
Equivalent to: BA 342

FIN 434. CFA PREPARATION. (2-4 Credits)
Provides students with structure and guidance in their preparation for the Chartered Financial Analyst (CFA) Level exam. Students systematically prepare for and are tested on the 18 sections of the exam.
Equivalent to: BA 434
This course is repeatable for 4 credits.
FIN 437. APPLIED PORTFOLIO MANAGEMENT. (2 Credits)
Hands-on experience of managing two investment portfolios. Each member in the Oregon State Investment Group (OSIG) should act as a financial analyst to analyze a chosen company by performing the Discounted Cash Flow (DCF) or Residual Income Model (RIM), the relative valuation, and the SWOT analyses. The weekly seminar offers opportunities for students to present their analyses and offer comments and suggestions to other's presentations.
Equivalent to: BA 437

FIN 438. APPLIED PORTFOLIO MANAGEMENT II. (1 Credit)
Each student will act as a financial analyst to analyze a chosen company using models learned in FIN 437. Provides students with an opportunity to practice security valuation and get familiar with the tools. In addition, this course will focus on various measures of portfolio performance.
Prerequisites: FIN 437 with C- or better or BA 437 with C- or better
Equivalent to: BA 438

FIN 439. APPLIED PORTFOLIO MANAGEMENT III. (1 Credit)
Each student will act as a financial analyst to analyze a chosen company using models learned from FIN 437. Provides students additional opportunity to practice security valuation and strengthen their understanding of the tools. In addition, this course will introduce ways to develop an efficient portfolio.
Prerequisites: FIN 437 with C- or better or BA 437 with C- or better
Equivalent to: BA 439

FIN 440. FIXED INCOME SECURITIES. (4 Credits)
Provides students with intermediate knowledge of fixed income assets, interest rate and interest rate theory, the tools for estimating values, and managing portfolios of fixed income assets. The course can also serve as a partial coverage of material expected of applicants planning on seeking the Certified Financial Analyst designation.
Prerequisites: FIN 341 with C- or better

FIN 441. FINANCIAL INSTITUTIONS. (4 Credits)
Introduction of markets and institutions that form the economic system of trading financial and real assets both domestically and internationally. The introduction of concepts of financial theory, institutional detail, regulatory environments, and the history of financial markets. Topics include legal, ethical, technological, and global issues facing financial managers, markets, and institutions.
Prerequisites: BA 240 with C or better or BA 240H with C or better or BA 360 with C or better or BA 360H with C or better or FIN 340 with C or better or FIN 340H with C or better
Equivalent to: BA 441

FIN 442. FINANCIAL STATEMENT ANALYSIS. (4 Credits)
Student develop the understanding and skill to use financial statements for investment decisions, credit decisions, performance analysis, and forecasting. Three main topic areas: analysis overview, accounting analysis, and financial analysis.
Prerequisites: FIN 342 with C- or better
Equivalent to: BA 435

FIN 443. PORTFOLIO MANAGEMENT. (4 Credits)
An introduction to the construction, revision, and performance evaluation of financial asset portfolios.
Prerequisites: FIN 341 with C- or better or BA 341 with C- or better
Equivalent to: BA 443

FIN 444. FINANCIAL RISK MANAGEMENT. (4 Credits)
Investigation of financial hedging activities for corporations and financial institutions using futures, options, and other derivative securities. Identification of risk attributes, valid hedging rationales, and management of hedging programs.
Prerequisites: FIN 341 with C- or better
Equivalent to: BA 444

FIN 445. INTERNATIONAL FINANCIAL MANAGEMENT. (4 Credits)
International monetary environment; foreign exchange risk management; source and availability of funds to finance trade and multinational operations; taxation planning and control; international portfolio diversification; international banking; capital budgeting; political risk evaluation of performance.
Prerequisites: FIN 341 with C- or better and FIN 342 [C-] and (FIN 440 [C-] or FIN 442 [C-] or FIN 443 [C-] or FIN 444 [C-] or FIN 499 [C])
Equivalent to: BA 445

FIN 499. SELECTED TOPICS IN FINANCE. (1-4 Credits)
Examination of the impact of recent advances in finance on contemporary business. Topic will vary from term to term. This course is repeatable for 16 credits.

FIN 542. INVESTMENTS. (3 Credits)
Introduction to the tools and concepts of security analysis and investments; basic security types, including stocks, bonds, options and futures, respective markets and to how these securities are traded; fundamental valuation techniques and theory for stocks and bonds.
Recommended: BA 360

FIN 543. PORTFOLIO MANAGEMENT. (4 Credits)
An introduction to the construction, revision, and performance evaluation of financial asset portfolios.
Prerequisites: FIN 542 with C or better

FIN 544. FINANCIAL RISK MANAGEMENT. (4 Credits)
Investigation of financial hedging activities for corporations and financial institutions using futures, options, and other derivative securities. Identification of risk attributes, valid hedging rationales, and management of hedging programs.
Equivalent to: BA 544

FIN 545. INTERNATIONAL FINANCIAL MANAGEMENT. (3 Credits)
International monetary environment; foreign exchange risk management; source and availability of funds to finance trade and multinational operations; taxation planning and control; international portfolio diversification; international banking; capital budgeting; political risk evaluation of performance.
Prerequisites: BA 540 with B- or better
Recommended: FIN 542

FIN 546. ADVANCED CORPORATE FINANCE. (3 Credits)
The second course in the Corporate Finance sequence. Examines corporate payout policies and capital structure choices, choices in debt financing, financial planning and working capital management, and valuation of projects using a real-options approach.
Prerequisites: BA 540 with B- or better
FIN 549. MERGERS AND ACQUISITIONS. (3 Credits)
Provides an in-depth examination of the theory and practice of the market for corporate control, primarily focusing on mergers and acquisitions (M&A). The objective of the course is to provide an understanding of how to structure, value, and implement an M&A transaction. Students will be expected to apply the appropriate tools and skills to evaluate M&A transactions.
Prerequisites: FIN 546 with B- or better

FIN 550. FUNDAMENTALS OF FINANCIAL PLANNING. (4 Credits)
Professional conduct and regulation, general financial planning principles, and education planning.

FIN 551. INSURANCE PLANNING AND TAX PLANNING. (4 Credits)
Risk management and insurance planning; tax fundamentals and income tax planning.
Prerequisites: FIN 550 with B- or better

FIN 552. FINANCIAL PLANNING II. (3 Credits)
Retirement planning; qualified and non-qualified retirement plans; IRAs; legal, tax, financial and non-financial aspects of estate planning; trusts; wills; wealth transfers.
Prerequisites: FIN 551 with C or better

FIN 553. FINANCIAL PLANNING III. (6 Credits)
Synthesis and integration of financial planning fundamentals to develop a comprehensive financial plan; client communication.
Prerequisites: FIN 552 with C or better

FIN 599. SELECTED TOPICS IN FINANCE. (1-4 Credits)
This course is repeatable for 16 credits.

FIN 640. FOUNDATIONS OF FINANCIAL RESEARCH. (3 Credits)
Provides an in-depth introduction to the foundations of financial research with an emphasis on theoretical developments and empirical research methods. Specific topics may change from quarter to quarter, but sample topics include theory of the firm, capital structure theory, dividend policy, and event study methodology.

FIN 641. CORPORATE FINANCE SEMINAR. (3 Credits)
Survey classic and contemporary research in the area of corporate finance. Specific topics may change from quarter to quarter, but sample topics include capital structure, dividend policy, agency theory, adverse selection and signaling, and non-cooperative games with and without complete information.

FIN 642. CAPITAL MARKETS. (3 Credits)
Surveys research on capital markets. Specific topics may change from quarter to quarter, but sample topics include asset pricing models, efficient markets vs behavioral finance, market volatility, volume, new issues market, and emerging markets.

Hospitality Management

HM 101. INTRODUCTION TO HOSPITALITY. (4 Credits)
Introduction to the food-service, lodging, and tourism components of the hospitality industry, and the essential leadership and management skills necessary for success in the field. Background information, current issues, and future challenges in various segments of the industry are included.

HM 210. HOSPITALITY INTERNSHIP. (3 Credits)
Students are required to complete this internship so that OSU and the sponsoring company can offer a platform from where students can apply the management concepts learned in class and acquire the necessary hands-on experience in a hotel, restaurant/food service and/or tourism industry to eventually qualify for a supervisory of managerial level role.
Prerequisites: HM 101 with C- or better

HM 240. HOSPITALITY COST CONTROL. (4 Credits)
Introduces the basic techniques and control procedures used in the hospitality industry to maximize profit and minimize costs. Examines and discusses methods employed to protect and uphold the investors/owners strategic financial goals. Students will focus on all aspects of hospitality control objectives; from food and beverage costs, purchasing, labor costs, menu pricing, establishing room rates, cash flow, theft and loss prevention, to computer applications. The principles of effective budgeting, important hospitality financial ratios and the factors that determine hospitality profitability will also be reviewed.

HM 310. INTERNSHIP II. (3 Credits)
Hospitality Internship II builds on the knowledge students have gained from their course work internship (HM 210). Students are required to complete this internship in a hotel, restaurant/food service and/or related hospitality sector. In cooperation with OSU and the sponsoring company, students will apply the HM concepts learned in class to a real-world business environment.

HM 320. SERVICE AUTOMATION AND TECHNOLOGY. (4 Credits)
Students discover the basic concepts of hospitality technology and service automation. The hospitality industry continues to see significant changes in all facets of business due to changing customer expectations, new and cheaper technology, and a challenging labor market. The result of these forces has led the hospitality industry to increasingly turn to automation of basic job tasks to stay competitive. Examines new technologies shaping the hospitality industry and how industry leaders are taking advantage of these new technologies to improve efficiency and service.

HM 321. HOSPITALITY TECHNOLOGY LABORATORY. (4 Credits)
Technology is critical to attracting, servicing and retaining hospitality customers. The Hospitality Technology Lab course introduces the student to each facet of technology in the industry. The course provides an opportunity for hands-on practical experience with the latest technology. At the end of the course, the student will have a basic working knowledge of Food 3D printers, hotel property management systems, global distribution systems, booking engines, revenue management solutions and other automation tools like Botlr.

HM 325. ONLINE MARKETING AND REPUTATION MANAGEMENT. (4 Credits)
Students are introduced to Online Internet Marketing techniques in the hospitality industry. The course will focus on online marketing, advertising strategies and the importance of a strong internet presence in order to maximize revenue. The course will show how organizations can encourage & capitalize on customer generated content practices to effectively retain customers and generate recurring revenue streams.
HM 340. VACATION PROPERTY MANAGEMENT. (4 Credits)
The vacation property market is one of the largest segments of the hospitality industry and is forecast to grow further over the next ten years. This course looks at each facet of this market including property development, contracts, management, promotion and financing. The course also explores the additional challenges and opportunities associated with the shared economy such as managing owner relations, homeowner associations, renovations and public policy.

HM 399. SPECIAL TOPICS. (4 Credits)
This course is repeatable for 16 credits.

HM 410. HOSPITALITY INTERNSHIP III. (3 Credits)
Hospitality Internship III builds on the knowledge the students have gained from their course work and their previous internships (HM 210 & HM 310). Students are required to complete this internship in a hotel, restaurant/food service and/or related hospitality sector. In cooperation with OSU and the sponsoring company, students apply the HM concepts learned in class to a real-world environment.

Prerequisites: HM 310 with C- or better

HM 420. REVENUE MANAGEMENT AND PRICING. (4 Credits)
Revenue management is critical to the hospitality industry due to the perishable nature of a service-based product. The fundamental principles and concepts of revenue management covered are capacity management, duration control, demand and revenue forecasting, discounting, overbooking practices, displacement analysis, channel management, and pricing execution.

HM 425. ADVANCED RESTAURANT MANAGEMENT AND OWNERSHIP. (4 Credits)
Covers concept development, design and funding of a new restaurant, and best practices in operations and management of a full-service foodservice operation. Intended for students wishing to develop their knowledge of foodservice entrepreneurialism, creation, operations and management/ownership.

HM 430. SERVICE MANAGEMENT. (4 Credits)
With growing access to information and alternative products, customers can choose where to do business based on the level of service they receive. This course will study and analyze service delivery systems for the hospitality industry with particular emphasis on implementing a consumer driven quality service program. This course will review customer service philosophy and techniques. Quality issues, service design and delivery, customer interaction systems, complaint handling and service recovery are also addressed.

HM 460. HOSPITALITY INVESTMENT AND ASSET MANAGEMENT. (4 Credits)
Covers the principles of hospitality investment and asset management. Provides future hospitality owners/executives with the tools and knowledge to evaluate real estate investments in new hospitality ventures. Tools for financial analysis and assessment, debt and equity financing (public and private), and the use of industry benchmarks are discussed and practiced. Students explore the financial feasibility of a specific hospitality investment while considering financial risk, new income streams, competitor analysis and market forecasting, investment and asset management.

HM 470. *ADVANCED HOSPITALITY. (4 Credits)
Capstone course for the hospitality management degree. Provides students with an in-depth understanding of the importance of core competencies in the hospitality and tourism industry. A broader interpretation of the hospitality industry is gained and the student will discover new and innovative practices within the industry. Students will apply the knowledge gained in this course and the program as a whole to a capstone project with an industry partner. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

Management

MGMT 364. PROJECT MANAGEMENT. (4 Credits)
Covers the tools available to project managers, the human and organizational dimensions in different project environments, some computer applications, cases, and a project.

Prerequisites: BA 351 with C or better or BA 352 with C or better or BA 352H with C or better

Equivalent to: BA 364

MGMT 446. CROSS-CULTURAL MANAGEMENT. (4 Credits)
Provides a comprehensive understanding of cross-cultural management issues including leading culturally diverse workforces and managing diversity in the workplace. Students will not only learn theoretical foundations and best practices to address regarding global work practices, but also learn how to transfer and apply the course materials in this course to their own organization.

Prerequisites: BA 352 with C or better or BA 352H with C or better

MGMT 448. EMPLOYEE RECRUITMENT AND SELECTION. (4 Credits)
Provides an in-depth coverage of best practices pertaining to the process of attracting, selecting, and hiring new employees in modern organizations. Topics that will be emphasized include recruitment tactics, legal issues related to staffing, the criteria organizations use to make hiring decisions, and the strengths and weaknesses of various techniques used to evaluate prospective applicants throughout the selection process. The implications of what we discuss for the organization, the hiring manager, and the job-seeker are considered.

Prerequisites: BA 352 with C or better or BA 352H with C or better

MGMT 449. COMPENSATION MANAGEMENT. (4 Credits)
Students will understand and design methods of compensation aimed at motivating and rewarding employee contributions to the organization. Employee contributions may include behavior, skills and goods/services that employees produce as individuals, teams, business units, projects or organizations. Topics include pay structures, performance measurement and evaluation, and various non-salary incentives.

Prerequisites: BA 352 with C or better

MGMT 452. LEADERSHIP. (4 Credits)
In-depth study of leadership research, theory and skills. Emphasis on analysis of organizational leadership situations and application of leadership skills in the workplace.

Prerequisites: BA 351 with C or better or BA 352 with C or better or BA 352H with C or better

Equivalent to: BA 452

MGMT 453. HUMAN RESOURCES MANAGEMENT. (4 Credits)
Personnel administration for line supervisors and managers. Integrates systems approach to understanding government regulation of employment, resolution of workplace personnel problems, and performance-based personnel management.

Prerequisites: BA 351 with C or better or BA 352 with C or better or BA 352H with C or better

Equivalent to: BA 453
MGMT 455. INFLUENCE AND NEGOTIATION. (4 Credits)
Focuses on analysis, skill development and application of management research to real-life organizational influence, persuasion, negotiation and conflict management situations.
Prerequisites: BA 352 with C or better or BA 352H with C or better
Equivalent to: BA 455

MGMT 456. MANAGEMENT FIELD PRACTICUM. (4 Credits)
An innovative application of key management principles and tools to real-life projects is provided. Students will be responsible for developing, designing, executing, and evaluating projects.
Prerequisites: MGMT 364 with C- or better or BA 364 with C- or better
Equivalent to: BA 456

MGMT 457. SUPPLY CHAIN STRATEGY. (4 Credits)
Covers tools and concepts needed to manage the supply chain effectively. Topics include negotiation, purchasing, logistics operations, and applying e-business tools. Emphasis on creating integrated supply chains.
Prerequisites: BA 357 with C- or better or BA 357H with C- or better
Equivalent to: BA 457

MGMT 459. MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces students to contemporary issues managers face making ethical and socially-responsible decisions in an increasingly competitive, transparent, and global environment. Practical examples and cases, as well as contemporary behavioral ethics research and theory are incorporated throughout the course.
Prerequisites: BA 352 with C- or better or BA 352H with C- or better
Equivalent to: BA 345, BA 354H

MGMT 477. INTEGRATED HUMAN RESOURCE ANALYTICS PROJECT. (4 Credits)
Students will integrate what they have learned to solve industry-sponsored problems. The goal of the class is to provide students with opportunities to design, implement, and evaluate analytic solutions for a real-world enterprise. Student teams will examine the data requirements, technical requirements, and organizational requirements necessary for the success of analytical solutions. The specific goal of the class is to provide students real-world case studies that examine the role of analytics in an organization. Special emphasis will be given to the implementation and leadership of the analytical function in an enterprise.
Prerequisites: BA 474 with C- or better and BA 475 [C-]

MGMT 499. SELECTED TOPICS IN MANAGEMENT. (1-4 Credits)
Examination of the impact of recent advances in management on contemporary business. Topic will vary from term to term.
This course is repeatable for 16 credits.

MGMT 548. EMPLOYEE RECRUITMENT AND SELECTION. (4 Credits)
Provides an in-depth coverage of best practices pertaining to the process of attracting, selecting, and hiring new employees in modern organizations. Topics that will be emphasized include recruitment tactics, legal issues related to staffing, the criteria organizations use to make hiring decisions, and the strengths and weaknesses of various techniques used to evaluate prospective applicants throughout the selection process. The implications of what we discuss for the organization, the hiring manager, and the job-seeker are considered.

MGMT 549. COMPENSATION MANAGEMENT. (4 Credits)
Students will understand and design methods of compensation aimed at motivating and rewarding employee contributions to the organization. Employee contributions may include behavior, skills and goods/services that employees produce as individuals, teams, business units, projects or organizations. Topics include pay strategies and structures, performance measurement and evaluation, and various non-salary incentives.

MGMT 552. ORGANIZATIONAL BEHAVIOR. (3 Credits)
Provides evidence-based study of human behavior within organizations with the goal of applying theories of human behavior to effective organizational administration. Topics include understanding individual differences, employee motivation, job design, the evaluation and motivation of employees, group dynamics and team management, effective communications, conflict management, employee stress, and work-life balance.

MGMT 553. HUMAN RESOURCES MANAGEMENT. (4 Credits)
Personnel administration for line supervisors and managers. Integrates systems approach to understanding government regulation of employment, resolution of workplace personnel problems, and performance-based personnel management.
Equivalent to: BA 553
Recommended: (BA 351 or BA 352 or BA 352H) with a minimum grade of C

MGMT 555. INFLUENCE AND NEGOTIATION. (4 Credits)
Focuses on analysis, skill development and application of management research to real-life organizational influence, persuasion, negotiation and conflict management situations.
Prerequisites: BA 516 with C or better
Equivalent to: MGMT 574

MGMT 559. MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (3 Credits)
Introduces students to contemporary issues managers face making ethical and socially-responsible decisions in an increasingly competitive, transparent, and global environment. Practical examples and cases, as well as contemporary behavioral ethics research and theory are incorporated throughout the course.

MGMT 571. ETHICAL LEADERSHIP. (3 Credits)
Students will learn the theoretical paradigms of ethical conduct and decision making and consider the role of business in society.
Prerequisites: BA 550 with C or better

MGMT 572. STRATEGIC HUMAN RESOURCE MANAGEMENT. (3 Credits)
Students will learn the theories of human resource management, the legal requirements for human resource practices, and how to create an HR measurement system that aligns with an organization's strategy.
Prerequisites: BA 550 with C or better
Recommended: BA 516 or equivalent with a minimum grade of C-

MGMT 574. NEGOTIATIONS. (3 Credits)
Students will learn the theories of negotiation and the techniques to develop an effective negotiation style.
Equivalent to: MGMT 555
Recommended: BA 516 with a minimum grade of C-

MGMT 575. INTEGRATIVE CAPSTONE I. (3 Credits)
First course in a two-course sequence spanning the final two quarters of the OLMBA program. Students will conduct an extensive analysis of the student's organization, the industry and external environment, the organization's competitors, internal organization, and business level strategy.
Prerequisites: BA 562 with B or better
MGMT 576. INTEGRATIVE CAPSTONE II. (3 Credits)
Second course in a two-course sequence spanning the final two quarters of the OLMBA program. Students start from the final proposal in MGMT 575 and formulate an integrative project plan through the application of multidisciplinary knowledge.
Prerequisites: MGMT 575 with B or better

MGMT 650. ORGANIZATIONAL BEHAVIOR. (3 Credits)
Surveys research on individual differences, psychological states, and team processes related to work motivation, decision-making and performance.

Marketing

MRKT 323. ADVANCED APPLICATION OF MARKETING PRINCIPLES. (4 Credits)
Develop an understanding of how a market-orientation can help firms to profitably deliver value to targeted customers. Through a combination of case discussions, preparation of a client project, lectures and in-class activities, analyze complex marketing challenges; make strategic decisions for products, services, and brands, based on marketing principles; and persuasively communicate decisions.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better
Equivalent to: MRKT 390

MRKT 390. BUILDING AND MANAGING PRODUCTS, SERVICES, AND BRANDS. (4 Credits)
Covers concepts and principles used by marketing professionals. Designed explicitly for Marketing majors, it is an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better

MRKT 396. FUNDAMENTALS OF MARKETING RESEARCH. (4 Credits)
Introduction to the fundamentals of market research. Provides a basic understanding of marketing research and relevant decisions in the process.
Prerequisites: (BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better or ST 202 with C- or better) and (BA 223 [C] or BA 223H [C] or BA 390 [C] or BA 390H [C])
Equivalent to: BA 396

MRKT 477. INTEGRATED MARKETING ANALYTICS PROJECT. (4 Credits)
Students will integrate what they have learned to solve industry-sponsored problems. The goal of the class is to provide students with opportunities to design, implement, and evaluate analytic solutions for a real-world enterprise. Student teams will examine the data requirements, technical requirements, and organizational requirements necessary for the success of analytical solutions. The specific goal of the class is to provide students real-world case studies that examine the role of analytics in an organization. Special emphasis will be given to the implementation and leadership of the analytical function in an enterprise.
Prerequisites: BA 474 with C- or better and BA 475 [C-]

MRKT 484. DIGITAL MEDIA AND MARKETING INTEGRATION. (4 Credits)
Digital media is a necessary component of marketing in today's businesses and non-profit organizations. The digital media industry is changing rapidly and transforming the way businesses connect and communicate with their customers. The number of digital marketing platforms, their strengths, weaknesses, and diversity of delivery make digital marketing an exciting opportunity. This course examines the major digital channels and platforms, implementation considerations, and the associated risks and limitations.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better

MRKT 485. SEARCH ENGINE MARKETING. (4 Credits)
Online visibility is driven by the effectiveness of an organization's Search Engine Optimization (SEO) and Search Engine Marketing (SEM). Search Marketing teaches the fundamentals of SEO and SEM and how they can be integrated into an overall marketing strategy to maximize brand visibility and performance.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better

MRKT 486. CUSTOMER RELATIONSHIP MANAGEMENT. (4 Credits)
An integration of people, process and technology. Students will learn how individuals and companies can gain the return on investment that they expect through technology implementation, service and business process mapping, employee training, customer relationship, customer life time value, technology solutions that track customer data and employee performance.
Prerequisites: BA 396 with C- or better or MRKT 396 with C- or better
Equivalent to: BA 486

MRKT 488. PERSONAL SELLING. (4 Credits)
An introductory course that focuses on two areas: the principles and theory of personal selling, and on understanding and developing the interpersonal communication skills needed for successful personal selling.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 491

MRKT 489. PERSONAL SELLING SKILLS AND TECHNIQUES. (4 Credits)
Learn and develop the skills necessary for persuasive encounters in personal selling settings, such as making sales calls, preparing and delivering presentations, writing documents (sales proposals, cover letters, and resumes) and structuring logical, persuasive, prioritized arguments.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 489

MRKT 491. QUALITATIVE RESEARCH METHODS. (4 Credits)
Students will gain an overall understanding of qualitative research and methods such as focus groups, in-depth interviews, and observational research. Explores qualitative research methods through hands-on learning and experiences.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
MRKT 492. CONSUMER BEHAVIOR. (4 Credits)
Understanding the processes that lead to purchase, so as to improve decisions on segmentation and the appropriate marketing mix for each segment. How consumers and households make decisions, and why different individuals/groups make different decisions. Application of behavioral science concepts at individual, subcultural and cultural levels. Effects of consumerism and regulation also are considered.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 492

MRKT 493. INTEGRATED MARKETING COMMUNICATIONS. (4 Credits)
Analysis of the influence of marketing communications on the attitudes and behaviors of consumer and industrial buyers. Identification and examination of the major decisions made by marketing/advertising managers in implementing the promotional mix.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 493

MRKT 495. RETAIL MANAGEMENT. (4 Credits)
Management of retail business with emphasis on strategic planning, analysis, and control, focused on middle- and upper-middle management decisions.
Prerequisites: BA 390 with C- or better or BA 390H with C- or better or BA 223 with C- or better or BA 223H with C- or better
Equivalent to: BA 495

MRKT 496. MARKETING RESEARCH PRACTICUM. (4 Credits)
Provides the student with practical experience in the collection, analysis and interpretation of primary data.
Prerequisites: MRKT 396 with C or better or BA 396 with C or better
Equivalent to: BA 496

MRKT 497. GLOBAL MARKETING. (4 Credits)
Consideration of cultural, political, regulatory, economic and trade barriers in the design of marketing plans for product development, pricing, channels of distribution; and promotion alternatives in a global market.
Prerequisites: (BA 347 with C- or better or BA 347H with C- or better) and (BA 390 [C-] or BA 390H [C-] or BA 223 [C-] or BA 223H [C-])
Equivalent to: BA 497

MRKT 498. SERVICES MARKETING. (4 Credits)
Formulation of strategic and tactical marketing plans for organizations (both profit and not-for-profit) in the service sector of the economy. Projects or cases are used to provide a comprehensive experience.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 498

MRKT 499. MARKETING STRATEGY. (4 Credits)
Market and competitive analysis for developing overall strategies and tactics to achieve the marketing objectives of the business enterprise. Projects or cases are used to provide a comprehensive experience.
Prerequisites: MRKT 396 with C or better or BA 396 with C or better
Equivalent to: BA 499

MRKT 581. APPLIED QUANTITATIVE MARKETING ANALYSIS. (4 Credits)
Includes a comprehensive presentation of quantitative methods used in marketing management. It is designed to prepare students to use quantitative techniques in making marketing decisions. Topics include ANOVA, regression, discriminant and logit analysis, factor analysis, cluster analysis, and structural equation modeling.
Prerequisites: BA 596 with C or better or MRKT 596 with C or better

MRKT 582. APPLIED QUALITATIVE MARKETING ANALYSIS. (3 Credits)
Explores the uses and application of qualitative research methods to inform and improve marketing decision-making. Students will be introduced to such methods as focus group interviews, individual in-depth interviews, observational research methods, participant observation, and ethnographic immersion. Students will learn appropriate analytic strategies and reporting methodologies.
Prerequisites: BA 596 with C or better or MRKT 596 with C or better

MRKT 584. DIGITAL MEDIA AND MARKETING INTEGRATION. (4 Credits)
Digital media is a necessary component of marketing in today's businesses and non-profit organizations. The digital media industry is changing rapidly and transforming the way businesses connect and communicate with their customers. The number of digital marketing platforms, their strengths, weaknesses, and diversity of delivery make digital marketing an exciting opportunity. This course examines the major digital channels and platforms, implementation considerations, and the associated risks and limitations.
Prerequisites: BA 516 with B- or better

MRKT 585. SEARCH ENGINE MARKETING. (4 Credits)
Online visibility is driven by the effectiveness of an organization's Search Engine Optimization (SEO) and Search Engine Marketing (SEM). Search Marketing teaches the fundamentals of SEO and SEM and how they can be integrated into an overall marketing strategy to maximize brand visibility and performance.
Prerequisites: BA 516 with B- or better

MRKT 586. CUSTOMER RELATIONSHIP MANAGEMENT. (4 Credits)
An integration of people, process and technology. Students will learn how individuals and companies can gain the return on investment that they expect through technology implementation, service and business process mapping, employee training, customer relationship, customer life time value, technology solutions that track customer data and employee performance.
Prerequisites: BA 516 with B- or better
Recommended: MRKT 396 with a minimum grade of C-

MRKT 587. DESIGNING CUSTOMER EXPERIENCES. (3 Credits)
Allows students to explore the process of designing customer experiences in ways that allow firms to successfully deliver value in a complex, dynamic competitive environment. Building on knowledge developed through collaboration, generation of customer insights, and mapping exercises, students will work in teams to design a customer experience for an industry client. Lec/studio.
Prerequisites: BA 590 with B- or better and MRKT 592 [B-]

MRKT 588. PERSONAL SELLING. (4 Credits)
An introductory course that focuses on two areas: the principles and theory of personal selling, and on understanding and developing the interpersonal communication skills needed for successful personal selling.
MRKT 589. PERSONAL SELLING SKILLS DEVELOPMENT. (4 Credits)
Learn and develop the skills necessary for persuasive encounters in personal selling settings, such as making sales calls, preparing and delivering presentations, writing documents (sales proposals, cover letters, and resumes) and structuring logical, persuasive, prioritized arguments.
Recommended: BA 491 or MRKT 488 with a minimum grade of C-

MRKT 592. CONSUMER BEHAVIOR. (3 Credits)
Understanding the processes that lead to purchase, so as to improve decisions on segmentation and the appropriate marketing mix for each segment. How consumers and households make decisions, and why different individuals/groups make different decisions. Application of behavioral science concepts at individual, subcultural and cultural levels. Effects of consumerism and regulation also are considered.
Prerequisites: BA 516 with B- or better
Equivalent to: BA 592

MRKT 593. INTEGRATED MARKETING COMMUNICATIONS. (3 Credits)
Analysis of the influence of marketing communications on the attitudes and behaviors of consumer and industrial buyers. Identification and examination of the major decisions made by marketing/advertising managers in implementing the promotional mix.
Prerequisites: BA 516 with B- or better
Equivalent to: BA 593

MRKT 595. RETAIL MANAGEMENT. (4 Credits)
Management of retail business with emphasis on strategic planning, analysis, and control, focused on middle- and upper-management decisions.
Equivalent to: BA 595
Recommended: (BA 390 or BA 390H or BA 590) with a minimum grade of C-

MRKT 596. MARKETING RESEARCH DESIGN AND METHODS. (3 Credits)
Focuses on articulating research problems, creating appropriate research design to address information needs (i.e., understanding markets, competitors, and customers), ethics (to include IRB training), and the application of diverse data collection methods, including secondary, qualitative, and quantitative methods. Measurement, sampling, and data preparation will also be addressed.
Equivalent to: BA 596
Recommended: BA 390

MRKT 597. GLOBAL MARKETING. (4 Credits)
Consideration of cultural, political, regulatory, economic and trade barriers in the design of marketing plans for product development, pricing, channels of distribution; and promotion alternatives in a global market.
Equivalent to: BA 597
Recommended: BA 347 and (BA 390 or BA 390H or BA 590) with a minimum grade of C-

MRKT 599. SELECTED TOPICS IN MARKETING. (1-4 Credits)
Concepts and methods in advanced marketing management practice. Latest theoretical developments and quantitative methods in marketing, with particular relevance to managerial applications. Topics will vary from term to term.
Equivalent to: BA 599
This course is repeatable for 16 credits.

MRKT 690. MARKETING AND COMMERCIALIZATION. (3 Credits)
Surveys marketing research related to innovation. Specific topics may change from quarter to quarter, but sample topics include research on marketing strategy, consumer behavior, brand equity, brand management, and product management, each from the perspective of the consumer and the firm.

Accountancy Graduate Major (MAC)
The Master of Accountancy is a one-year master’s program for students with an undergraduate degree in accounting. It allows accounting students to receive an undergraduate degree and a master’s degree during their five years of university study required to become a CPA. As an integrated program, the MAC is designed to allow students the opportunity to plan early enough in their accounting education program to enable them to receive both an undergraduate degree and a graduate degree. The MAC is also designed to accommodate post-baccalaureate students wishing to prepare for accounting careers by completing a two-year plan of study.

Major Code: 6411

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<th>Course</th>
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<td>Fall</td>
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<tr>
<td>ACTG 516</td>
<td>ACCOUNTING RESEARCH AND ANALYSIS</td>
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<td>ACTG 522</td>
<td>STRATEGIC COST MANAGEMENT</td>
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<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
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<td>BA 569</td>
<td>ADVANCED STRATEGIC MANAGEMENT</td>
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<td>BA 590</td>
<td>MARKETING MANAGEMENT</td>
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<td>ACTG 517</td>
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<td>BA 531</td>
<td>BUSINESS LAW - TECHNOLOGY/NEW VENTURES</td>
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<td>BA 540</td>
<td>CORPORATE FINANCE</td>
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MAC Accounting Courses

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<td>ACTG 318</td>
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<td>ACTG 378</td>
<td>ACCOUNTING INFORMATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 427</td>
<td>ASSURANCE AND ATTESTATION SERVICES</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 516</td>
<td>ACCOUNTING RESEARCH AND ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>ACTG 518</td>
<td>ACCOUNTING THEORY AND PRACTICE I</td>
<td>3</td>
</tr>
<tr>
<td>Select three of the following:</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>ACTG 517</td>
<td>ADVANCED ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td>ACTG 520</td>
<td>IT AUDITING</td>
<td></td>
</tr>
<tr>
<td>ACTG 522</td>
<td>STRATEGIC COST MANAGEMENT</td>
<td></td>
</tr>
</tbody>
</table>
### One-Year Schedule of Courses for Students with an Undergraduate Accountancy Degree

Course schedule for students with an undergraduate degree equivalent to the OSU Accountancy degree.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTG 516</td>
<td>ACCOUNTING RESEARCH AND ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>ACTG 522</td>
<td>STRATEGIC COST MANAGEMENT ¹</td>
<td>4</td>
</tr>
<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>BA 569</td>
<td>ADVANCED STRATEGIC MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 590</td>
<td>MARKETING MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTG 517</td>
<td>ADVANCED ACCOUNTING ¹</td>
<td>4</td>
</tr>
<tr>
<td>BA 531</td>
<td>BUSINESS LAW - TECHNOLOGY/NEW VENTURES</td>
<td>3</td>
</tr>
<tr>
<td>BA 540</td>
<td>CORPORATE FINANCE</td>
<td>3</td>
</tr>
<tr>
<td>BA 561</td>
<td>SUPPLY CHAIN MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 562</td>
<td>MANAGING PROJECTS</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTG 518</td>
<td>ACCOUNTING THEORY AND PRACTICE I</td>
<td>3</td>
</tr>
<tr>
<td>ACTG 520</td>
<td>IT AUDITING ¹</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 525</td>
<td>ADVANCED TAXATION</td>
<td>4</td>
</tr>
<tr>
<td>BA 550</td>
<td>ORGANIZATION LEADERSHIP AND MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>14</strong></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>46</strong></td>
</tr>
</tbody>
</table>

¹ Students take 3 of these 4 electives depending upon courses taken for undergraduate credit.

### Two-Year Schedule of Courses for Students without an Undergraduate Accountancy Degree

Course schedule for students without an undergraduate accountancy degree equivalent to the OSU Accountancy degree. Students must have all admission prerequisites completed before they begin classes in the fall of their first year including BA 211 and BA 213.

The course total is 81 credits over two years. Elective credits are included to ensure a minimum of 12 credits per term for financial aid or visa concerns.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTG 317</td>
<td>EXTERNAL REPORTING I</td>
<td>4</td>
</tr>
<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>BA 590</td>
<td>MARKETING MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTG 318</td>
<td>EXTERNAL REPORTING II</td>
<td>4</td>
</tr>
</tbody>
</table>

### Summary of Programs in Accountancy

Both the one-year and two-year MAC programs require 53 total accounting related credits (32 undergraduate accounting credits and 21 graduate accounting credits) and 24 business related total credits in the program.

### Accountancy Undergraduate Major (BS, HBS)

The Accountancy degree at OSU prepares students for high-demand careers in accounting, business and consulting. Our program combines core accounting principles with technology, analytics, qualitative skills, quantitative skills, and critical thinking to help students develop the knowledge and abilities necessary to compete in a rapidly changing business environment. We want our students to be future leaders and key decision makers in their firms, and many recruiters seek our Accountancy majors for internships and full-time positions.

Accountancy students learn the language of business through their interactions with faculty who emphasize both the theoretical and applied aspects of accounting. The faculty in accounting are recognized for their teaching innovations and cutting-edge research. The Accountancy program is ranked in the top 10 universities worldwide for research in accounting systems, and our faculty bring their research and business experience into the classroom. The Accountancy program is also accredited by the AACSB.

Accountancy students must meet all university and college core requirements and progression standards. Students also complete a minimum of 60 credits in upper-division courses (300–400 level) and a minimum of 180 credits to graduate. The Oregon State Board of Accountancy requires a minimum of 225 credits in order to take the Uniform Certified Public Accounting Exam, and the Accountancy program...
recommends specific courses to complete these hours and prepare for the CPA profession. The Certified Management Accountant program requires 180 credits.

**Major Code: 641**

Accountancy students must complete a minimum of 40 credits of Accountancy courses—32 credits in required courses and 8 credits in electives.

Students must also earn a C or better (a C– does not qualify for prerequisite credit) in their ACTG classes for graduation and to meet prerequisite requirements. In the first instance of a student earning lower than a C in an ACTG class, the student must repeat the class. In the second instance of a student earning lower than a C in an ACTG class, the student is removed from the Accountancy major and should see an advisor to discuss options.

Accountancy major requirements are divided into two parts—lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division accountancy and business curricula. The lower-division business core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

### Accountancy Curriculum (40)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 317</td>
<td>EXTERNAL REPORTING I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 318</td>
<td>EXTERNAL REPORTING II</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 319</td>
<td>EXTERNAL REPORTING III</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 321</td>
<td>COST MANAGEMENT I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 378</td>
<td>ACCOUNTING INFORMATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 379</td>
<td>ACCOUNTING ANALYTICS</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 424</td>
<td>TAXATION I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 427</td>
<td>ASSURANCE AND ATTESTATION SERVICES</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>Select two of the following:</td>
<td>8</td>
</tr>
<tr>
<td>ACTG 417</td>
<td>ADVANCED ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td>ACTG 420</td>
<td>IT AUDITING</td>
<td></td>
</tr>
<tr>
<td>ACTG 422</td>
<td>STRATEGIC COST MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>ACTG 425</td>
<td>ADVANCED TAXATION</td>
<td></td>
</tr>
<tr>
<td>ACTG 428</td>
<td>ADVANCED AUDIT ANALYTICS</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours**: 40

### Additional Optional Electives:

Students who wish to complete 225 credits in order to sit for the CPA exam should complete additional accounting electives beyond the required elective course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 326</td>
<td>ACCOUNTING RESEARCH METHODS AND TOPICS</td>
<td>2</td>
</tr>
<tr>
<td>ACTG 414</td>
<td>FORENSIC ACCOUNTING</td>
<td>2</td>
</tr>
<tr>
<td>ACTG 415</td>
<td>GOVERNMENTAL AND NOT-FOR-PROFIT</td>
<td>2</td>
</tr>
<tr>
<td>ACTG 416</td>
<td>ACCOUNTING RESEARCH AND ANALYSIS</td>
<td>2</td>
</tr>
<tr>
<td>ACTG 418</td>
<td>ACCOUNTING CODES OF PROFESSIONAL CONDUCT AND ETHICAL BEHAVIOR</td>
<td>2</td>
</tr>
<tr>
<td>ACTG 419</td>
<td>MULTINATIONAL ACCOUNTING AND ANALYSIS</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Hours**: 12

The standard progression in the accounting major includes the following courses in the third year: ACTG 317 in the fall term, ACTG 318 in winter term, and ACTG 319 in the spring term. ACTG 424 and ACTG 427 are typically completed during a student’s fourth year.

### Business Administration Core Curriculum (78–81)

The business administration core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate course work and further develop decision-making skills through the analysis of business cases.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

### Written and Oral Communication

Business students also must take:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>WR 222</td>
<td>ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>or WR 323</td>
<td>ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>or WR 327</td>
<td>TECHNICAL WRITING</td>
<td></td>
</tr>
</tbody>
</table>

**University General Requirements**: 40

**Unrestricted Electives**: 1-4

1. 10 credits from pre-business major satisfy University General Education Requirements.

### Summary of Requirements

<table>
<thead>
<tr>
<th>Code Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Division</td>
<td>62-65</td>
</tr>
<tr>
<td>Business Core Classes (44-47)</td>
<td>18</td>
</tr>
<tr>
<td>Math, Economics, Writing and Communications (18)</td>
<td>1</td>
</tr>
<tr>
<td>Upper Division</td>
<td>74</td>
</tr>
<tr>
<td>Accountancy Courses (40)</td>
<td></td>
</tr>
<tr>
<td>Business Core Classes (34)</td>
<td></td>
</tr>
<tr>
<td>University General Education Requirements</td>
<td>40</td>
</tr>
<tr>
<td>Unrestricted Electives</td>
<td>1-4</td>
</tr>
<tr>
<td>Total credits required for graduation</td>
<td>180</td>
</tr>
</tbody>
</table>

### Business Administration Core Curriculum (78–81)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

### Written and Oral Communication

Business students also must take:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>WR 222</td>
<td>ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>or WR 323</td>
<td>ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>or WR 327</td>
<td>TECHNICAL WRITING</td>
<td></td>
</tr>
</tbody>
</table>

**University General Requirements**: 40

**Unrestricted Electives**: 1-4

1. 10 credits from pre-business major satisfy University General Education Requirements.

### Total Hours**: 40

1. MTH 241; ECON 201 and ECON 202; WR 222, WR 323 or WR 327, and COMM 111, COMM 114 or COMM 218 meet the university’s Baccalaureate Core requirements for mathematics, social processes and institutions, writing II, and speech, respectively. All students must meet the other Baccalaureate Core requirements and the other requirements for baccalaureate degrees. (See Requirements for Baccalaureate Degrees.)

* Baccalaureate Core Course (BCC)

* Writing Intensive Course (WIC)
## Accountancy Major

### Course | Title | Hours
--- | --- | ---
**First Year**

Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the business administration major from another college or university, will complete the following three-course sequence during their first year:

- **BA 160** B-ENGAGED
- **BA 161** INNOVATION NATION--AWARENESS TO ACTION
- **BA 162** INNOVATION NATION--IDEAS TO REALITY

All other students will complete the following course:

- **BA 101** BUSINESS NOW 6

All students should also complete:

- **COMM 111** *PUBLIC SPEAKING* 3
- or **COMM 114** or **COMM 218** or **INTERPERSONAL COMMUNICATION**

**MTH 241** *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE* 4

### Hours: 45

### Second Year

All students should complete the following courses:

- **BA 280** BUSINESS INSIGHTS (Transfer students only)
- **BA 281** PROFESSIONAL DEVELOPMENT 3
- **BA 282** PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I 1
- **BA 283** CREATIVITY, CULTURE, AND THE WORKPLACE 1
- **BA 284** PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III 1

*Students who transfer from another college or university into the accountancy major who have completed all lower-division business core course work should complete the following course:

- **BA 381** PERSONAL AND PROFESSIONAL DEVELOPMENT

All second-year students should also complete:

- **BA 211** FINANCIAL ACCOUNTING 4
- **BA 213** MANAGERIAL ACCOUNTING 4
- **BA 223** PRINCIPLES OF MARKETING 4
- or **BA 239** or **MARKETING**
- **BA 230** BUSINESS LAW I 4
- **BA 240** FINANCE 4
- or **BA 360** or **INTRODUCTION TO FINANCIAL MANAGEMENT**
- **BA 260** INTRODUCTION TO ENTREPRENEURSHIP 4
- **BA 270** BUSINESS PROCESS MANAGEMENT 4
- **BA 275** FOUNDATIONS OF STATISTICAL INFERENCE 4
- **ECON 201** *INTRODUCTION TO MICROECONOMICS* 4
- **ECON 202** *INTRODUCTION TO MACROECONOMICS* 4

### Hours: 45

### Third Year

- **ACTG 317** EXTERNAL REPORTING I 4
- **ACTG 318** EXTERNAL REPORTING II 4
- **ACTG 319** EXTERNAL REPORTING III 4
- **ACTG 321** COST MANAGEMENT I 4
- **ACTG 378** ACCOUNTING INFORMATION MANAGEMENT 4
- **BA 311** THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I 1
- **BA 312** THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II 1
- **BA 313** THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III 1
- **BA 347** INTERNATIONAL BUSINESS 4
- **BA 352** MANAGING INDIVIDUAL AND TEAM PERFORMANCE 4
- **BA 354** *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY* 4
- **BA 357** OPERATIONS MANAGEMENT 4
- **BA 375** APPLIED QUANTITATIVE METHODS 4

### Hours: 46

### Fourth Year

- **ACTG 379** ACCOUNTING ANALYTICS 4
- **ACTG 424** TAXATION I 4
- **ACTG 427** ASSURANCE AND ATTESTATION SERVICES 4

Two elective accountancy courses from below:

- **ACTG 417** ADVANCED ACCOUNTING
- **ACTG 420** IT AUDITING
- **ACTG 422** STRATEGIC COST MANAGEMENT
- **ACTG 425** ADVANCED TAXATION
- **ACTG 428** ADVANCED AUDIT ANALYTICS

- **BA 411** FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I 1
- **BA 412** THE DESIGN THINKING CHALLENGE 1
- **BA 413** FINANCIAL PLANNING II 1
- **BA 466** INTEGRATIVE STRATEGIC EXPERIENCE 4

Baccalaureate core, minor, option or unrestricted electives 16

### Hours: 43

### Total Hours: 180

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

### Major Code: 641

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>
| **First Year**

**Fall**

- **BA 160** B-ENGAGED 3
- **WR 222** *ENGLISH COMPOSITION* 3
- or **WR 322** or **WR 323** or *ENGLISH COMPOSITION* or **WR 327** or *TECHNICAL WRITING* 3

**BC Science** 4

**WR 121** *ENGLISH COMPOSITION (Alpha coded)* 3
- or **COMM 111** or **COMM 114** or **PUBLIC SPEAKING** or **COMM 218** or **ARGUMENT AND CRITICAL DISCOURSE** or **INTERPERSONAL COMMUNICATION**

Math through **MTH 241** 4

### Hours: 14

**Winter**

- **BA 161** INNOVATION NATION--AWARENESS TO ACTION 3
- **BC Science** 4
- **WR 121** *ENGLISH COMPOSITION (Alpha coded)* 3
- or **COMM 111** or **PUBLIC SPEAKING** or **COMM 114** or **ARGUMENT AND CRITICAL DISCOURSE** or **COMM 218** or **INTERPERSONAL COMMUNICATION**

Math through **MTH 241** 4

### Hours: 14

**Spring**

- **BA 162** INNOVATION NATION--IDEAS TO REALITY 3
- **BC Science** 4
- **WR 121** *ENGLISH COMPOSITION (Alpha coded)* 3
- Bacc Core (Fitness, Speech, CD, DPD Electives) 6

### Hours: 16

### Second Year

**Fall**

- **BA 211** FINANCIAL ACCOUNTING 4
- **BA 260** INTRODUCTION TO ENTREPRENEURSHIP 4
- **BA 275** FOUNDATIONS OF STATISTICAL INFERENCE 4
- **ECON 201** 4
- **ECON 202** 4

Math through **MTH 241** 4

### Hours: 16
Accounting Information Systems Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)

The Accounting Information Systems (AIS) option prepares students for entry-level positions and successful careers in the information management or information systems auditing fields. The program builds on the business, accounting, and computer skills classes required of all accounting students, and prepares students specifically to apply the information technologies to accounting, auditing, and other business tasks.

The program of study that includes the accounting major and these selected courses has been certified by the Information Systems Audit and Control Association. Graduates of this program qualify for one year of work experience toward the Certified Information Systems Auditor designation.

Option Code: 236

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 378</td>
<td>ACCOUNTING INFORMATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 371</td>
<td>BUSINESS DATA MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 372</td>
<td>BUSINESS INFORMATION SYSTEMS DESIGN AND DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 364</td>
<td>PROJECT MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours: 36

1 The professional business program requires completion of either BA 370 or ACTG 378. ACTG 378 is not included in the total credits completed within the option.

Option Code: 236

Dean's Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
The International Business option prepares students for positions in international business across national boundaries. Areas of greatest opportunity are with multinational firms; with governmental organizations; and in marketing and financial management areas of multinational firms. A career in international business can lead to exciting and rewarding opportunities abroad. Most multinational business firms, however, hire new employees first for domestic assignments in order to provide them with a thorough knowledge of the firm, its products, and its policies, or for specific assignments in one of the functional areas of the business, before providing overseas opportunities.

Because the majority of employees who eventually hold high-level positions in an international business start in entry-level positions within business areas, all international business students must also complete requirements for a primary discipline within a business. These disciplines include the majors in accountancy, business administration (Entrepreneurship, General Business, and Hospitality Management options), business information systems, finance, management and marketing.

Students earn this option with a minimum of one quarter term of study abroad through an international exchange or study abroad program approved by the College of Business. Students must complete a minimum of 18 quarter credits in business or business-related course work. The successfully completed course work must articulate back to OSU as courses that extend the knowledge and skills attained within the business core (that is, they cannot be used as a direct substitute for a business core course). Within the Arthur Stonehill International Business Exchange program offered through the College of Business, all courses offered by the partner schools are taught in English.

Option Code: 190

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>BA 349</td>
<td>IMPACT OF CULTURE ON BUSINESS</td>
<td>1</td>
</tr>
</tbody>
</table>

Select a minimum of 18 credits of business or business related course work

Total Hours 24

1. Completed on an approved international exchange or study aboard program

Students must earn this option with one term of study abroad through an approved College of Business international exchange. Courses in these programs are taught in English.

Option Code: 190

The Post-Baccalaureate Accounting Certificate program at OSU-Cascades is designed for students who have earned a Bachelor's degree in a non-accounting field. The curriculum supports the preparation for the Uniform Certified Public Accountant (CPA) Examination, and employment in professional accounting (public, private, or governmental).

Students who are interested in applying to the program should meet with the OSU-Cascades Business Advisor, Maribeth Erlich, to review program and application requirements.

maribeth.erlich@osucascades.edu
541-322-2090
Certificate Code: C191

The Post-Baccalaureate Accounting Certificate (PBAC) is designed for students who have earned one or more baccalaureate degrees and who wish to complete course work in preparation for taking the Uniform Certified Public Accountant examination and/or the Certified Management Accountant examination. The PBAC program includes courses in accounting directly related to preparation for the exams, as well as professional preparation for public or industry accounting.

Application Criteria

The following requirements must be fulfilled prior to registering for the upper-division accounting courses in the PBAC program. Students must also have earned a baccalaureate degree recognized by the OSU Office of Admissions.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 317</td>
<td>EXTERNAL REPORTING I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 318</td>
<td>EXTERNAL REPORTING II</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 319</td>
<td>EXTERNAL REPORTING III</td>
<td>4</td>
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<tr>
<td>ACTG 321</td>
<td>COST MANAGEMENT I</td>
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<tr>
<td>ACTG 378</td>
<td>ACCOUNTING INFORMATION MANAGEMENT</td>
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<tr>
<td>ACTG 424</td>
<td>TAXATION I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 427</td>
<td>ASSURANCE AND ATTESTATION SERVICES</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 36

Certificate Requirements

The PBAC requires successful completion of nine courses (36 credits); seven courses in required accounting courses (28 credits) and two accounting elective courses (8 credits).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 317</td>
<td>EXTERNAL REPORTING I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 318</td>
<td>EXTERNAL REPORTING II</td>
<td>4</td>
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<tr>
<td>ACTG 319</td>
<td>EXTERNAL REPORTING III</td>
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<tr>
<td>ACTG 321</td>
<td>COST MANAGEMENT I</td>
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<td>ACTG 324</td>
<td>TAXATION I</td>
<td>4</td>
</tr>
<tr>
<td>ACTG 424</td>
<td>ADVANCED ACCOUNTING</td>
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</tr>
<tr>
<td>ACTG 427</td>
<td>ADVANCED COST MANAGEMENT</td>
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Total Hours 28

Elective Accounting Courses

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<thead>
<tr>
<th>Code</th>
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<tr>
<td>ACTG 422</td>
<td>ADVANCED COST MANAGEMENT</td>
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<tr>
<td>ACTG 425</td>
<td>ADVANCED TAXATION</td>
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Total Hours 8

Apparel Design Undergraduate Major (BS, HBS)

The apparel design program focuses on market and consumer driven design. The program is designed to prepare students to be professionally ready for jobs in the athletic and outdoor industry. Graduates of the program will be literate in the business of fashion, design, production and marketing.

The Apparel Design major is a professional program (major code 400) offered through the College of Business. Entering students are designated as Pre-Apparel Design majors (major code 453). The lower-division pre-design program requires completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division design curricula. These courses must be completed before the student is eligible for admission to the upper-division studio-based curriculum. The lower-division pre-design core coursework may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

Admission to the upper-division studio-based Apparel Design major is competitive and is restricted to those students who have demonstrated an ability to achieve the high standards required for professional studies. Enrollment may be limited to the number of students who can be served by the faculty and facilities. To apply and be considered for admission, students must meet the following requirements:

* Be declared as a Pre-Apparel Design major.
* Have a minimum OSU cumulative GPA of 2.5, and a minimum cumulative GPA of 2.5 in all lower-division pre-Apparel Design.
* Have completed and received a C– or better in ALL courses within the lower-division pre-design core by the end of spring term before applying.

Students who have completed their lower-division design courses at a college or university other than OSU must be admitted to the pre-apparel design major their first term and apply to the apparel design major during the normal selection process (typically at the end of spring term each year). Admission into the apparel design major requires completion of DSGN 226 and submission of a portfolio. The portfolio will expect students to submit work that demonstrates competency in fundamental design skills and concepts.

The following courses are recommended for students who need to further develop those design skills:

ART 115 2-D CORE STUDIO
ART 117 3-D CORE STUDIO

Major Code: 400

Pre-Apparel Design Major Code: 453

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
</tr>
</thead>
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<td>ACTG 319</td>
<td>EXTERNAL REPORTING III</td>
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<td>ACTG 321</td>
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<tr>
<td>ACTG 324</td>
<td>TAXATION I</td>
<td>4</td>
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<td>ACTG 424</td>
<td>ADVANCED ACCOUNTING</td>
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</tr>
<tr>
<td>ACTG 427</td>
<td>ADVANCED COST MANAGEMENT</td>
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</table>

Total Hours 36

Summary of Requirements

Lower Division

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<tbody>
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<td>DSGN 226</td>
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Upper Division

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<tr>
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<tbody>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
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<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
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Professional Design Core Courses (39)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>DSGN 226</td>
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Apparel Design Courses (34)

University General Education Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ECON 201</td>
<td>INTRODUCTION TO MICROECONOMICS</td>
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</tbody>
</table>

Total Hours 73

Total Hours 24
Apparel Design Undergraduate Major (BS, HBS)

Unrestricted Electives 21
Total credits required for graduation 180

1. 21 credits from lower-division coursework satisfy University General Education Requirements
2. 11 credits from upper-division coursework satisfy University General Education Requirements

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<thead>
<tr>
<th>Code</th>
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<tr>
<td><strong>Design Core Curriculum</strong></td>
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<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
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<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
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<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>9</td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART NEOCLASSICISM TO CONTEMPORARY</td>
<td>3</td>
</tr>
<tr>
<td>or ART 205</td>
<td>*INTRODUCTION TO WESTERN ART GOTHIC TO BAROQUE</td>
<td>3</td>
</tr>
<tr>
<td>or ART 204</td>
<td>*INTRODUCTION TO WESTERN ART PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td>3</td>
</tr>
<tr>
<td>ART 367</td>
<td>*HISTORY OF DESIGN</td>
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</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>6</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td>6</td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td>6</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>or WR 323</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
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<table>
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<td>*INTRODUCTION TO MICROECONOMICS</td>
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<tr>
<td>ECON 205</td>
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<tr>
<td>ECON 203</td>
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<tr>
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<td>6</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>6</td>
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<tr>
<td>or WR 323</td>
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</tr>
<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
<td>6</td>
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<tr>
<td><strong>University General Requirements</strong></td>
<td><strong>24</strong></td>
<td></td>
</tr>
<tr>
<td>The ART, COMM, ECON, MTH, and WR classes above meet the university’s baccalaureate core requirements for Mathematics, Social Processes and Institutions, Writing II, Speech, Western Culture, Literature and Arts, and Science, Technology and Society. All students must meet the other baccalaureate core requirements and the other requirements for baccalaureate degrees. (See Earning a Degree at OSU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unrestricted Electives</strong></td>
<td><strong>21</strong></td>
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</tr>
<tr>
<td>Students are provided elective credits to enable them to achieve a degree of specialization and depth to match their interests</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 180

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**Apparel Design Major**

**Course**

Pre-Apparel Design **

Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the Apparel Design major from another college or university, will complete the following three-course sequence during their first year:

- BA 160 B-ENGAGED
- BA 161 INNOVATION NATION-AWARENESS TO ACTION
- BA 162 INNOVATION NATION-IDEAS TO REALITY

All other students will complete the following course:

- BA 101 BUSINESS NOW 6

All students should also complete:

- ART 101 *INTRODUCTION TO THE VISUAL ARTS 3
- COMM 111 *PUBLIC SPEAKING 3
- or COMM 114 *ARGUMENT AND CRITICAL DISCOURSE 3
- or COMM 218 *INTERPERSONAL COMMUNICATION 3
- DSGN 121 COMPUTER AIDED DESIGN 3
- MTH 111 *COLLEGE ALGEBRA 4

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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>8</td>
</tr>
<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>9</td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART NEOCLASSICISM TO CONTEMPORARY</td>
<td>3</td>
</tr>
<tr>
<td>or ART 205</td>
<td>*INTRODUCTION TO WESTERN ART GOTHIC TO BAROQUE</td>
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</tr>
<tr>
<td>or ART 204</td>
<td>*INTRODUCTION TO WESTERN ART PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td>3</td>
</tr>
<tr>
<td>ART 367</td>
<td>*HISTORY OF DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>6</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td>6</td>
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<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td>6</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>or WR 323</td>
<td>*ENGLISH COMPOSITION</td>
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</tr>
<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
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**General Baccalaureate Core courses**

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>WR 121</td>
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**Second Year**

All students should complete the following courses:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS (transfer students only)</td>
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<tr>
<td>DSGN 253</td>
<td>PROFESSIONAL DEVELOPMENT</td>
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<tr>
<td>DSGN 282</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I</td>
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<tr>
<td>DSGN 283</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II</td>
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</tr>
<tr>
<td>DSGN 284</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III</td>
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</tbody>
</table>

Students who transfer from another college or university into the pre-apparel design major who have completed all lower-division design core coursework should complete the following course:

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>BA 381</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
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</table>

All second-year students should also complete:

<table>
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<tbody>
<tr>
<td>ART 205</td>
<td>*INTRODUCTION TO WESTERN ART NEOCLASSICISM TO CONTEMPORARY</td>
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<tr>
<td>or ART 204</td>
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<td>3</td>
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<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
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<td>DSGN 226</td>
<td>SPECIFICATION BUYING</td>
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<tr>
<td>DSGN 244</td>
<td>COLOR INNOVATION</td>
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<td>DSGN 255</td>
<td>TEXTILES</td>
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<td>DSGN 281</td>
<td>DRAWING AND SKETCHING</td>
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<tr>
<td>ST 201</td>
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<tr>
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<tr>
<td>or WR 327</td>
<td>or *TECHNICAL WRITING</td>
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**Baccalaureate core, minor courses, or unrestricted electives**

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<th>Title</th>
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<tbody>
<tr>
<td><strong>Unrestricted Electives</strong></td>
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<tr>
<td>Students are provided elective credits to enable them to achieve a degree of specialization and depth to match their interests</td>
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Total Hours 180

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**Third Year**

<table>
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<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>ART 367</td>
<td>*HISTORY OF DESIGN</td>
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</tr>
<tr>
<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
<td>4</td>
</tr>
<tr>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td>4</td>
</tr>
<tr>
<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
<td>4</td>
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<tr>
<td>BA 390</td>
<td>MARKETING</td>
<td>4</td>
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<tr>
<td>or BA 223</td>
<td>or PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>DSGN 311</td>
<td>THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOP I</td>
<td>1</td>
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<tr>
<td>DSGN 312</td>
<td>THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOP II</td>
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<tr>
<td>DSGN 313</td>
<td>THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOP III</td>
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<td>DSGN 327</td>
<td>PERFORMANCE APPAREL INNOVATION I</td>
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<td>DSGN 329</td>
<td>SPORTWEAR INDUSTRY COLLABORATION</td>
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<td>DSGN 330</td>
<td>*FASHION FORECASTING AND MARKET ANALYSIS</td>
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<td>DSGN 333</td>
<td>HISTORY OF CONTEMPORARY FASHION</td>
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<tr>
<td>DSGN 341</td>
<td>DESIGN THINKING AND PROCESS INNOVATION</td>
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<tr>
<td>DSGN 356</td>
<td>SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS</td>
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<td>DSGN 357</td>
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**Fourth Year**

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**Hours**

180

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20-23
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## Pre-Appearance Design Major Code: 453

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<td>DSGN 413</td>
<td>FOURTH YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT III</td>
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<td>DSGN 428</td>
<td>TECHNICAL SPORTSWEAR SIZING AND FIT</td>
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<tr>
<td>DSGN 429</td>
<td>FUNCTIONAL DESIGN AND PRODUCT DEVELOPMENT</td>
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<tr>
<td>DSGN 475</td>
<td>*GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR</td>
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<tr>
<td>MGMT 364</td>
<td>PROJECT MANAGEMENT</td>
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<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
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<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
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<td><strong>Baccalaureate core, minor courses, or unrestricted electives</strong></td>
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* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

+ Courses cannot be counted twice to fulfill requirements of the major

++ Students entering design programs should have basic art and illustration skills. ART 115 and ART 117 are highly recommended elective courses
Dean's Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
- Business Information Systems - College of Business (p. 257)
- Design and Innovation Management - College of Business (p. 261)
- Finance - College of Business (p. 265)
- Interior Design - College of Business (p. 270)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)
- Merchandising Management - College of Business (p. 281)

The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean’s Academy Option provides students with:

- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean's Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design course work that have been designated as honors sections (i.e., the course has an "H" designation such as BA 160H). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean's Academy option requirements.

Business Administration Graduate Major (MBA, PhD)

Also available via Ecampus.

The Master of Business Administration program features an innovative, advanced business curriculum that ties together the functional disciplines of business. It is open to both business and non-business undergraduates. Core courses include business law, accounting, finance, operations, management and marketing.

The program provides the knowledge and skills that effective leaders need—preparing graduates to create, build and manage global enterprises that are socially responsible. Sustainable businesses operate deftly to simultaneously meet economic, social and environmental challenges. That’s why applied projects are woven into our curriculum—so our graduates are ready to make smart, bold moves that solve complex problems and make a positive impact on the world.

The MBA program is a place for students to pursue their dreams and push their boundaries. Students learn to build and lead teams, integrate disciplines, work under pressure and multitask—the same skills they will rely on when they leave campus.

For more information, email OSUMBA@oregonstate.edu or call 541-737-5510

Major Code: 2050

The MBA requires 60 credits of course work, including 15 credits of Core-1 courses, 27 credits of Core-2 courses, and 18 credits within one of the ten available graduate options:

1. Accounting
2. Business Analytics
3. Corporate Finance
5. Innovation Management
6. Marketing
7. Organizational Leadership
8. Research Thesis
9. Strategy, Entrepreneurship and Innovation
10. Supply Chain and Logistics Management

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BA 513</td>
<td>BUSINESS LEGAL ENVIRONMENT</td>
<td>3</td>
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<td>BA 514</td>
<td>OPERATIONS MANAGEMENT</td>
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<tr>
<td>BA 515</td>
<td>MANAGERIAL DECISION TOOLS</td>
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<tr>
<td>BA 516</td>
<td>CREATING VALUE IN EXCHANGE</td>
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<tr>
<td>BA 517</td>
<td>MARKETS AND VALUATION</td>
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<tr>
<td>BA 528</td>
<td>FINANCIAL AND COST ANALYSIS</td>
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<td>ORGANIZATION LEADERSHIP AND MANAGEMENT</td>
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<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
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OSU DSGN 413
FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III

Electives 2

Hours 15

Total Hours 180

This is a sample schedule intended for informational purposes only. Students should consult with their OSU academic advisor to create a personalized degree plan.
Accounting Graduate Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 240)

Graduate option for the PhD in Business Administration.

The primary objective of the accounting option is to train doctoral students for careers as professors at high-quality research-oriented universities. This training includes providing them with a program of course work that will prepare them to conduct quality accounting research, involving them in faculty-sponsored research projects as co-investigators and co-authors, and assimilating them into all aspects of the academic accounting profession (e.g., teaching, research, and service).

Option Code: 2058

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<td>BA 613</td>
<td>SEMINAR IN BUSINESS RESEARCH METHODS</td>
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<td>AEC 512</td>
<td>MICROECONOMIC THEORY I</td>
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<td>AEC 513</td>
<td>MICROECONOMIC THEORY II</td>
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<td>AEC 525</td>
<td>APPLIED ECONOMETRICS</td>
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<tr>
<td>AEC 625</td>
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<td>AEC 627</td>
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<tr>
<td>ST 511</td>
<td>METHODS OF DATA ANALYSIS</td>
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Core-1 Coursework 1

- BA 513 BUSINESS LEGAL ENVIRONMENT 3
- BA 514 OPERATIONS MANAGEMENT 3
- BA 515 MANAGERIAL DECISION TOOLS 3
- BA 516 CREATING VALUE IN EXCHANGE 3
- BA 517 MARKETS AND VALUATION 3

Core-2 Coursework

- BA 528 FINANCIAL AND COST ANALYSIS 3
- BA 540 CORPORATE FINANCE 3
- BA 550 ORGANIZATION LEADERSHIP AND MANAGEMENT 3
- BA 555 PRACTICAL BUSINESS ANALYSIS 3
- BA 561 SUPPLY CHAIN MANAGEMENT 3
- BA 569 ADVANCED STRATEGIC MANAGEMENT 3
- BA 572 ADVANCED INFORMATION SYSTEMS 3
- BA 590 MARKETING MANAGEMENT 3
- MGMT 559 MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY 3

Business Analytics Graduate Option-Specific Courses

- BA 573 DATA ANALYTICS FOR COMPETITIVE ADVANTAGE 3
- BA 574 DATA MANAGEMENT 3
- BA 575 DATA EXPLORATION AND VISUALIZATION 3
- BA 576 DATA AND TEXT MINING 3
- BA 577 INTEGRATED BUSINESS ANALYTICS PROJECT 3

Business Analytics Graduate Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 240)

Also available via Ecampus.

The MBA Business Analytics graduate option supports a rapidly-growing interest from organizations that need people who can integrate data sets and tools to address opportunities and risks. The information value of both in-house and third-party data sets can now be leveraged using powerful emerging technologies. Increasingly organizations leverage advances in software interoperability, data exchange mechanisms and data mining and visualization techniques to better understand their operations, customers, and markets. This trend has become known as ‘data mining,’ ‘business analytics,’ ‘business intelligence’ or, nowadays, ‘big data’.

Candidates with an undergraduate business major or minor can complete an MBA with business analytics in nine intensive months as full-time students. Other college graduates can take core-1 courses over the summer and join the cohort in the fall. Part-time students can complete the MBA over a longer time frame. A final capstone project and oral exam demonstrate a student’s ability to apply learned concepts.

Option Code: 2059

The Business Analytics graduate option requires 60 credits of coursework, including 15 credits of Core-1 courses, 27 credit hours of Core-2 courses, 15 credits within the Business Analytics graduate option, and 3 credits for an elective.

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<th>Hours</th>
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<td>BA 514</td>
<td>OPERATIONS MANAGEMENT</td>
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<td>BA 517</td>
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<td>ECON 560</td>
<td>INDUSTRIAL ORGANIZATION THEORY AND POLICY</td>
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<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>ST 551</td>
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<td>MGMT 559</td>
<td>MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
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Dissertation/Research

- BA 603 THESIS/DISSERTATION 36

Total Hours 119
Corporate Finance Graduate Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 240)

The Corporate Finance graduate option, within the Master of Business Administration (MBA) program, will provide training for students in financial issues at the firm level. These issues include the process by which companies raise capital, decide on a capital structure, implement hedging strategies, and develop governance structures. The option culminates in a capstone course in the market for corporate control where students will develop the ability to conduct analyses and valuation of transactions in this market. Graduates from this program will be well-suited for careers in traditional corporate finance settings, as well as in investment banking.

Candidates with an undergraduate business major or minor may be able to complete an MBA with a Corporate Finance graduate option in nine intensive months as full-time students. Other college graduates can take Core-1 courses over the summer and join the cohort in the fall. Part-time students can complete the MBA over a longer time frame.

Option Code: 2059

Corporate Finance Graduate Option Coursework

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Core-1 Coursework

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Core-2 Coursework

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<tr>
<td>MGMT 559</td>
<td>MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
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Human Resource Management Graduate Option

Human Resource Managers are tasked with finding and attracting diverse and global talent, creating fair and safe workplaces for all employees, developing and maintaining employees through their career stages, and helping people thrive in changing work environments. OSU’s Human Resource Management graduate option focuses on evidence-based and analytics-driven practices and includes course work that spans the traditional functions of the HR office, including best practices related to recruiting, hiring, on-boarding, compensation, and benefits.

Candidates with an undergraduate business major or minor may be able to complete an MBA with a Human Resource Management graduate option in nine intensive months as full-time students. Other college graduates can take Core-1 courses over the summer and join the cohort in the fall. Part-time students can complete the MBA over a longer time frame.

Option Code: 2063

Human Resource Management Graduate Option Coursework

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<td>MGMT 548</td>
<td>EMPLOYEE RECRUITMENT AND SELECTION</td>
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<td>MGMT 549</td>
<td>COMPENSATION MANAGEMENT</td>
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<td>MGMT 553</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
<td>4</td>
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<tr>
<td>MGMT 574</td>
<td>NEGOTIATIONS</td>
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Corporate Finance Graduate Option Coursework

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<td>FIN 549</td>
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Human Resource Management Graduate Option Coursework

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<td>MGMT 559</td>
<td>MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
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Total Hours

1 Core-1 requirements may be waived if a candidate has a recent undergraduate major in business, or has completed equivalent course work within an undergraduate business minor.
Core-1 requirements may be waived if a candidate has a recent undergraduate major in business, or has completed equivalent course work within an undergraduate business minor.

Option Code: 2065

Innovation Management Graduate Option

This option is offered within the following major(s):

• Business Administration - College of Business (p. 240)

Also available via Ecampus.

The Innovation Management graduate option, within the Master of Business Administration (MBA) program, emphasizes innovation, technology commercialization, and entrepreneurship to prepare graduates to assume leadership roles in emerging businesses. This MBA graduate option provides the student background, tools and experiential learning in the management of innovative business and technical concepts. A core element of the Innovation Management graduate option is the completion of a self-paced experiential project based on development/analysis of an innovative business or technical concept.

Length: The MBA curriculum can be completed within an intensive one-year timeframe. Part-time students, taking six to nine credits per quarter, can complete the program in two years on campus or in Portland.

Learning Outcomes:

• Develop a research-driven, investor-ready lean canvas business model and plan to take an innovative idea to market

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BA 560</td>
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<td>BA 567</td>
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<tr>
<td>BA 570</td>
<td>INNOVATION STRATEGY, IP, AND NPD</td>
<td>3</td>
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<tr>
<td>BA 568</td>
<td>INTEGRATED BUSINESS PROJECT</td>
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• Present a compelling argument for funding

<table>
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<td>BA 567</td>
<td>SELECTED TOPICS IN MANAGEMENT</td>
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<td>BA 568</td>
<td>INTEGRATED BUSINESS PROJECT</td>
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Option Code: 2062

The Innovation Management MBA graduate option requires 60 credits of coursework, including 15 credits of Core-1 courses, 27 credits of Core-2 courses, and 18 credits within the Innovation Management graduate option.

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Innovation Management Graduate Option Coursework

<table>
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<tr>
<td>BA 531</td>
<td>BUSINESS LAW - TECHNOLOGY/NEW VENTURES</td>
<td>3</td>
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<tr>
<td>BA 560</td>
<td>VENTURE PLANNING</td>
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<td>BA 562</td>
<td>MANAGING PROJECTS</td>
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<tr>
<td>BA 567</td>
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<td>BA 568</td>
<td>INTEGRATED BUSINESS PROJECT</td>
<td>3</td>
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<tr>
<td>BA 570</td>
<td>INNOVATION STRATEGY, IP, AND NPD</td>
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</tbody>
</table>

Total Hours: 60

Core-1 requirements may be waived if a candidate has a recent undergraduate major in business, or has completed equivalent course work within an undergraduate business minor.

Option Code: 2054

Marketing Graduate Option

This option is offered within the following major(s):

• Business Administration - College of Business (p. 240)

Also available via Ecampus.

Marketing is the science of identifying, measuring, and satisfying the demand of a market and is the key driver of firm strategy and the marketing perspective requires managers to consider every interaction the customer has with the company. Marketing students learn to incorporate customer insights and innovative problem-solving to develop and communicate marketing strategy in the digital age. OSU's Marketing MBA emphasizes marketing theory and application, strategic thinking, and sustainable and ethical decision-making. The Marketing (MRKT) option prepares students for careers in digital marketing and multinational marketing at entities including Fortune 500 companies and other for-profit businesses, government, and non-governmental entities with “in-house” market research departments.

Option Code: 2054

This option requires 60 credit hours of coursework including 15 credit hours of Business Foundations (Core 1) coursework, 27 credit hours of general MBA coursework (Core 2), and 18 credit hours of marketing coursework. Students will complete a comprehensive option capstone project in MRKT 592.

<table>
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<tr>
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<th>Hours</th>
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<td>BA 515</td>
<td>MANAGERIAL DECISION TOOLS</td>
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<td>BA 516</td>
<td>CREATING VALUE IN EXCHANGE</td>
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<tr>
<td>BA 517</td>
<td>MARKETS AND VALUATION</td>
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</table>

Note: Core-1 requirements may be waived if a candidate has a recent undergraduate major in business, or has completed equivalent course work within an undergraduate business minor.

Core 2 (27 credits)

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<th>Hours</th>
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<td>CORPORATE FINANCE</td>
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<td>ORGANIZATION LEADERSHIP AND MANAGEMENT</td>
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<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
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</table>
Organizational Leadership Graduate Option

This option is offered within the following major(s):

• Business Administration - College of Business (p. 240)

Also available via Ecampus.

The Organizational Leadership graduate option, within the Master of Business Administration (MBA) program, is designed to serve leaders and professionals from any industry. The program will be delivered on the Corvallis campus, and in Portland as an online/hybrid program in partnership with OSU Ecampus. The number of in-person sessions required for each individual online/hybrid course will depend on the courses learning objectives, with in-person sessions delivered in the Collaborative Life Sciences facility in Portland.

Key Benefits:

• Flexible and affordable program that helps prepare students for leadership roles in established and emerging business organizations.

• Online/hybrid classes blend face-to-face and online sessions to maximize learning and flexibility.

• Management and leadership course content similar to educational content provided in top ranking executive MBA programs.

Length: Part-time students, taking at most two courses per academic quarter, can complete the program in 21 months.

Learning Outcomes: Upon completion of this graduate degree option, graduates will be able to:

• Understand, analyze, and apply ethics frameworks to facilitate corporate social responsibility and ethical decision making (MGMT 559).

• Understand, analyze, and apply human resource management information to facilitate executive level strategic decision making (MGMT 572).

• Understand, analyze, and apply classical and modern leadership theories and techniques to facilitate leadership effectiveness (BA 550, MGMT 559).

• Understand, analyze and apply negotiation techniques toward attainment of organizational objectives (MGMT 574).

Option Code: 2061

The Organizational Leadership graduate option requires 60 credits of course work, including 15 credits of Core-1 courses, 27 credits of Core-2 courses, 12 credits within the Organizational Leadership graduate option, and 6 credits for the Integrative Capstone Experience.

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<thead>
<tr>
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<td>BA 540</td>
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<td>BA 574</td>
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<td>BA 533</td>
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<td>MGMT 576</td>
<td>INTEGRATIVE CAPSTONE II</td>
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</table>

Total Hours 60

1 Core-1 requirements may be waived if a candidate has a recent undergraduate major in business, or has completed equivalent course work within an undergraduate business minor.

Option Code: 2061

Research Thesis Graduate Option

This option is offered within the following major(s):

• Business Administration - College of Business (p. 240)

The Research Thesis graduate option, within the Master of Business Administration (MBA) program, is intended to offer students and College
of Business faculty with joint research interests, an opportunity to engage in research as part of the student’s MBA program. Students can design, execute, and report on business research problems and their solutions. These may include an analysis of existing academic literature and the formulation of research questions and research plans. Students may also collect and analyze data and report on research findings in both an oral and written format.

Option Code: 2056

The Research Thesis graduate option requires a minimum of 46 credits of course work, including 33 credits of general MBA courses and a minimum of 13 credits within the Research Thesis graduate option.

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<tr>
<th>Code</th>
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<th>Hours</th>
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<td>FINANCIAL AND COST ANALYSIS</td>
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<td>BA 531</td>
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<td>BA 543</td>
<td>FINANCIAL MARKETS AND INSTITUTIONS</td>
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<td>BA 550</td>
<td>ORGANIZATION LEADERSHIP AND MANAGEMENT</td>
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<td>SUPPLY CHAIN MANAGEMENT</td>
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<td>BA 562</td>
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Research Thesis Graduate Option

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<tr>
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<td>BA 505</td>
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</table>

Option Code: 2056

Strategy, Entrepreneurship, and Innovation Graduate Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 240)

Graduate option for the PhD in Business Administration.

The primary objective of the Strategy, Entrepreneurship and Innovation option is to train doctoral students for careers as professors at high-quality research-oriented universities. This training includes providing them with a program of course work that will prepare them to conduct quality research in strategy and entrepreneurship as well as management and marketing, involving them in faculty-sponsored research projects as co-investigators and co-authors, and assimilating them into all aspects of academics related to innovation and commercialization (e.g., teaching, research, and service).

Option Code: 2064

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<thead>
<tr>
<th>Code</th>
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<tr>
<td>BA 611</td>
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<td>BA 612</td>
<td>FOUNDATIONS OF BUSINESS RESEARCH</td>
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<td>BA 613</td>
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</table>

Other sample courses include (but are not limited to):

- AEC 525 APPLIED ECONOMETRICS
- AEC 625 ADVANCED ECONOMETRICS I
- AEC 627 COMPUTATIONAL ECONOMICS
- ST 511 METHODS OF DATA ANALYSIS

Advanced Program

- BA 602 INDEPENDENT STUDY
- BA 660 FOUNDATIONS OF ENTREPRENEURSHIP RESEARCH
- BA 661 DOCTORAL SEMINAR IN ORGANIZATIONAL THEORY
- BA 662 CORPORATE ENTREPRENEURSHIP AND NEW VENTURES
- BA 663 STRATEGIC MANAGEMENT
- BA 664 TECHNOLOGY AND INNOVATION MANAGEMENT
- MGMT 650 ORGANIZATIONAL BEHAVIOR
- MRKT 690 MARKETING AND COMMERCIALIZATION

Additional Courses to Fulfill PhD Requirements

Sample courses include (but are not limited to):

- AEC 611 ADVANCED MICROECONOMIC THEORY I
- ECON 520 GAME THEORY
- ECON 560 INDUSTRIAL ORGANIZATION THEORY AND POLICY
- ST 512 METHODS OF DATA ANALYSIS
- ST 513 METHODS OF DATA ANALYSIS
- ST 551 STATISTICAL METHODS
- ST 552 STATISTICAL METHODS

Dissertation/Research

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1 BA 611 is a one-credit course which must be taken twice.

Option Code: 2064

Supply Chain and Logistics Management Graduate Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 240)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

The Supply Chain and Logistics Management (SCLM) graduate option, within the Master of Business Administration (MBA) program, offers students an alternative focus for their MBA that includes acquiring a solid mastery of international operations and supply chain and logistics management concepts and methods.

This MBA graduate option prepares graduates for operations, logistics and supply chain management in the service and manufacturing industries. In the past two decades, the loss of manufacturing jobs in the U.S. triggered attrition of innovation capabilities across many sectors of the economy contributing to the current anemic economic recovery. The U.S. needs a professionally-trained workforce that is able to manage internal operations and global supply chains in the manufacturing and service sectors and in government agencies. Well-trained operations and supply chain managers are also needed in global companies that operate outside the U.S., including companies that operate in the Asia-Pacific Rim.

Learning Outcomes: Graduates will acquire a solid mastery of global supply chain and international operations management concepts and methods.

- Effectively use concepts of operations and supply chain management and qualitative and quantitative methods to make appropriate
decisions in international business contexts that include new and unfamiliar situations.

- Design appropriate management plans for global supply chains that are lawful, ethical and environmentally and socially responsible.
- Develop a global outlook that reflects changes experienced and anticipated by firms and industries and understand the requirements for effective change management in global operations and supply chains.

**Length:** The MBA curriculum can be completed within an intensive one-year time frame. Part-time students, taking six to nine credits per quarter, can complete the program in two years on campus or in Portland.

**Option Code: 2060**

The SCLM graduate option requires 60 credits of coursework, including 15 credits of Core-1 courses, 27 credits of Core-2 courses, 15 credits within the SCLM graduate option, and 3 credits from a list of electives.

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<td>BA 514</td>
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<td>BA 515</td>
<td>MANAGERIAL DECISION TOOLS</td>
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<td>BA 516</td>
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<td>BA 517</td>
<td>MARKETS AND VALUATION</td>
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<td>BA 528</td>
<td>FINANCIAL AND COST ANALYSIS</td>
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<td>BA 540</td>
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<td>PRACTICAL BUSINESS ANALYSIS</td>
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<td>BA 569</td>
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<td>MGMT 559</td>
<td>MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
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<th>Code</th>
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<tbody>
<tr>
<td>BA 551</td>
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<td>BA 557</td>
<td>GLOBAL LOGISTICS MANAGEMENT FUNDAMENTALS AND STRATEGY</td>
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<td>SERVICE OPERATIONS MANAGEMENT</td>
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<td>BA 578</td>
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<tr>
<td>BA 573</td>
<td>DATA ANALYTICS FOR COMPETITIVE ADVANTAGE</td>
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</tbody>
</table>

**Business Administration Graduate Minor**

Non-College of Business graduate students interested in the Business Administration minor should contact Graduate Business Programs, College of Business, Austin Hall 326, OSU, Corvallis, OR 97331-2603 or email osumba@bus.oregonstate.edu

**Minor Code: 2049**

**Business Administration Undergraduate Major (BA, BS, HBA, HBS)**

Also available at OSU-Cascades, OSU-Portland and via Ecampus.

**Major Code: 181**

The undergraduate curriculum in business administration reflects the increasingly complex economic, social, and technological aspects of modern business decision-making. Course work emphasizes the development of effective decision-making, an understanding of personal values and motivation, and the awareness of the interrelationships between business and society.

Business Administration major requirements are divided into two parts—lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division business curricula. The lower-division business core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
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<td>BA 514</td>
<td>OPERATIONS MANAGEMENT</td>
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<td>BA 515</td>
<td>MANAGERIAL DECISION TOOLS</td>
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<td>BA 517</td>
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<td>MGMT 559</td>
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<td>LEAN ENTERPRISE MANAGEMENT AND CAPSTONE</td>
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<td>GLOBAL LOGISTICS MANAGEMENT FUNDAMENTALS AND STRATEGY</td>
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<td>SERVICE OPERATIONS MANAGEMENT</td>
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</tr>
<tr>
<td>BA 578</td>
<td>SUPPLY CHAIN ANALYTICS</td>
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</table>

**Restrictive Elective Courses**

Select one course from the following:

- BA 531 BUSINESS LAW - TECHNOLOGY/NEW VENTURES
- BA 562 MANAGING PROJECTS
- BA 573 DATA ANALYTICS FOR COMPETITIVE ADVANTAGE

**Total Hours**

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tr>
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<td>BA 562</td>
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<tr>
<td>BA 573</td>
<td>DATA ANALYTICS FOR COMPETITIVE ADVANTAGE</td>
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</tbody>
</table>

**Programming Requirements**

- **Core-1 Coursework:**
  - 10 credits from the lower-division business core satisfy University General Education Requirements
- **Core-2 Coursework:**
  - 41–44 Unrestricted Electives

**Total credits required for graduation:**

**Options and minors are available to provide specializations**

**Business Administration Program Requirements (180)**

**Business Administration Core Curriculum (78–81)**

The business administration core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate course work and
further develop decision-making skills through the analysis of business cases.

<table>
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<tr>
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<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Economics</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>Written and Oral Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>or WR 323</td>
<td>*ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
<td></td>
</tr>
</tbody>
</table>

University General Requirements 3 40
Unrestricted Electives 2 41-44
Minor 3 27
Option 4 23-28

1. MTH 241; ECON 201/ECON 202; WR 222, WR 323 or WR 327; and COMM 111, COMM 114 or COMM 218 meet the University’s Baccalaureate Core requirements for mathematics, social processes and institutions, writing II, and speech, respectively. All students must meet the other baccalaureate core requirements and the other requirements for baccalaureate degrees. (See Earning a Degree at OSU (p. 1609))

2. Students are provided elective credits to enable them to achieve a degree of specialization and depth to match their interests

3. Students are encouraged to choose a non-business university-approved minor that consists of a minimum of 27 credits, with at least 12 credits at the upper-division level. Students are responsible for determining whether the minor has been approved for transcript visibility and to request the notation on their transcript. Students may also choose to complete a coherent set of non-business courses to support their career goals

4. Options are designed to allow students to extend their professional preparation beyond the introductory level in one or more areas. There are 10 options available to the Business Administration major:
   1. Digital Marketing (Ecampus only)
   2. Entrepreneurship for Business Majors (Corvallis only)
   3. Family Business (Corvallis and Ecampus)
   4. General Business (Available at OSU-Cascades and Ecampus)
   5. Hospitality Management (OSU-Cascades only)
   6. International Business (requires participation in study abroad program)
   7. Marketing (Ecampus only)
   8. Merchandising Management (Corvallis only)
   9. Retail Management (Ecampus only)
   10. Supply Chain and Logistics Management (Corvallis and Ecampus)

Some options need to be started in the third year, while others can be completed all during the fourth year. See an academic advisor for more information.

## Business Administration Major

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Year</td>
<td></td>
</tr>
<tr>
<td>Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the business administration major from another college or university, will complete the following three-course sequence during their first year:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td></td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION--AWARENESS TO ACTION</td>
<td></td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION--IDEAS TO REALITY</td>
<td></td>
</tr>
<tr>
<td>All other students, including students completing their degree at OSU-Cascades or via OSU Ecampus, will complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 101</td>
<td>BUSINESS NOW</td>
<td>6</td>
</tr>
<tr>
<td>All students should also complete:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>or *INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>Baccalaureate core, unrestricted electives 29-32 42-45 Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Second Year</td>
<td></td>
</tr>
<tr>
<td>All students in the business administration major, except those completing their degree at OSU-Cascades, should complete the following courses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP</td>
<td>1</td>
</tr>
<tr>
<td>DEVELOPMENT I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
<td>1</td>
</tr>
<tr>
<td>BA 284</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP</td>
<td>1</td>
</tr>
<tr>
<td>DEVELOPMENT III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students completing their degree at OSU-Cascades should complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 253</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>All second-year students should also complete:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>or BA 390</td>
<td>or MARKETING</td>
<td></td>
</tr>
<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td>4</td>
</tr>
<tr>
<td>BA 240</td>
<td>FINANCE</td>
<td>4</td>
</tr>
<tr>
<td>or BA 360</td>
<td>or INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
</tr>
<tr>
<td>BA 270</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 275</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Third Year</td>
<td></td>
</tr>
<tr>
<td>BA 311</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>BA 312</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II</td>
<td>1</td>
</tr>
<tr>
<td>BA 313</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III</td>
<td>1</td>
</tr>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td>4</td>
</tr>
<tr>
<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL</td>
<td>4</td>
</tr>
<tr>
<td>RESPONSIBILITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 370</td>
<td>BUSINESS INFORMATION SYSTEMS OVERVIEW</td>
<td>4</td>
</tr>
<tr>
<td>or ACTG 378</td>
<td>or ACCOUNTING INFORMATION MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 375</td>
<td>APPLIED QUANTITATIVE METHODS</td>
<td>4</td>
</tr>
</tbody>
</table>
Dean's Academy Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td>3</td>
</tr>
<tr>
<td>BC Science</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION 1 or COMM 111 or COMM 114 or COMM 218</td>
<td>3</td>
</tr>
<tr>
<td>or Math through MTH 241</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION–AWARNESS TO ACTION</td>
<td>3</td>
</tr>
<tr>
<td>BC Science</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION 1 or COMM 111 or COMM 114 or COMM 218</td>
<td>3</td>
</tr>
<tr>
<td>or Math through MTH 241</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION–IDEAS TO REALITY</td>
<td>3</td>
</tr>
<tr>
<td>BC Science</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION (or Bacc Core - Fitness, Speech, CD, DPD) 1</td>
<td>3</td>
</tr>
<tr>
<td>or Bacc Core - Fitness, Speech, CD, DPD</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td>4</td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
</tr>
<tr>
<td>BA 275</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
<td>4</td>
</tr>
<tr>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>BA 270</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>180</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

This option is offered within the following major(s):
- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean’s Academy option provides students with:

- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean's Academy option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design course work that have been designated as honors sections (i.e., the course has an “H” designation such as BA 160H (https://catalog.oregonstate.edu/search/?P=BA%20160H/)). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean's Academy option requirements.

Option Code: 754

Digital Marketing Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Available only via Ecampus.

The Digital Marketing option, within the Business Administration (BA) undergraduate major, offers students a focus that includes acquiring a solid mastery of digital marketing strategy, planning, design, and evaluation.

The Digital Marketing Option requires a total of 24 credits beyond the undergraduate business core.

Option Code: 749

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 481</td>
<td>INTRODUCTION TO BUSINESS ANALYTICS</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 484</td>
<td>DIGITAL MEDIA AND MARKETING INTEGRATION</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 485</td>
<td>SEARCH ENGINE MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 486</td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 493</td>
<td>INTEGRATED MARKETING COMMUNICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

1 Currently offered online through OSU Ecampus

Option Code: 749

Entrepreneurship for Business Majors Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

The Entrepreneurship for Business Majors option prepares students to establish their own business, to operate in growing businesses, to become involved in family-owned businesses, or to work with innovative divisions within larger organizations. The program combines classroom study with case analysis to provide students with the knowledge and skills necessary for success.

Option Code: 624

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 363</td>
<td>TECHNOLOGY AND INNOVATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 458</td>
<td>INNOVATION AND NEW PRODUCT DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 460</td>
<td>VENTURE MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 464</td>
<td>NEW VENTURE FINANCING</td>
<td>4</td>
</tr>
<tr>
<td>BA 467</td>
<td>NEW VENTURE LABORATORY</td>
<td>4</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>BA 362</td>
<td>SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES</td>
<td></td>
</tr>
<tr>
<td>BA 365</td>
<td>FAMILY BUSINESS MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 463</td>
<td>FAMILY ENTERPRISE GOVERNANCE</td>
<td></td>
</tr>
<tr>
<td>BA 468</td>
<td>TECHNOLOGY COMMERCIALIZATION</td>
<td></td>
</tr>
<tr>
<td>MRKT 488</td>
<td>PERSONAL SELLING</td>
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</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

Option Code: 624

Family Business Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Family businesses are the dominant form of economic organization within the state of Oregon and the Pacific Northwest. It is vital to understand the dynamics within a family business to arm family members and non-family consultants and executives with the knowledge they need to help the family firm succeed.

The curriculum of the Family Business option is intended to prepare students for leadership positions within a family firm. With a focus on entrepreneurship, it offers students the opportunity to develop their entrepreneurial talents while providing a solid foundation on the risks and challenges facing a family firm, including finances, legal issues,
marketing and succession planning. The curriculum will prepare future family business leaders to balance the well-being of the business, the family, and individuals, as they address the challenges and opportunities which inevitably arise, day to day and during succession.

**Option Code: 786**

The Family Business option requires a total of 24 credits beyond the undergraduate business core.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 365</td>
<td>FAMILY BUSINESS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 460</td>
<td>VENTURE MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 463</td>
<td>FAMILY ENTERPRISE GOVERNANCE</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

Select two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 458</td>
<td>INNOVATION AND NEW PRODUCT DEVELOPMENT</td>
<td>8</td>
</tr>
<tr>
<td>BA 464</td>
<td>NEW VENTURE FINANCING</td>
<td></td>
</tr>
<tr>
<td>MGMT 455</td>
<td>INFLUENCE AND NEGOTIATION</td>
<td></td>
</tr>
<tr>
<td>MGMT 488</td>
<td>PERSONAL SELLING</td>
<td></td>
</tr>
<tr>
<td>MGMT 495</td>
<td>RETAIL MANAGEMENT</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 24

**Option Code: 786**

**General Business Option**

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Also available at OSU-Cascades and via Ecampus.

**Option Code: 201**

All students in the General Business option must take 24 credits of upper-division College of Business courses in addition to the undergraduate business core curriculum. A minimum of 12 credits must be 400 level. Courses must be pre-approved by an advisor prior to beginning this option.

**Option Code: 201**

**Hospitality Management Option**

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Available only at OSU-Cascades and via Ecampus.

Course work within the Hospitality Management Option is aimed at developing the students’ knowledge of strategic thinking and its application to the hospitality industry. We define the hospitality industry as including all organizations that provide overnight accommodations and/or food service, to include hotels, destination resorts, hospitals, residence halls, cruise ships, etc.

The proposed courses were selected based on research on workforce development needs, feedback from industry partners/advisors and how these courses would compliment the existing business major curriculum. Input from prospective and existing students in the Hospitality Management Degree was also considered. Specifically, the decision to offer the option through Ecampus was primarily driven from this feedback.

Students graduating from the program are required to possess knowledge of forces in the hospitality industry’s environment that drive change. Furthermore, they should be able to assess the impact of these forces on the hospitality industry, which will enable them to appreciate the cause and effect relationship between the forces that drive change and the firms within the industry. This, in essence, will provide students with the tools to be effective leaders in the hospitality industry.

**Option Code: 491**

**International Business Option**

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Business Administration - College of Business (p. 246)
- Business Information Systems - College of Business (p. 257)
- Finance - College of Business (p. 265)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)

Also available at OSU-Cascades.

The International Business option prepares students for positions in organizations engaged in international trade. Students study the economic, political, geographical, and socio-cultural factors that impact business across national boundaries. Areas of greatest opportunity for overseas assignments are with service organizations such as banks, consulting firms and accounting firms; with import/export firms; with governmental organizations; and in marketing and financial management areas of multinational firms. A career in international business can lead to exciting and rewarding opportunities abroad. Most multinational business firms, however, hire new employees first for domestic assignments in order to provide them with a thorough knowledge of the firm, its products, and its policies, or for specific assignments in one of the functional areas of the business, before providing overseas opportunities.

Because the majority of employees who eventually hold high-level positions in an international business start in entry-level positions within business areas, all international business students must also complete requirements for a primary discipline within a business. These disciplines include the majors in accountancy, business administration (Entrepreneurship, General Business, and Hospitality Management options), business information systems, finance, management and marketing.
Students earn this option with a minimum of one quarter term of study abroad through an international exchange or study abroad program approved by the College of Business. Students must complete a minimum of 18 quarter credits in business or business-related course work. The successfully completed course work must articulate back to OSU as courses that extend the knowledge and skills attained within the business core (that is, they cannot be used as a direct substitute for a business core course). Within the Arthur Stonehill International Business Exchange program offered through the College of Business, all courses offered by the partner schools are taught in English.

**Option Code: 190**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>BA 349</td>
<td>IMPACT OF CULTURE ON BUSINESS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Select 18 credits of business or business related course work (^1)</td>
<td>18</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

\(^1\) Completed on an approved international exchange or study abroad program

Students must earn this option with one term of study abroad through an approved College of Business international exchange. Courses in these programs are taught in English.

**Option Code: 190**

**Marketing Option**

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Available only via Ecampus.

The Marketing option, within the Business Administration (BA) undergraduate major, provides students with a solid mastery of marketing concepts and methods.

**Option Code: 753**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 290</td>
<td>INTRODUCTION TO CAREERS IN MARKETING</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 396</td>
<td>FUNDAMENTALS OF MARKETING RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 486</td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 493</td>
<td>INTEGRATED MARKETING COMMUNICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>23</td>
</tr>
</tbody>
</table>

**Option Code: 753**

**Merchandising Management Option**

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Students in the Merchandising Management option prepare for retail management positions, merchandising positions related to product development and manufacturing, and merchandising positions related to retail. In a global, diverse, and fast-paced, competitive environment, merchandisers are involved in market analysis, business planning, assortment planning, sourcing, pricing, distribution and visual presentation of apparel and textile products to satisfy the needs of the consumer.

**Option Code: 782**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSGN 255</td>
<td>TEXTILES</td>
<td>4</td>
</tr>
<tr>
<td>DSGN 276</td>
<td>INTRODUCTION TO MERCHANDISING MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>DSGN 339</td>
<td>FASHION FORECASTING AND MARKET ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>DSGN 377</td>
<td>RETAIL AND MERCHANDISING</td>
<td>4</td>
</tr>
<tr>
<td>DSGN 471</td>
<td>RETAIL PRESENTATION STRATEGIES</td>
<td>4</td>
</tr>
<tr>
<td>DSGN 472</td>
<td></td>
<td>4</td>
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<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
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<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
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<td>Total Hours</td>
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\(^1\) Writing Intensive Course (WIC)

**Retail Management Option**

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Available only via Ecampus.

The Retail Management option covers management and marketing strategies for the retail industry. The program includes all the steps required to bring the customers into the store and fulfill their buying needs. A retail store manager is responsible for ensuring that a store operates efficiently and profitably and that its employees perform adequately. They are responsible for a store’s sales and employee schedule, resolving problems that arise in the store and coordinating a store’s activities.

All courses in the Retail Management option are offered via Ecampus.

**Option Code: 744**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 457</td>
<td>SUPPLY CHAIN STRATEGY</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>BA 451</td>
<td>SUPPLY AND SOURCING MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 481</td>
<td>INTRODUCTION TO BUSINESS ANALYTICS</td>
<td></td>
</tr>
<tr>
<td>MGMT 364</td>
<td>PROJECT MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>MGMT 455</td>
<td>INFLUENCE AND NEGOTIATION</td>
<td></td>
</tr>
<tr>
<td>MRKT 396</td>
<td>FUNDAMENTALS OF MARKETING RESEARCH</td>
<td></td>
</tr>
<tr>
<td>MRKT 488</td>
<td>PERSONAL SELLING</td>
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</tr>
<tr>
<td>MRKT 493</td>
<td>INTEGRATED MARKETING COMMUNICATIONS</td>
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<tr>
<td>MRKT 497</td>
<td>GLOBAL MARKETING</td>
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<tr>
<td>MRKT 498</td>
<td>SERVICES MARKETING</td>
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</table>
Supply Chain and Logistics Management Option

This option is offered within the following major(s):

- Business Administration - College of Business (p. 246)

Also available via Ecampus.

The Supply Chain and Logistics Management (SCLM) option, within the Business Administration (BA) undergraduate major, offers students an alternative focus that includes acquiring a solid mastery of international operations and supply chain and logistics management concepts and methods.

This undergraduate option prepares graduates for operations, logistics, procurement and supply chain management in the service and manufacturing industries. In the past two decades, the loss of manufacturing jobs in the U.S. triggered attrition of innovation capabilities across many sectors of the economy contributing to the current anemic economic recovery. The U.S. needs a professionally-trained workforce that is able to manage internal operations and global supply chains in the manufacturing and service sectors and in government agencies. Well-trained operations and supply chain managers are also needed in global companies that operate outside the U.S., including companies that operate in the Asia-Pacific Rim.

Entry Requirements: Admission to professional-school for this option requires earning a 2.50 cumulative GPA in pre-business course work and all pre-business course work either completed with a grade of C– or better or registered to complete.

The Supply Chain and Logistics Management option requires a total of 24 credits beyond the undergraduate business core.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 451</td>
<td>SUPPLY AND SOURCING MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 454</td>
<td>LEAN ENTERPRISE MANAGEMENT AND CAPSTONE</td>
<td>3</td>
</tr>
<tr>
<td>BA 459</td>
<td>SERVICE OPERATIONS MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 478</td>
<td>SUPPLY CHAIN ANALYTICS</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 355</td>
<td>PROJECT MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 455</td>
<td>INFLUENCE AND NEGOTIATION</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 457</td>
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<tr>
<td>Total Hours</td>
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<td>24</td>
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</table>

Business Analytics Undergraduate Major (BS, HBS)

Also available via Ecampus.

In the business analytics core, students will be introduced to topics and techniques associated with data mining, data visualization, text mining, and advanced statistical tools and techniques.

Business Analytics major requirements are divided into two parts – lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division Business Analytics and business curricula. The lower-division business core coursework may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>BA 572</td>
<td>ADVANCED INFORMATION SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>BA 573</td>
<td>DATA ANALYTICS FOR COMPETITIVE ADVANTAGE</td>
<td>3</td>
</tr>
<tr>
<td>BA 574</td>
<td>DATA MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 575</td>
<td>DATA EXPLORATION AND VISUALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>BA 576</td>
<td>DATA AND TEXT MINING</td>
<td>3</td>
</tr>
<tr>
<td>BA 577</td>
<td>INTEGRATED BUSINESS ANALYTICS PROJECT</td>
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<td>Total Hours</td>
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</table>

Business Analytics Graduate Certificate

Also available via Ecampus.

Today's organizations—businesses, corporations, nonprofits and others—want to better utilize available information in operational, tactical, and strategic decision making. The information value of both in-house and third party data sets can now be leveraged using powerful emerging technologies. Increasingly organizations leverage advances in software interoperability, data exchange mechanisms and data mining and visualization techniques to better understand their operations, customers, and markets. This trend has become known as 'data mining,' 'business analytics,' 'business intelligence' or, nowadays, 'big data.'

This certificate is targeted at three types of professionals:

- Managers seeking to expand the use of data analytics within their organizations.
- Information systems professionals charged with marshaling available organizational data for analytical processes.
- Business analytics professionals performing data analysis to support decision making, strategy formation, and operational improvement.

Certificate Code: CG14

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>BA 572</td>
<td>ADVANCED INFORMATION SYSTEMS</td>
<td>3</td>
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<tr>
<td>BA 573</td>
<td>DATA ANALYTICS FOR COMPETITIVE ADVANTAGE</td>
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<tr>
<td>BA 574</td>
<td>DATA MANAGEMENT</td>
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</tr>
<tr>
<td>BA 575</td>
<td>DATA EXPLORATION AND VISUALIZATION</td>
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</tr>
<tr>
<td>BA 576</td>
<td>DATA AND TEXT MINING</td>
<td>3</td>
</tr>
<tr>
<td>BA 577</td>
<td>INTEGRATED BUSINESS ANALYTICS PROJECT</td>
<td>3</td>
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<tr>
<td>Total Hours</td>
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</tr>
</tbody>
</table>

Certificate Code: CG14

Business Analytics Undergraduate Major (BS, HBS)

Also available via Ecampus.

In the business analytics core, students will be introduced to topics and techniques associated with data mining, data visualization, text mining, and advanced statistical tools and techniques.

Major Code: 899

Business Analytics major requirements are divided into two parts – lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division Business Analytics and business curricula. The lower-division business core coursework may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>BA 572</td>
<td>ADVANCED INFORMATION SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>BA 573</td>
<td>DATA ANALYTICS FOR COMPETITIVE ADVANTAGE</td>
<td>3</td>
</tr>
<tr>
<td>BA 574</td>
<td>DATA MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 575</td>
<td>DATA EXPLORATION AND VISUALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>BA 576</td>
<td>DATA AND TEXT MINING</td>
<td>3</td>
</tr>
<tr>
<td>BA 577</td>
<td>INTEGRATED BUSINESS ANALYTICS PROJECT</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

Option Code: 899

Business Analytics Graduate Certificate

Also available via Ecampus.

Today's organizations—businesses, corporations, nonprofits and others—want to better utilize available information in operational, tactical, and strategic decision making. The information value of both in-house and third party data sets can now be leveraged using powerful emerging technologies. Increasingly organizations leverage advances in software interoperability, data exchange mechanisms and data mining and visualization techniques to better understand their operations, customers, and markets. This trend has become known as 'data mining,' 'business analytics,' 'business intelligence' or, nowadays, 'big data.'

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Certificate Code: CG14

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 555</td>
<td>PRACTICAL BUSINESS ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>BA 572</td>
<td>ADVANCED INFORMATION SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>BA 573</td>
<td>DATA ANALYTICS FOR COMPETITIVE ADVANTAGE</td>
<td>3</td>
</tr>
<tr>
<td>BA 574</td>
<td>DATA MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 575</td>
<td>DATA EXPLORATION AND VISUALIZATION</td>
<td>3</td>
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<tr>
<td>BA 576</td>
<td>DATA AND TEXT MINING</td>
<td>3</td>
</tr>
<tr>
<td>BA 577</td>
<td>INTEGRATED BUSINESS ANALYTICS PROJECT</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>
11 credits from lower-division business core satisfy University General Education Requirements

3 credits from upper-division business core satisfy University General Education Requirements

Business Analytics Core Curriculum (85-91)
The business analytics core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate coursework and further develop decision-making skills through the analysis of business cases.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or BA 163</td>
<td>B-ENGAGED</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION--AWARENESS TO ACTION</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION--IDEAS TO REALITY</td>
<td>3</td>
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</tbody>
</table>

All other students, including Ecampus students, will complete the following course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Core</th>
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<tbody>
<tr>
<td>BA 101</td>
<td>BUSINESS NOW</td>
<td>6</td>
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</table>

All students should also complete:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td>3</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
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</tbody>
</table>

Second Year

All second year students should complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
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<tr>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
<td>1</td>
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<tr>
<td>BA 284</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III</td>
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<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
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<tr>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
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<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>or BA 390</td>
<td>MARKETING</td>
<td>4</td>
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<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BA 240</td>
<td>FINANCE</td>
<td>4</td>
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<tr>
<td>or BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td>4</td>
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<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
<td></td>
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<td>BA 270</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
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<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
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Total Hours: 13

Major Code: 899

Fourth Year

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>BA 411</td>
<td>FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
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<tr>
<td>BA 412</td>
<td>THE DESIGN THINKING CHALLENGE</td>
<td>1</td>
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<tr>
<td>BA 413</td>
<td>FINANCIAL PLANNING II</td>
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<tr>
<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
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Total Hours: 7

Major Code: 899

First Year

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>Fall</td>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td>3</td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>Bio Bacc Core Lab Science</td>
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Total Hours: 14

Winter

<table>
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<th>Core</th>
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<tbody>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION--AWARENESS TO ACTION</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
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</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td>3</td>
<td></td>
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<tr>
<td>Phys Bacc Core Lab Science</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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</table>

Total Hours: 16

Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION--IDEAS TO REALITY</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>Bio/Phys Bacc Core Lab Science</td>
<td>4</td>
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<tr>
<td>PAC course</td>
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Total Hours: 15

Second Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 4
Dean's Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
- Business Information Systems - College of Business (p. 257)
- Design and Innovation Management - College of Business (p. 261)
- Finance - College of Business (p. 265)
- Interior Design - College of Business (p. 270)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)
- Merchandising Management - College of Business (p. 281)

The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean's Academy Option provides students with:

- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean's Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design course work that have been designated as honors sections (i.e., the course has an "H" designation such as BA 160H). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean's Academy option requirements.

Option Code: 754
Digital Marketing Analytics Option

This option is offered within the following major(s):
  • Business Analytics - College of Business (p. 252)

Also available via Ecampus.

Digital Marketing Analysts apply sophisticated methods to analyze big data and solve marketing problems such as consumer analysis, customer segmentation and micro-targeting. The Digital Marketing Analytics option further develops analytical skills associated with Customer Relationship Management (CRM), web analytics, social media marketing and analytics, and marketing analytics.

Option Code: 903

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRKT 477</td>
<td>INTEGRATED MARKETING ANALYTICS PROJECT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 484</td>
<td>DIGITAL MEDIA AND MARKETING INTEGRATION</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 485</td>
<td>SEARCH ENGINE MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 486</td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 493</td>
<td>INTEGRATED MARKETING COMMUNICATIONS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

Option Code: 903

Human Resource Analytics Option

This option is offered within the following major(s):
  • Business Analytics - College of Business (p. 252)

Also available via Ecampus.

Although broadly defined, human resources analytics is basically a sector within the broader field of analytics that involves the application of analytic processes within a human resource department for the purpose of improving employee performance. Specifically, human resources analytics involves providing insight regarding the process of gathering data and making advantageous, relevant decisions about how human resource processes can be improved upon. The Human Resource Analytics option trains students to use a data-driven approach to managing people-related issues, such as recruiting, performance evaluation, hiring and promotion, compensation, and employee retention.

Option Code: 902

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 448</td>
<td>EMPLOYEE RECRUITMENT AND SELECTION</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 449</td>
<td>COMPENSATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 452</td>
<td>LEADERSHIP</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 455</td>
<td>INFLUENCE AND NEGOTIATION</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 477</td>
<td>INTEGRATED HUMAN RESOURCE ANALYTICS PROJECT</td>
<td>4</td>
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<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

Option Code: 902

Market Research and Consumer Analytics Option

This option is offered within the following major(s):
  • Business Analytics - College of Business (p. 252)

Also available via Ecampus.

Market research analysts collect and analyze data to study market conditions and help businesses to promote their services and products. These professionals gather and interpret data on consumer demographics, needs, preferences and buying habits by using statistical techniques and software.

Option Code: 904

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRKT 396</td>
<td>FUNDAMENTALS OF MARKETING RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 477</td>
<td>INTEGRATED MARKETING ANALYTICS PROJECT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 486</td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 491</td>
<td>QUALITATIVE RESEARCH METHODS</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
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<tr>
<td>MRKT 496</td>
<td>MARKETING RESEARCH PRACTICUM</td>
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</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>24</strong></td>
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</tbody>
</table>

Option Code: 904

Business and Entrepreneurship Minor

Also available at OSU-Cascades and via Ecampus.

This program was renamed ‘Business Minor’ in Winter 2019.

The Business and Entrepreneurship minor teaches students to recognize business opportunities, equips them with skills to secure funding, and provides insight on how to manage the commercialization of the business opportunity. Fundamental business classes are combined with those designed to specifically address the challenges of launching a new venture or an idea within an existing organization. With an innovative curriculum taught by dedicated professors, the Business and Entrepreneurship minor provides a fundamental stepping stone on the road to identifying and commercializing business opportunities in any type of organization.

Interested students must view an online orientation (http://business.oregonstate.edu/advising/business-entrepreneurship-minor/) and meet requirements stated therein before they can declare the minor.

Minor Code: 574

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required Courses</strong></td>
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<tr>
<td></td>
<td>Select one of the following:</td>
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<tr>
<td></td>
<td>BA 215 FUNDAMENTALS OF ACCOUNTING</td>
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</tr>
<tr>
<td></td>
<td>BA 211 FINANCIAL ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; BA 213 and MANAGERIAL ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BA 230 BUSINESS LAW I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>BA 260 INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>BA 314 SUSTAINABLE BUSINESS OPERATIONS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>BA 351 MANAGING ORGANIZATIONS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>or BA 352 MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>BA 360 INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td></td>
</tr>
</tbody>
</table>

Option Code: 902
Business Fundamentals Graduate Certificate

The BFGC program provides a means for individuals with undergraduate degrees in fields other than business to gain exposure to, and understanding of, basic functional business skills. Skills acquired in this program can expand performance and career opportunities in both not-for-profit and for-profit organizations. The curriculum can be completed in as little as one summer, or on a part time basis.

Certificate Code: CG18

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Core</td>
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<tr>
<td>BA 513</td>
<td>BUSINESS LEGAL ENVIRONMENT</td>
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<tr>
<td>BA 514</td>
<td>OPERATIONS MANAGEMENT</td>
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<tr>
<td>BA 515</td>
<td>MANAGERIAL DECISION TOOLS</td>
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</tr>
<tr>
<td>BA 516</td>
<td>CREATING VALUE IN EXCHANGE</td>
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<tr>
<td>BA 517</td>
<td>MARKETS AND VALUATION</td>
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<tr>
<td>Elective</td>
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<tr>
<td>Total Hours</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

Financial Planning Graduate Option

This option gives current wealth management professionals a graduate credential and qualify them to seek the Certified Financial Planner designation. Financial Planning focuses on the individual and the discipline around wealth management, tax, estate, retirement, and insurance planning. The role of the financial planner is to both understand the goals and resources of a client and to plan and communicate options for the client to achieve these goals. At many levels, the financial planner is tasked with aiding clients to form a realistic understanding of their economic condition and prospects and to aid in maintaining and building their clients’ economic standing.

Option Code: 2068

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Coursework</td>
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<tr>
<td>BA 540</td>
<td>CORPORATE FINANCE</td>
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<td>FIN 542</td>
<td>INVESTMENTS</td>
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<tr>
<td>FIN 550</td>
<td>FUNDAMENTALS OF FINANCIAL PLANNING</td>
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<tr>
<td>FIN 551</td>
<td>INSURANCE PLANNING AND TAX PLANNING</td>
<td>4</td>
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<tr>
<td>FIN 552</td>
<td>FINANCIAL PLANNING II</td>
<td>3</td>
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<td>FIN 553</td>
<td>FINANCIAL PLANNING III</td>
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<td>MRKT 588</td>
<td>PERSONAL SELLING</td>
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<tr>
<td>Elective</td>
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<td>Total Hours</td>
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</table>

Marketing Insights and Analytics Graduate Option

This option is offered within the following major(s):
Marketing is the science of identifying, measuring, and satisfying the demand of a market. Marketing is a key driver of firm strategy and the marketing perspective requires managers to consider every interaction the customer has with the company. Marketing students learn to incorporate customer insights and innovative problem-solving to develop and communicate marketing strategy. Data analytics leverages advances in software interoperability, data exchange mechanisms, and data mining/visualization techniques to better understand operations, customers, and markets. The combination of Marketing Insights, which provides the theoretical understanding of determinants of customer behavior, and Business Analytics, which provides the big data analytical techniques, helps to provide the critical link between the promise of abundant data and actionable insights gleaned from these data.

Option Code: 2047

Supply Chain Analytics Graduate Option

This option is offered within the following major(s):

• Business (MSB) - College of Business (p. 256)

Also available via Ecampus.

This option targets the efficient allocation of resources marshalled for an economic purpose and to inform this process utilizing the wealth of business data available. Supply Chain Analytics specifically stimulates economic growth and social progress through the optimization of processes throughout the supply chain based on the collection and analysis of substantial data.

Option Code: 2069

Business Information Systems Undergraduate Major (BA, BS, HBA, HBS)

The Business Information Systems (BIS) curriculum teaches you to harness technology to help organizations achieve a competitive advantage in today’s rapidly changing environment.

You will gain a firm foundation in business administration and learn to analyze, develop and manage information systems. Depending on your skills and interests you might become a business process analyst, IT project manager, application specialist, data modeler, systems analyst, software quality tester, developer or database administrator, or choose from other technology-oriented business careers.

You will not just learn theory. You have plenty of opportunities to build, troubleshoot, refine and manage information systems through targeted exercises in real-world projects. Projects sponsored by outside companies help you learn to bring together people, business processes, and information technology.

Major Code: 183

Business Information Systems (BIS) major requirements are divided into two parts – lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division BIS and business curricula. The lower-division business core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

<table>
<thead>
<tr>
<th>Option Code: 2047</th>
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<tbody>
<tr>
<td><strong>Coursework</strong></td>
</tr>
<tr>
<td>BA 573</td>
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<tr>
<td>BA 574</td>
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<td>BA 575</td>
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<td>BA 576</td>
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<td>BA 590</td>
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<td>MRKT 584</td>
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<td>MRKT 585</td>
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<td>MRKT 586</td>
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<td><strong>Required Capstone</strong></td>
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<td>MRKT 592</td>
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<td>or BA 577</td>
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<td><strong>Total Hours</strong></td>
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<th>Option Code: 2069</th>
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<tbody>
<tr>
<td><strong>Coursework</strong></td>
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<td>BA 551</td>
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<td>BA 555</td>
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<td>BA 561</td>
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<tr>
<td>BA 574</td>
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<tr>
<td>BA 575</td>
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<tr>
<td>BA 576</td>
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<tr>
<td><strong>Summary of Requirements</strong></td>
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<tr>
<td>Lower Division</td>
</tr>
<tr>
<td>BIS Core Classes</td>
</tr>
<tr>
<td>Math, Economics, Writing and Communications</td>
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<tr>
<td>Upper Division</td>
</tr>
<tr>
<td>Business Core Classes</td>
</tr>
<tr>
<td>BIS Courses (28)</td>
</tr>
<tr>
<td>University General Education Requirements</td>
</tr>
<tr>
<td>Unrestricted Electives</td>
</tr>
<tr>
<td><strong>Total credits required for graduation</strong></td>
</tr>
</tbody>
</table>

(1) 10 credits from lower-division course work satisfy University General Education Requirements
Business Administration Core Curriculum (78–81)
The business administration core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate course work and further develop decision-making skills through the analysis of business cases.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
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</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<tr>
<td>COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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</tr>
<tr>
<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
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</tbody>
</table>

Select one of the following:

- WR 222 | *ENGLISH COMPOSITION                              | 3     |
- WR 322 | *ENGLISH COMPOSITION                              |       |
- WR 327 | *TECHNICAL WRITING                                |       |

University General Requirements 1 40

Unrestricted Electives 9-12

1 MTH 241, ECON 201/ECON 202, WR 222, WR 323 or WR 327, and COMM 111, COMM 114, or COMM 218 meet the university’s baccalaureate core requirements for mathematics, social processes and institutions, writing II, and speech, respectively. All students must meet the other baccalaureate core requirements and the other requirements for baccalaureate degrees. (See Earning a Degree at OSU.)

Professional Business Information Systems

Course Title Hours

First Year

Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the business information systems major from another college or university, will complete the following three-course sequence during their first year:

- BA 160 | B-ENGAGED 2                                         |       |
- BA 161 | INNOVATION NATION—AWARENESS TO ACTION 2            |       |
- BA 162 | INNOVATION NATION—IDEAS TO REALITY 2               |       |

All other students will complete the following course:

- BA 101 | BUSINESS NOW                                       | 6     |

All students should also complete:

- COMM 111 | *PUBLIC SPEAKING                                   | 3     |
- COMM 114 | *ARGUMENT AND CRITICAL DISCOURSE                   |       |
- COMM 218 | *INTERPERSONAL COMMUNICATION                       |       |
- MTH 241 | *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE        | 4     |

Baccalaureate core, unrestricted electives 31

Second Year

All students should complete the following courses*:

- BA 280 | BUSINESS INSIGHTS (Transfer students only)         |       |
- BA 281 | PROFESSIONAL DEVELOPMENT                            | 3     |
- BA 282 | PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I | 1     |
- BA 283 | CREATIVITY, CULTURE, AND THE WORKPLACE              | 1     |
- BA 284 | PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III | 1    |

- Students who transfer from another college or university into the business information systems major who have completed all lower-division business core course work should complete the following course:

- BA 381 | PERSONAL AND PROFESSIONAL DEVELOPMENT               |       |

All second-year students should also complete:

- BA 211 | FINANCIAL ACCOUNTING                               | 4     |
- BA 213 | MANAGERIAL ACCOUNTING                              | 4     |
- BA 223 | PRINCIPLES OF MARKETING                             | 4     |
- BA 230 | BUSINESS LAW II                                    | 4     |
- BA 240 | FINANCE                                            | 4     |
- BA 260 | INTRODUCTION TO ENTREPRENEURSHIP                   | 4     |
- BA 270 | BUSINESS PROCESS MANAGEMENT                        | 4     |
- BA 275 | FOUNDATIONS OF STATISTICAL INFERENCE               | 4     |
- ECON 201 | *INTRODUCTION TO MICROECONOMICS                   | 4     |
- ECON 202 | *INTRODUCTION TO MACROECONOMICS                   | 4     |

Third Year

- ACTG 378 | ACCOUNTING INFORMATION MANAGEMENT                  | 4     |
- BA 272 | BUSINESS APPLICATION DEVELOPMENT                   | 4     |
- BA 311 | THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT | 1    |
- BA 312 | THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II | 1    |
- BA 313 | THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III | 1   |
- BA 347 | INTERNATIONAL BUSINESS                             | 4     |
- BA 352 | MANAGING INDIVIDUAL AND TEAM PERFORMANCE           | 4     |
- BA 357 | OPERATIONS MANAGEMENT                              | 4     |
- BA 354 | *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY | 4    |
- BA 371 | BUSINESS DATA MANAGEMENT                           | 4     |
- BA 372 | BUSINESS INFORMATION SYSTEMS DESIGN AND DEVELOPMENT | 4    |
- BA 375 | APPLIED QUANTITATIVE METHODS                       | 4     |
- WR 222 | *ENGLISH COMPOSITION                               | 3     |
- WR 322 | *ENGLISH COMPOSITION                               |       |
- WR 327 | *TECHNICAL WRITING                                 |       |

Baccalaureate core, minor, option or unrestricted electives 31

Fourth Year

- BA 411 | FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I | 1     |
- BA 412 | THE DESIGN THINKING CHALLENGE                      | 1     |
- BA 413 | FINANCIAL PLANNING II                              | 1     |
- BA 466 | INTEGRATIVE STRATEGIC EXPERIENCE                   | 4     |
- BA 479 | BUSINESS TELECOMMUNICATIONS AND NETWORKING         | 4     |
- BA 480 | INFORMATION SYSTEMS SECURITY                       | 4     |
- BA 483 | BUSINESS ANALYTICS                                 | 4     |
- MGMT 364 | PROJECT MANAGEMENT                               | 4     |

Total Hours 84
Baccalaureate core, minor, option or unrestricted electives 22

Hours 45

Total Hours 180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Major Code: 183

Sample Four-Year Plan: Business Information Systems

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td>3</td>
</tr>
<tr>
<td>BC Science</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION (Alpha coded) or PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCOURSE or *INTERPERSONAL COMMUNICATION</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 111</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or COMM 114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math through MTH 241</td>
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<td>BA 161</td>
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<tr>
<td>BC Science</td>
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<td>WR 121</td>
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<tr>
<td>or COMM 111</td>
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<td>or COMM 114</td>
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<td>or COMM 218</td>
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<td>BA 162</td>
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<td>Bacc Core: Fitness, Speech, CD DPD Electives</td>
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<td>BA 275</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
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<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
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<td>BA 240</td>
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<td>Hours</td>
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<td>APPLIED QUANTITATIVE METHODS</td>
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<td>BA 412</td>
<td>THE DESIGN THINKING CHALLENGE</td>
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<td>BA 479</td>
<td>BUSINESS TELECOMMUNICATIONS AND NETWORKING</td>
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<td>BA 480</td>
<td>INFORMATION SYSTEMS SECURITY</td>
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<tr>
<td>Spring</td>
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<tr>
<td>BA 413</td>
<td>FINANCIAL PLANNING II</td>
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<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
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<td>BA 483</td>
<td>BUSINESS ANALYTICS</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Dean's Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
International Business Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Business Administration - College of Business (p. 246)
- Business Information Systems - College of Business (p. 257)
- Finance - College of Business (p. 265)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)

The International Business option prepares students for positions in organizations engaged in international trade. Students study the economic, political, geographical, and socio-cultural factors that impact business across national boundaries. Areas of greatest opportunity for overseas assignments are with service organizations such as banks, consulting firms and accounting firms; with import/export firms; with governmental organizations; and in marketing and financial management areas of multinational firms. A career in international business can lead to exciting and rewarding opportunities abroad.

Most multinational business firms, however, hire new employees first for domestic assignments in order to provide them with a thorough knowledge of the firm, its products, and its policies, or for specific assignments in one of the functional areas of the business, before providing overseas opportunities.

Because the majority of employees who eventually hold high-level positions in an international business start in entry-level positions within business areas, all international business students must also complete requirements for a primary discipline within a business. These disciplines include the majors in accountancy, business administration (Entrepreneurship, General Business, and Hospitality Management options), business information systems, finance, management and marketing.

Students earn this option with a minimum of one quarter term of study abroad through an international exchange or study abroad program approved by the College of Business. Students must complete a minimum of 18 quarter credits in business or business-related course work. The successfully completed course work must articulate back to OSU as courses that extend the knowledge and skills attained within the business core (that is, they cannot be used as a direct substitute for a business core course). Within the Arthur Stonehill International Business Exchange program offered through the College of Business, all courses offered by the partner schools are taught in English.

Option Code: 190

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
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<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>BA 349</td>
<td>IMPACT OF CULTURE ON BUSINESS</td>
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<tr>
<td></td>
<td>Select a minimum of 18 credits of business or business related course work</td>
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<td><strong>Total</strong></td>
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</table>

1 Completed on an approved international exchange or study abroad program

Students must earn this option with one term of study abroad through an approved College of Business international exchange. Courses in these programs are taught in English.

Option Code: 190

Business Minor

Also available at OSU-Cascades and via Ecampus (http://ecampus.oregonstate.edu/online-degrees/undergraduate/minors/).

The Business Minor allows students to attain a basic understanding of the fundamentals of business essential to any career path. Students will develop an understanding of the language of business that will enable them to comprehend and communicate financial information, organizational behavior, marketing and operations.

Interested students must view an online orientation (http://business.oregonstate.edu/advising/business-entrepreneurship-minor/) and meet requirements stated therein before they can declare the minor.

Minor Code: 803
Design and Innovation Management Major (BS, HBS)

The Design and Innovation Management Major is a professional program offered through the College of Business. This program is designed for students who want a management role in a design field. Gain necessary skills in marketing, finance, leadership, strategy, and supply chain. This option provides students with an integrated focus on the role of design in the creation and management of strategic and sustainable advantage.

Major Code: 912

The Design and Innovation Management major requirements are divided into two parts—lower-division and upper-division. The lower-division design core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division design curricula. The lower-division design core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4-6</td>
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<tr>
<td>or BA 167 &amp; BA 168</td>
<td>LAUNCH PAD I and LAUNCH PAD II</td>
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<tr>
<td>BA 314</td>
<td>SUSTAINABLE BUSINESS OPERATIONS</td>
<td>4</td>
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<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
<td>4-8</td>
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<tr>
<td>or BA 211 &amp; BA 213</td>
<td>FINANCIAL ACCOUNTING and MANAGERIAL ACCOUNTING</td>
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<tr>
<td>BA 330</td>
<td>LEGAL ENVIRONMENT OF BUSINESS</td>
<td>4</td>
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<tr>
<td>or BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
<td>4</td>
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<tr>
<td>or BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
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<tr>
<td>BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td>3-4</td>
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<td>or BA 240</td>
<td>FINANCE</td>
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<td>or ENGR 390</td>
<td>ENGINEERING ECONOMY</td>
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<td>BA 390</td>
<td>MARKETING</td>
<td>4</td>
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<td>or BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
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<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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<tr>
<td>or AEC 311</td>
<td>INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS</td>
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* Baccalaureate Core Course (BCC)

Note: Registration access to the alternative ‘or’ courses is generally not allowed for minors. However, some students may have access to them via Honors College or previous status as a business major.

Minor Code: 803

Design and Innovation Management Undergraduate Major (BS, HBS)

The Design and Innovation Management Major is a professional program offered through the College of Business. This program is designed for students who want a management role in a design field. Gain necessary skills in marketing, finance, leadership, strategy, and supply chain. This option provides students with an integrated focus on the role of design in the creation and management of strategic and sustainable advantage.

Major Code: 912

The Design and Innovation Management major requirements are divided into two parts—lower-division and upper-division. The lower-division design core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division design curricula. The lower-division design core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.
Dean’s Academy Option

Second Year
All students should complete the following courses:

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS (transfer students only)</td>
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<tr>
<td>DSGN 253</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
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<tr>
<td>DSGN 282</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT</td>
<td>1</td>
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<tr>
<td>DSGN 283</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT</td>
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<tr>
<td>DSGN 284</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT</td>
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Students who transfer from another college or university into the design and innovation management major who have completed all lower-division design core course work should complete the following course:

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BA 381</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
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All second-year students should also complete:

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<th>Course Code</th>
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<tr>
<td>ART 205</td>
<td>*INTRODUCTION TO WESTERN ART NEOCLASSICISM TO CONTEMPORARY</td>
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<td>or ART 204</td>
<td>or ART 205 *INTRODUCTION TO WESTERN ART. PREHISTORY TO THE HIGH MIDDLE AGES</td>
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<td>or ART 205</td>
<td>or ART 205 *INTRODUCTION TO WESTERN ART. GOTHIC TO BAROQUE</td>
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<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
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<td>DSGN 244</td>
<td>COLOR INNOVATION</td>
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<td>DSGN 255</td>
<td>TEXTILES</td>
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<td>DSGN 283</td>
<td>DRAWING AND SKETCHING</td>
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<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
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<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
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<td>WR 222</td>
<td>*ENGLISH COMPOSITION or WR 322 or WR 327 or *TECHNICAL WRITING</td>
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Baccalaureate core, minor courses, or unrestricted electives

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<td>MGMT 364</td>
<td>MARKETING</td>
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<td>or BA 223</td>
<td>or PRINCIPLES OF MARKETING</td>
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<tr>
<td>DSGN 311</td>
<td>THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
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<td>or DSGN 313</td>
<td>or THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
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<td>or DSGN 341</td>
<td>or DESIGN THINKING AND PROCESS INNOVATION</td>
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<td>or DSGN 342</td>
<td>or INTRODUCTION TO DESIGN MANAGEMENT</td>
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<td>or DSGN 343</td>
<td>or IDEA VISUALIZATION</td>
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<td>or DSGN 356</td>
<td>or SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS</td>
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Baccalaureate core, minor courses, or unrestricted electives

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<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
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Baccalaureate core, minor courses, or unrestricted electives

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Third Year

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<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
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<td>BA 352</td>
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<td>4</td>
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<tr>
<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
<td>4</td>
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<td>BA 390</td>
<td>MARKETING</td>
<td>4</td>
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<tr>
<td>or BA 223</td>
<td>or PRINCIPLES OF MARKETING</td>
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<td>DSGN 311</td>
<td>THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
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<td>or DSGN 312</td>
<td>or THIRD YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
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<td>or DSGN 342</td>
<td>or INTRODUCTION TO DESIGN MANAGEMENT</td>
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<td>or IDEA VISUALIZATION</td>
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<tr>
<td>or DSGN 356</td>
<td>or SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 364</td>
<td>or PROJECT MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

Baccalaureate core, minor courses, or unrestricted electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

Baccalaureate core, minor courses, or unrestricted electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Hours</td>
<td>183</td>
</tr>
</tbody>
</table>

Fourth Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSGN 411</td>
<td>FOURTH YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
<td>1</td>
</tr>
<tr>
<td>or DSGN 412</td>
<td>or FOURTH YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
<td>1</td>
</tr>
<tr>
<td>or DSGN 413</td>
<td>or FOURTH YEAR PERSONAL, PROFESSIONAL, &amp; LEADERSHIP DEVELOPMENT</td>
<td>1</td>
</tr>
<tr>
<td>or DSGN 440</td>
<td>or DESIGN RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>or DSGN 441</td>
<td>or SERVICE DESIGN INNOVATION</td>
<td>4</td>
</tr>
<tr>
<td>or DSGN 442</td>
<td>or MATERIALITY AND MAKING FIELD PROJECT</td>
<td>4</td>
</tr>
<tr>
<td>or DSGN 475</td>
<td>or *GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR (or *Bacc Core CGI)</td>
<td>4</td>
</tr>
</tbody>
</table>

Baccalaureate core, minor courses, or unrestricted electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Hours</td>
<td>183</td>
</tr>
</tbody>
</table>

Major Code: 912

Dean’s Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
- Business Information Systems - College of Business (p. 257)
- Design and Innovation Management - College of Business (p. 261)
- Finance - College of Business (p. 265)
- Interior Design - College of Business (p. 270)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)
- Merchandising Management - College of Business (p. 281)

The Dean’s Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean’s Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean’s Academy Option provides students with:

- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean’s Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design course work that have been designated as honors sections (i.e., the course has an "H" designation such as BA 160H). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean’s Academy option requirements.
Entrepreneurship and Innovation Management Graduate Minor

The graduate minor in Entrepreneurship and Innovation Management emphasizes innovation, technology commercialization, and entrepreneurship to prepare graduate students to create research-driven, investor-ready lean canvas business models and plans to take an innovative idea to market.

Only non-COB graduate students are eligible to complete the Entrepreneurship and Innovation Management graduate minor.

Minor Code: 2066

This minor requires 15 credits of course work for Master's programs and 18 credits of course work for Doctoral programs.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 560</td>
<td>VENTURE PLANNING</td>
<td>3</td>
</tr>
<tr>
<td>BA 567</td>
<td>SELECTED TOPICS IN MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 568</td>
<td>INTEGRATED BUSINESS PROJECT</td>
<td>3</td>
</tr>
<tr>
<td>BA 569</td>
<td>ADVANCED STRATEGIC MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 570</td>
<td>INNOVATION STRATEGY, IR AND NPD</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

1 Doctoral students take one additional graduate course from the College of Business as an elective (3 credits)

Minor Code: 2066

Entrepreneurship Minor

The Entrepreneurship minor teaches you to recognize business opportunities, equips you with skills to secure funding, and provides insight on how to manage the commercialization of the business opportunity. Fundamental business classes are combined with those designed to specifically address the challenges of launching a new venture or an idea within an existing organization. With an innovative curriculum taught by dedicated professors, the Entrepreneurship minor provides a fundamental stepping-stone on the road to identifying and commercializing business opportunities in any type of organization.

Minor Code: 809

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required Courses</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Microeconomics</strong></td>
<td></td>
</tr>
<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>or ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td></td>
</tr>
<tr>
<td>or ENGR 390</td>
<td>ENGINEERING ECONOMY</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Accounting</strong></td>
<td></td>
</tr>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>&amp; BA 213</td>
<td>and MANAGERIAL ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td>or BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Introduction to Entrepreneurial Processes</strong></td>
<td></td>
</tr>
<tr>
<td>BA 167</td>
<td>LAUNCH PAD I</td>
<td>4-6</td>
</tr>
<tr>
<td>&amp; BA 168</td>
<td>and LAUNCH PAD II</td>
<td></td>
</tr>
<tr>
<td>or BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Venture Finance</strong></td>
<td></td>
</tr>
<tr>
<td>BA 464</td>
<td>NEW VENTURE FINANCING</td>
<td>4</td>
</tr>
</tbody>
</table>
Family Business Minor

Family businesses are the dominant form of economic organization within the state of Oregon and the Pacific Northwest. It is vital to understand the dynamics within a family business to arm family members and non-family consultants and executives with the knowledge they need to help the family firm succeed.

The Family Business minor is intended to prepare students for leadership positions within a family firm. With a focus on entrepreneurship, it offers students the opportunity to develop their entrepreneurial talents while providing a solid foundation on the risks and challenges facing a family firm, including finances, legal issues, marketing and succession planning. The curriculum will prepare future family business leaders to balance the

| Minor Code: 809 |

| Total Hours | 27-29 |

* Baccalaureate Core Course (BCC)  
^ Writing Intensive Course (WIC)
well-being of the business, the family and individuals, as they address
the challenges and opportunities which inevitably arise, day to day and
during succession.

Minor Code: 783

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 215</td>
<td>FUNDAMENTALS OF ACCOUNTING *</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING &amp; BA 213 and MANAGERIAL ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP *</td>
<td>4</td>
</tr>
<tr>
<td>BA 351</td>
<td>MANAGING ORGANIZATIONS *</td>
<td>4</td>
</tr>
<tr>
<td>or BA 252</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td></td>
</tr>
<tr>
<td>BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT *</td>
<td>4</td>
</tr>
<tr>
<td>or FIN 340</td>
<td>FINANCE</td>
<td></td>
</tr>
<tr>
<td>BA 365</td>
<td>FAMILY BUSINESS MANAGEMENT *</td>
<td>4</td>
</tr>
<tr>
<td>BA 390</td>
<td>MARKETING *</td>
<td>4</td>
</tr>
<tr>
<td>BA 463</td>
<td>FAMILY ENTERPRISE GOVERNANCE *</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS *</td>
<td>4</td>
</tr>
<tr>
<td>or AEC 311</td>
<td>INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS</td>
<td></td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
* Currently offered online through OSU Ecampus

Minor Code: 783

Finance Minor

The College of Business Finance Minor allows students to expand their
field of study and specialize within a quantitative and applied business
discipline. The minor is best-suited for students with either a current
quantitative major, or a strong interest in working with numbers. Within
the minor students may pursue either a general finance, corporate
finance, or investment specialization. The minor will offer potential
opportunities for students who wish to leverage their existing major and
distinguish themselves for employment within many business settings,
including a corporation, non-profit, or start-up.

Minor Code: 813

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>or AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
<td>4-8</td>
</tr>
<tr>
<td>or BA 211</td>
<td>FINANCIAL ACCOUNTING &amp; BA 213 and MANAGERIAL ACCOUNTING</td>
<td></td>
</tr>
<tr>
<td>BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>or BA 240</td>
<td>FINANCE</td>
<td></td>
</tr>
</tbody>
</table>

Specializations

Select one of the following specializations: 12

General Finance Specialization (12 credits)

| Code | Title | |
|------|-------||
| FIN 341 | INVESTMENTS | |
| or FIN 342 | ADVANCED FINANCIAL MANAGEMENT | |

Select two of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 440</td>
<td>FIXED INCOME SECURITIES</td>
</tr>
<tr>
<td>FIN 441</td>
<td>FINANCIAL INSTITUTIONS</td>
</tr>
<tr>
<td>FIN 442</td>
<td>FINANCIAL STATEMENT ANALYSIS</td>
</tr>
</tbody>
</table>

FIN 443 PORTFOLIO MANAGEMENT
FIN 444 FINANCIAL RISK MANAGEMENT
FIN 445 INTERNATIONAL FINANCIAL MANAGEMENT
FIN 499 SELECTED TOPICS IN FINANCE

Corporate Finance Specialization (12 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 342</td>
<td>ADVANCED FINANCIAL MANAGEMENT</td>
</tr>
</tbody>
</table>

Investments Specialization (12 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>FIN 341</td>
<td>INVESTMENTS</td>
</tr>
<tr>
<td>FIN 443</td>
<td>PORTFOLIO MANAGEMENT</td>
</tr>
<tr>
<td>FIN 440</td>
<td>FIXED INCOME SECURITIES</td>
</tr>
<tr>
<td>or FIN 442</td>
<td>FINANCIAL RISK MANAGEMENT</td>
</tr>
<tr>
<td>or FIN 444</td>
<td>FINANCIAL STATEMENT ANALYSIS</td>
</tr>
<tr>
<td>or FIN 445</td>
<td>INTERNATIONAL FINANCIAL MANAGEMENT</td>
</tr>
</tbody>
</table>

Total Hours 28-32

* Baccalaureate Core Course (BCC)

Minor Code: 813

Finance Undergraduate Major (BA, BS, HBA, HBS)

The goal of the finance program at OSU is to prepare students for careers
in institutional finance, which includes careers in banking, brokerage,
insurance and other fields.

Individuals entering a career with a financial institution have many
opportunities open to them. Many who go into banking select career
paths in either operations or lending. Within the lending area, finance
majors can specialize in installment credit lending to consumers of
durable goods, mortgage lending to home builders and buyers, or
commercial lending to help finance the growth of businesses.

Men and women entering the securities industry find careers as stock
and bond brokers, security analysts or portfolio managers. Individuals
choosing the area of insurance typically enter company operations
through either claims or underwriting positions. Those with sales
positions can choose to work either with corporations or individuals as
a client base. In addition, many decide to work for the government as
finance personnel in charge of revenue and expenditure programs.

Financial managers engage in many activities designed to ensure the
efficient use of an individual's or organization's capital resources. The
finance field involves the management of funds in our economic system.
Because financial managers deal with other people's money, finance is
a career choice for individuals who enjoy working with people and who
desire challenging assignments.

The BS/BA in finance has been accepted into the Chartered
Financial Analyst® (CFA) Institute University Recognition Program
(http://www.cfainstitute.org/community/university/University/ recognition_program_for_universities.aspx). This status is granted to
institutions whose degree program or programs incorporate at least 70
percent of the CFA Program Candidate Body of Knowledge (CBOK), which
provides students with a solid grounding in the CBOK and positions them
well for the CFA exams.
Finance major requirements are divided into two parts – lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division finance and business curricula. The lower-division business core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

### Finance Program Requirements (180)

#### Finance Curriculum (36)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 378</td>
<td>ACCOUNTING INFORMATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 240</td>
<td>FINANCE (C or better required)</td>
<td>4</td>
</tr>
<tr>
<td>or BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>FIN 341</td>
<td>INVESTMENTS</td>
<td>4</td>
</tr>
<tr>
<td>FIN 342</td>
<td>ADVANCED FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>FIN 445</td>
<td>INTERNATIONAL FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Finance Electives

Select three of the following: 12

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 441</td>
<td>FINANCIAL INSTITUTIONS</td>
</tr>
<tr>
<td>FIN 442</td>
<td>FINANCIAL STATEMENT ANALYSIS</td>
</tr>
<tr>
<td>FIN 443</td>
<td>PORTFOLIO MANAGEMENT</td>
</tr>
<tr>
<td>FIN 444</td>
<td>FINANCIAL RISK MANAGEMENT</td>
</tr>
<tr>
<td>FIN 499</td>
<td>SELECTED TOPICS IN FINANCE</td>
</tr>
</tbody>
</table>

#### Finance-Specific Electives

Select one of the following: 4

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 317</td>
<td>EXTERNAL REPORTING I</td>
</tr>
<tr>
<td>ECON 330</td>
<td>MONEY AND BANKING</td>
</tr>
<tr>
<td>ECON 340</td>
<td>INTERNATIONAL ECONOMICS</td>
</tr>
</tbody>
</table>

Total Hours 36

### Business Administration Core Curriculum (78–81)

The business administration core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate course work and further develop decision-making skills through the analysis of business cases.

#### Summary of Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Division</td>
<td>66-69</td>
</tr>
<tr>
<td></td>
<td>Business Core Courses (44-47)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finance Course (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Math, Economics, Writing and Communications (18)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Upper Division</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Business Core Courses (34)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finance Courses (36)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>University General Education Requirements</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Unrestricted Electives</td>
<td>4-7</td>
</tr>
<tr>
<td></td>
<td>Total credits required for graduation</td>
<td>180</td>
</tr>
</tbody>
</table>

1. 10 credits from lower-division course work satisfy University General Education Requirements

### Finance Major

#### Course Title Hours

**First Year**

Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the finance major from another college or university, will complete the following three-course sequence during their first year:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td>6</td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION-AWARENESS TO ACTION</td>
<td>6</td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION-IDEAS TO REALITY</td>
<td>6</td>
</tr>
</tbody>
</table>

All other students will complete the following course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 101</td>
<td>BUSINESS NOW</td>
<td>6</td>
</tr>
</tbody>
</table>

All students should also complete:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>or WR 323</td>
<td>*ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
<td></td>
</tr>
</tbody>
</table>

#### Baccalaureate core, unrestricted electives 29-32

**Second Year**

All students should complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS (Transfer students only)</td>
<td>3</td>
</tr>
<tr>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
<td>1</td>
</tr>
<tr>
<td>BA 284</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III</td>
<td>1</td>
</tr>
</tbody>
</table>

Students who transfer from another college or university into the finance major who have completed all lower-division business core course work should complete the following course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 381</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
</tbody>
</table>

All second-year students should also complete:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Hours</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>or BA 290</td>
<td>or MARKETING</td>
<td></td>
</tr>
<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td>4</td>
</tr>
<tr>
<td>or BA 260</td>
<td>or INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 240</td>
<td>FINANCE</td>
<td>4</td>
</tr>
<tr>
<td>or BA 275</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Hours** 46

**Third Year**

**Finance-Specific**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 378</td>
<td>ACCOUNTING INFORMATION MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>FIN 341</td>
<td>INVESTMENTS</td>
<td>4</td>
</tr>
<tr>
<td>FIN 342</td>
<td>ADVANCED FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Finance-Specific Electives—Select one of the following courses:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTG 317</td>
<td>EXTERNAL REPORTING I</td>
<td>4</td>
</tr>
<tr>
<td>ECON 330</td>
<td>MONEY AND BANKING</td>
<td>4</td>
</tr>
<tr>
<td>ECON 340</td>
<td>INTERNATIONAL ECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Business Core**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 311</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>BA 312</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II</td>
<td>1</td>
</tr>
<tr>
<td>BA 313</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III</td>
<td>1</td>
</tr>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td>4</td>
</tr>
<tr>
<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
<td>4</td>
</tr>
<tr>
<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 375</td>
<td>APPLIED QUANTITATIVE METHODS</td>
<td>4</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>or WR 322</td>
<td>or *ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>or WR 327</td>
<td>or *TECHNICAL WRITING</td>
<td></td>
</tr>
</tbody>
</table>

**Baccalaureate core, minor, option or unrestricted electives** 3

**Hours** 53

**Fourth Year**

**Finance-Specific**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 445</td>
<td>INTERNATIONAL FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Finance Electives—Select three of the following courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 441</td>
<td>FINANCIAL INSTITUTIONS</td>
<td>4</td>
</tr>
<tr>
<td>FIN 442</td>
<td>FINANCIAL STATEMENT ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>FIN 443</td>
<td>PORTFOLIO MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>FIN 444</td>
<td>FINANCIAL RISK MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Business Core**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 411</td>
<td>FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT</td>
<td>1</td>
</tr>
<tr>
<td>BA 412</td>
<td>THE DESIGN THINKING CHALLENGE</td>
<td>1</td>
</tr>
<tr>
<td>BA 413</td>
<td>FINANCIAL PLANNING II</td>
<td>1</td>
</tr>
<tr>
<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
<td>4</td>
</tr>
</tbody>
</table>

**Baccalaureate core, minor or unrestricted electives** 21-23

**Hours** 48-50

**Total Hours** 189-194

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Major Code: 182**
Dean's Academy Option

Winter
BA 312  THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II  1
BA 352  MANAGING INDIVIDUAL AND TEAM PERFORMANCE  4
BA 354  ^MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY  4
BA 357  OPERATIONS MANAGEMENT  4
FIN 342  ADVANCED FINANCIAL MANAGEMENT  4

Hours  17

Spring
ACTG 378  ACCOUNTING INFORMATION MANAGEMENT  4
BA 313  THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III  1
BA 347  INTERNATIONAL BUSINESS  4
FIN 341  INVESTMENTS  4

Hours  13

Fourth Year
Fall
BA 411  FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I  1
Finance Elective  4-8
Bacc Core-STS  3
Electives  4-8

Hours  12-20

Winter
BA 412  THE DESIGN THINKING CHALLENGE  1
Finance Elective  4-8
Electives  6-10

Hours  11-19

Spring
BA 413  FINANCIAL PLANNING II  1
BA 466  INTEGRATIVE STRATEGIC EXPERIENCE  4
FIN 445  INTERNATIONAL FINANCIAL MANAGEMENT  4
Electives  5

Hours  14

Total Hours  172-188

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Dean's Academy Option

This option is offered within the following major(s):
- Accountancy - College of Business
- Apparel Design - College of Business
- Business Administration - College of Business
- Business Analytics - College of Business
- Business Information Systems - College of Business
- Design and Innovation Management - College of Business
- Finance - College of Business
- Interior Design - College of Business
- Management - College of Business
- Marketing - College of Business
- Merchandising Management - College of Business

The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean's Academy Option provides students with:
- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean's Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design course work that have been designated as honors sections (i.e., the course has an “H” designation such as BA 160H). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean's Academy option requirements.

Option Code: 754

International Business Option

This option is offered within the following major(s):
- Accountancy - College of Business
- Business Administration - College of Business
- Business Information Systems - College of Business
- Finance - College of Business
- Management - College of Business
- Marketing - College of Business

The International Business option prepares students for positions in organizations engaged in international trade. Students study the economic, political, geographical, and socio-cultural factors that impact business across national boundaries. Areas of greatest opportunity for overseas assignments are with service organizations such as banks, consulting firms and accounting firms; with import/export firms; with governmental organizations; and in marketing and financial management areas of multinational firms. A career in international business can lead to exciting and rewarding opportunities abroad.

Most multinational business firms, however, hire new employees first for domestic assignments in order to provide them with a thorough knowledge of the firm, its products, and its policies, or for specific assignments in one of the functional areas of the business, before providing overseas opportunities.

Because the majority of employees who eventually hold high-level positions in an international business start in entry-level positions within business areas, all international business students must also complete requirements for a primary discipline within a business. These disciplines include the majors in accountancy, business administration, entrepreneurship, general business, and hospitality management.
options), business information systems, finance, management and marketing.

Students earn this option with a minimum of one quarter term of study abroad through an international exchange or study abroad program approved by the College of Business. Students must complete a minimum of 18 quarter credits in business or business-related course work. The successfully completed course work must articulate back to OSU as courses that extend the knowledge and skills attained within the business core (that is, they cannot be used as a direct substitute for a business core course). Within the Arthur Stonehill International Business Exchange program offered through the College of Business, all courses offered by the partner schools are taught in English.

**Option Code: 190**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>BA 349</td>
<td>IMPACT OF CULTURE ON BUSINESS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Select a minimum of 18 credits of business or business related course work</td>
<td>18</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

1 Completed on an approved international exchange or study abroad program

Students must earn this option with one term of study abroad through an approved College of Business international exchange. Courses in these programs are taught in English.

**Financial Planning Graduate Certificate**

**Also available via Ecampus.**

This graduate certificate is designed to help prepare students with an undergraduate degree for careers in financial planning and wealth management. The curriculum includes coursework required by the CFP Board.

**Certificate Code: CG16**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 540</td>
<td>CORPORATE FINANCE</td>
<td>3</td>
</tr>
<tr>
<td>FIN 542</td>
<td>INVESTMENTS</td>
<td>3</td>
</tr>
<tr>
<td>FIN 550</td>
<td>FUNDAMENTALS OF FINANCIAL PLANNING</td>
<td>4</td>
</tr>
<tr>
<td>or FIN 551</td>
<td>INSURANCE PLANNING AND TAX PLANNING</td>
<td></td>
</tr>
<tr>
<td>FIN 552</td>
<td>FINANCIAL PLANNING II</td>
<td>3</td>
</tr>
<tr>
<td>FIN 553</td>
<td>FINANCIAL PLANNING III</td>
<td>6</td>
</tr>
<tr>
<td>MRKT 588</td>
<td>PERSONAL SELLING</td>
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</tr>
<tr>
<td>Total Hours</td>
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<td>23</td>
</tr>
</tbody>
</table>

**Hospitality Management Undergraduate Major (BA, BS, HBA, HBS)**

Available only at OSU-Cascades.

The undergraduate curriculum in hospitality management provides students with the knowledge necessary to become leaders, executives and owners in the hospitality industry. The course work provides students with skills in service, operations management, hospitality technology, food and beverage operations as well as basic business fundamentals in marketing and accounting.

**Major Code: 291**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
</tr>
<tr>
<td>Speech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>Writing I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>Writing II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Biological Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Select one or two Biological Science or Physical Science courses</td>
<td>4-5</td>
<td></td>
</tr>
<tr>
<td>Cultural Diversity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
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<td>3-4</td>
</tr>
<tr>
<td>Literature and the Arts</td>
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<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Physical Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>4-5</td>
</tr>
<tr>
<td>Social Processes and Institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td></td>
</tr>
<tr>
<td>Western Culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Difference, Power and Discrimination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Contemporary Global Issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUS 350</td>
<td>*SUSTAINABLE COMMUNITIES</td>
<td></td>
</tr>
<tr>
<td>Science, Technology and Society</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Hospitality Core Classes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HM 101</td>
<td>INTRODUCTION TO HOSPITALITY</td>
<td>4</td>
</tr>
</tbody>
</table>
Major Code: 851

A College of Business GPA of 2.50 (OSU grades only) and a minimum grade of C– or above is required in all completed BA course work that is relevant to the degree program. Students may not S/U courses in this major.

**Code** | **Title** | **Hours**
--- | --- | ---
BA 215 | FUNDAMENTALS OF ACCOUNTING | 4
BA 230 | BUSINESS LAW I | 4
BA 260 | INTRODUCTION TO ENTREPRENEURSHIP | 4
BA 314 | SUSTAINABLE BUSINESS OPERATIONS | 4
BA 352 | MANAGING INDIVIDUAL AND TEAM PERFORMANCE | 4
or BA 351 | MANAGING ORGANIZATIONS | 4
BA 360 | INTRODUCTION TO FINANCIAL MANAGEMENT | 4
BA 390 | MARKETING | 4
ECON 201 | *INTRODUCTION TO MICROECONOMICS (Credits applied in Bacc Core section above) | 4

**Hospitality Electives**

Select 12 credits of the following:

- HM 210 HOSPITALITY INTERNSHIP 3
- HM 230 LODGING MANAGEMENT 4
- HM 235 HOSPITALITY LAW AND LABOR RELATIONS 4
- HM 310 INTERNSHIP II 3
- HM 320 SERVICE AUTOMATION AND TECHNOLOGY 4
- HM 321 HOSPITALITY TECHNOLOGY LABORATORY 4
- HM 410 HOSPITALITY INTERNSHIP III 3
- HM 420 REVENUE MANAGEMENT AND PRICING 4
- HM 430 SERVICE MANAGEMENT 4
- HM 470 *ADVANCED HOSPITALITY 4
- MTH 245 *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES 4

**Business Core (Business and Entrepreneurship Minor)**

BA 215 | FUNDAMENTALS OF ACCOUNTING | 4
BA 230 | BUSINESS LAW I | 4
BA 260 | INTRODUCTION TO ENTREPRENEURSHIP | 4
BA 314 | SUSTAINABLE BUSINESS OPERATIONS | 4
BA 352 | MANAGING INDIVIDUAL AND TEAM PERFORMANCE | 4
or BA 351 | MANAGING ORGANIZATIONS | 4
BA 360 | INTRODUCTION TO FINANCIAL MANAGEMENT | 4
BA 390 | MARKETING | 4
ECON 201 | *INTRODUCTION TO MICROECONOMICS (Credits applied in Bacc Core section above) | 4

**Innovation Management Undergraduate Major (BA, BS, HBA, HBS)**

The Innovation Management major is a **double-degree program**. It can only be added to a primary OSU non-business major. See Academic Regulation 26a (https://catalog.oregonstate.edu/regulations/).

Graduates of the IMDD program will gain expertise in developing new ideas and inventions and learn how to take these ideas through the innovation and commercialization process. The intent is to build upon the “technical” skills developed by students in their primary major while giving them the tools to become more productive and innovative members of the organizations where they will work. It will provide students with a foundation in business basics, such as marketing and accounting, while also building students’ expertise in the innovation and commercialization process.

This major is limited to 45 qualified students per year. Interested students should consult with the College of Business Advising Office, Austin Hall 122, 541-737-3716, for more detail about the declaration requirements and process.

**Major Code: 291**

**Innovation Management Undergraduate Major (BA, BS, HBA, HBS)**

The Innovation Management major is a **double-degree program**. It can only be added to a primary OSU non-business major. See Academic Regulation 26a (https://catalog.oregonstate.edu/regulations/).

Graduates of the IMDD program will gain expertise in developing new ideas and inventions and learn how to take these ideas through the innovation and commercialization process. The intent is to build upon the “technical” skills developed by students in their primary major while giving them the tools to become more productive and innovative members of the organizations where they will work. It will provide students with a foundation in business basics, such as marketing and accounting, while also building students’ expertise in the innovation and commercialization process.

This major is limited to 45 qualified students per year. Interested students should consult with the College of Business Advising Office, Austin Hall 122, 541-737-3716, for more detail about the declaration requirements and process.

**Major Code: 851**

**Interior Design Undergraduate Major (BS, HBS)**

The Interior Design option offers students the opportunity to focus on commercial design with an emphasis on space planning, heating and lighting plans, and interior construction specifications.

The Interior Design major is a professional program (major code 458) offered through the College of Business. Entering students are designated as Pre-Interior Design majors (major code 454). The lower-division pre-design program requires completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division design curricula. These courses must be completed before the student is eligible for admission to the upper-division studio-based curricula. The lower-division pre-design core coursework may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.
Admission to the upper-division studio-based Interior Design major is competitive and is restricted to those students who have demonstrated an ability to achieve the high standards required for professional studies. Enrollment may be limited to the number of students who can be served by the faculty and facilities. To apply and be considered for admission, students must meet the following requirements:

* Be declared as a Pre-Interior Design major.
* Have a minimum OSU cumulative GPA of 2.5, and a minimum cumulative GPA of 2.5 in all lower-division pre-Interior Design courses.
* Have completed and received a C– or better in ALL courses within the lower-division pre-design core by the end of spring term before applying.

Students who have completed their lower-division design courses at a college or university other than OSU must be admitted to the pre-Interior design major their first term and apply to the Interior design major during the normal selection process (typically at the end of spring term each year). Admission into the Interior design major requires completion of DSGN 287 and submission of a portfolio. The portfolio will expect students to submit work that demonstrates competency in fundamental design skills and concepts.

The following courses are recommended for students who need to further develop those design skills:

**ART 115 2-D CORE STUDIO**
**ART 117 3-D CORE STUDIO**

**Major Code: 458**

**Pre-Interior Design Major Code: 454**

Interior Design major requirements are divided into two parts. The first part (the pre-design major), usually taken in the first two years, must be completed before formal admission into the major. The second part (Professional School) is usually taken in the last two years after formal admission into the Interior Design major.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary of Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Major</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Pre-Design Core Classes (34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSGN 287</td>
<td>STUDIO I: DESIGN COMMUNICATION</td>
<td>1</td>
</tr>
<tr>
<td>Art, Communications, Economics, Math, Statistics, and Writing (24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional School</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Professional Design Core Classes (35)</td>
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<td></td>
</tr>
<tr>
<td>Interior Design Courses (27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University General Education Requirements</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Unrestricted Electives</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td><strong>Total credits needed for graduation</strong></td>
<td><strong>180</strong></td>
<td></td>
</tr>
</tbody>
</table>

1. 21 credits from pre-design major satisfy University General Education Requirements
2. 3 credits from design major satisfy University General Education Requirements

**Course** | **Title** | **Hours** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art</strong></td>
<td><strong>9</strong></td>
<td></td>
</tr>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td></td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
<td></td>
</tr>
<tr>
<td>or ART 205</td>
<td>*INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE</td>
<td></td>
</tr>
<tr>
<td>or ART 204</td>
<td>*INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td></td>
</tr>
<tr>
<td>ART 367</td>
<td>*HISTORY OF DESIGN</td>
<td></td>
</tr>
</tbody>
</table>

**Written and Oral Communication** | **6** |
| COMM 111 | *PUBLIC SPEAKING | |
| or COMM 114 | *ARGUMENT AND CRITICAL DISCOURSE | |
| or COMM 218 | *INTERPERSONAL COMMUNICATION | |
| WR 222 | *ENGLISH COMPOSITION | |
| or WR 323 | *ENGLISH COMPOSITION | |
| or WR 327 | *TECHNICAL WRITING | |

**University General Requirements** | **24** |
| The ART, COMM, ECON, MTH, and WR classes above meet the university’s baccalaureate core requirements for Mathematics, Social Processes and Institutions, Writing II, Speech, Western Culture, Literature and Arts, and Science, Technology and Society. All students must meet the other baccalaureate core requirements and the other requirements for baccalaureate degrees. (See Earning a Degree at OSU) |

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unrestricted Electives</strong></td>
<td><strong>32</strong></td>
<td></td>
</tr>
<tr>
<td>Students are provided elective credits to enable them to achieve a degree of specialization and depth to match their interests</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total credits required for graduation</strong></td>
<td><strong>180</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Interior Design Major**

**Course** | **Title** | **Hours** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Interior Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students will complete the following three-course sequence during their first year:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td></td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION--AWARENESS TO ACTION</td>
<td></td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION--IDEAS TO REALITY</td>
<td></td>
</tr>
<tr>
<td>All other students will complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 101</td>
<td>BUSINESS NOW</td>
<td></td>
</tr>
<tr>
<td>All students should also complete:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td></td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>DSGN 121</td>
<td>COMPUTER AIDED DESIGN</td>
<td></td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td></td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>General Baccalaureate Core courses</td>
<td><strong>20-22</strong></td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td><strong>42-45</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Second Year**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students should complete the following courses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS (transfer students only)</td>
<td></td>
</tr>
<tr>
<td>DSGN 253</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>DSGN 282</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I</td>
<td></td>
</tr>
<tr>
<td>DSGN 283</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II</td>
<td></td>
</tr>
<tr>
<td>DSGN 284</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III</td>
<td></td>
</tr>
<tr>
<td>Students who transfer from another college or university into the pre-interior design major who have completed all lower-division design core coursework should complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 381</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>All second-year students should also complete:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Design Core Curriculum** | **72** |
| The design core curriculum provides students with a broad overview of design thinking and processes |
**Mathematics and Statistics** | **8** |
| MTH 111 | *COLLEGE ALGEBRA | |
| ST 201 | PRINCIPLES OF STATISTICS | |
**Economics** | **4** |
| ECON 201 | *INTRODUCTION TO MICROECONOMICS | |
ART 206 or ART 205 or ART 204 *INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY or *INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE or *INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES

BA 260 INTRODUCTION TO ENTREPRENEURSHIP 4
DSGN 244 COLOR INNOVATION 4
DSGN 255 TEXTILES 4
DSGN 281 DRAWING AND SKETCHING 4
DSGN 287 STUDIO I: DESIGN COMMUNICATION 4
ECON 201 *INTRODUCTION TO MICROECONOMICS 4
ST 201 PRINCIPLES OF STATISTICS 4

WR 222 *ENGLISH COMPOSITION 3 or WR 323 or WR 327 or *TECHNICAL WRITING

Baccalaureate core, minor courses, or unrestricted electives 5-7

**Third Year**

**Professional Interior Design**

ART 367 *HISTORY OF DESIGN 3
BA 315 ACCOUNTING FOR DECISION MAKING 4
BA 352 MANAGING INDIVIDUAL AND TEAM PERFORMANCE 4
BA 354 *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY 4
BA 390 MARKETING 4
or BA 223 or PRINCIPLES OF MARKETING

DSGN 311 THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP I 1
DSGN 312 THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II 1
DSGN 313 THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III 1
DSGN 341 DESIGN THINKING AND PROCESS INNOVATION 4
DSGN 383 BUILDING CONSTRUCTION AND MATERIALS 3
DSGN 387 STUDIO III: ADVANCED DESIGN COMMUNICATION 4
DSGN 388 STUDIO IV: HOSPITALITY DESIGN 4
DSGN 394 STUDIO V: LIGHTING DESIGN 4
MOMT 364 PROJECT MANAGEMENT 4

Hours 45

**Fourth Year**

DSGN 411 FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT 1
DSGN 412 FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT II 1
DSGN 413 FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT III 1
DSGN 464 CONTEMPORARY HISTORY OF INTERIORS AND HOUSING 3
DSGN 488 STUDIO VI: HEALTHCARE DESIGN 4
DSGN 495 STUDIO VII: SENIOR THESIS II 4
MRKT 492 CONSUMER BEHAVIOR 4
MRKT 495 RETAIL MANAGEMENT 4

Baccalaureate core, minor courses, or unrestricted electives 22

Hours 44

Total Hours 182-187

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)
* Students entering design programs should have basic art and illustration skills. ART 115 (https://catalog.oregonstate.edu/search/?P=ART%20115/) and ART 117 (https://catalog.oregonstate.edu/search/?P=ART%20117/) are highly recommended elective courses

Major Code: 458

Pre-Interior Design Major Code: 454

**Dean's Academy Option**

This option is offered within the following major(s):
- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
- Business Information Systems - College of Business (p. 257)
- Design and Innovation Management - College of Business (p. 261)
- Finance - College of Business (p. 265)
- Interior Design - College of Business (p. 270)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)
- Merchandising Management - College of Business (p. 281)

The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean's Academy Option provides students with:
- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean’s Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design coursework that have been designated as honors sections (i.e., the course has an "H" designation such as BA 160H). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean’s Academy option requirements.

Option Code: 754

**Management Undergraduate Major (BA, BS, HBA, HBS)**

The management curriculum helps prepare students for careers as managers and supervisors in goods-producing and service enterprises. Students obtain a solid grounding in the management of systems, personnel, and quality. The integrative focus of the program also provides
excellent preparation for graduate-level studies in law, urban and regional planning, public services administration, and health care administration.

Management is the process of planning, organizing, leading and controlling all that encompasses human, material and financial resources in an organizational environment. A management degree means that you have learned the concepts of getting things done through others within organizations.

Major Code: 196

Management major requirements are divided into two parts – lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division finance and business curricula. The lower-division business core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Division</td>
<td>Business Core Courses (44-47)</td>
<td>62-65</td>
</tr>
<tr>
<td>Lower Division</td>
<td>Math, Economics, Writing and Communications (18)</td>
<td>1</td>
</tr>
<tr>
<td>Upper Division</td>
<td>Business Core Courses (34)</td>
<td>66</td>
</tr>
<tr>
<td>Upper Division</td>
<td>Management Courses (32)</td>
<td>40</td>
</tr>
<tr>
<td>Unrestricted Electives</td>
<td>9-12</td>
<td></td>
</tr>
<tr>
<td>Total credits required for graduation</td>
<td>180</td>
<td></td>
</tr>
</tbody>
</table>

Management Program Requirements (180)

Management Curriculum (32)

Management students must complete 32 credits: 24 credits in required courses, 4 credits in an elective management course, and 4 credits of experiential learning.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td>MGMT 264</td>
<td>PROJECT MANAGEMENT</td>
</tr>
<tr>
<td>Required Courses</td>
<td>MGMT 446</td>
<td>CROSS-CULTURAL MANAGEMENT</td>
</tr>
<tr>
<td>or MGMT 448</td>
<td>EMPLOYEE RECRUITMENT AND SELECTION</td>
<td>4</td>
</tr>
<tr>
<td>Required Courses</td>
<td>MGMT 452</td>
<td>LEADERSHIP</td>
</tr>
<tr>
<td>Required Courses</td>
<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
</tr>
<tr>
<td>Required Courses</td>
<td>MGMT 455</td>
<td>INFLUENCE AND NEGOTIATION</td>
</tr>
<tr>
<td>Required Courses</td>
<td>MGMT 457</td>
<td>SUPPLY CHAIN STRATEGY</td>
</tr>
<tr>
<td>Electives</td>
<td>Select one of the following:</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>BA 362</td>
<td>SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES</td>
</tr>
<tr>
<td>Electives</td>
<td>BA 363</td>
<td>TECHNOLOGY AND INNOVATION MANAGEMENT</td>
</tr>
<tr>
<td>Electives</td>
<td>BA 365</td>
<td>FAMILY BUSINESS MANAGEMENT</td>
</tr>
<tr>
<td>Electives</td>
<td>BA 432</td>
<td>*ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS</td>
</tr>
<tr>
<td>Electives</td>
<td>BA 447</td>
<td>TOPICS IN INTERNATIONAL BUSINESS</td>
</tr>
<tr>
<td>Electives</td>
<td>BA 460</td>
<td>VENTURE MANAGEMENT</td>
</tr>
<tr>
<td>Electives</td>
<td>MGMT 449</td>
<td>COMPENSATION MANAGEMENT</td>
</tr>
<tr>
<td>Experiential Learning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Experiential Learning should be aligned with the career goals of the student. Select one of the following experiential activities:

- Professional internship: Complete BA 410 with minimum of 4 credits
- Research project: Complete BA 403 or BA 405; or BA 407 with minimum of 4 credits
- International experience: Complete an international study abroad or exchange that transfers a minimum of 4 academic credits to OSU.
- Mentoring: Complete the Introduction to Mentoring and Coaching Seminar series (minimum of 4 credits). This series requires participation in mentor activities.
- Experiential learning/entrepreneurship (solving specific problems of local businesses or non-profit organizations): Complete BA 406 with a minimum of 4 credits.

Business Administration Core Curriculum (78–81)

The business administration core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate course work and further develop decision-making skills through the analysis of business cases.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
</tr>
<tr>
<td>Economics</td>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
</tr>
<tr>
<td>or ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>Written and Oral Communication</td>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td>4</td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td>4</td>
</tr>
<tr>
<td>or WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>4</td>
</tr>
<tr>
<td>or WR 323</td>
<td>*ENGLISH COMPOSITION</td>
<td>4</td>
</tr>
<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
<td>4</td>
</tr>
<tr>
<td>University General Requirements</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Unrestricted Electives</td>
<td>11-16</td>
<td></td>
</tr>
</tbody>
</table>

10 credits from lower-division course work satisfy University General Education Requirements

- MTH 241; ECON 201 and ECON 202; WR 222, WR 323 or WR 327, and COMM 111, COMM 114 or COMM 218 meet the university’s Baccalaureate Core requirements for mathematics, social processes and institutions, writing II, and speech, respectively. All students must meet the other Baccalaureate Core requirements and the other requirements for baccalaureate degrees. (See Requirements for Baccalaureate Degrees.)
Management Major

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the management major from another college or university, will complete the following three-course sequence during their first year:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td></td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION—AWARENESS TO ACTION</td>
<td></td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION—IDEAS TO REALITY</td>
<td></td>
</tr>
<tr>
<td>All other students will complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 101</td>
<td>BUSINESS NOW</td>
<td>6</td>
</tr>
<tr>
<td>All students should also complete*:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>Baccalaureate core, unrestricted electives</td>
<td>30-32</td>
<td></td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All students should complete the following courses*:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS</td>
<td>2</td>
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<tr>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
<td>1</td>
</tr>
<tr>
<td>BA 284</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III</td>
<td>1</td>
</tr>
<tr>
<td>*Students who transfer from another college or university into the management major who have completed all lower-division business core course work should complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 381</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>All second-year students should also complete:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>or BA 390</td>
<td>MARKETING</td>
<td></td>
</tr>
<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td>4</td>
</tr>
<tr>
<td>BA 240</td>
<td>FINANCE</td>
<td>4</td>
</tr>
<tr>
<td>or BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
</tr>
<tr>
<td>BA 270</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 276</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 311</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP</td>
<td>1</td>
</tr>
<tr>
<td>DEVELOPMENT I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 312</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP</td>
<td>1</td>
</tr>
<tr>
<td>DEVELOPMENT II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 313</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP</td>
<td>1</td>
</tr>
<tr>
<td>DEVELOPMENT III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td>4</td>
</tr>
<tr>
<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
<td>4</td>
</tr>
<tr>
<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 375</td>
<td>APPLIED QUANTITATIVE METHODS</td>
<td>4</td>
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<tr>
<td>MGMT 364</td>
<td>PROJECT MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>or WR 322</td>
<td>*ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>or WR 327</td>
<td>*TECHNICAL WRITING</td>
<td></td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 411</td>
<td>FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP</td>
<td>1</td>
</tr>
<tr>
<td>DEVELOPMENT I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 412</td>
<td>THE DESIGN THINKING CHALLENGE</td>
<td>1</td>
</tr>
<tr>
<td>BA 413</td>
<td>FINANCIAL PLANNING II</td>
<td>1</td>
</tr>
<tr>
<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 446</td>
<td>CROSS-CULTURAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>or MGMT 448</td>
<td>EMPLOYEE RECRUITMENT AND SELECTION</td>
<td></td>
</tr>
<tr>
<td>MGMT 452</td>
<td>LEADERSHIP</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 455</td>
<td>INFLUENCE AND NEGOTIATION</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 457</td>
<td>SUPPLY CHAIN STRATEGY</td>
<td>4</td>
</tr>
<tr>
<td>Management Elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Management Experiential Learning</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Baccalaureate core, minor, option or unrestricted electives</td>
<td>9</td>
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</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td>44</td>
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</tr>
</tbody>
</table>

Sample Four-Year Plan: Management

### Baccalaureate Core Course (BCC)

### Writing Intensive Course (WIC)

**Major Code: 196**

### Course Title Hours

#### First Year

**Fall**

- BA 160 B-ENGAGED
- BC Science
- WR 121 *ENGLISH COMPOSITION (Alpha coded)
- Math through MTH 241
- Fitness, Speech, CD, DPD Electives

**Hours**

45

**Fourth Year**

- BA 411 FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I
- BA 412 THE DESIGN THINKING CHALLENGE
- BA 413 FINANCIAL PLANNING II
- BA 466 INTEGRATIVE STRATEGIC EXPERIENCE
- MGMT 446 CROSS-CULTURAL MANAGEMENT
- MGMT 448 or MGMT 448 EMPLOYEE RECRUITMENT AND SELECTION
- MGMT 452 LEADERSHIP
- MGMT 453 HUMAN RESOURCES MANAGEMENT
- MGMT 455 INFLUENCE AND NEGOTIATION
- MGMT 457 SUPPLY CHAIN STRATEGY

**Management Elective**

4

**Management Experiential Learning**

4

**Baccalaureate core, minor, option or unrestricted electives**

9

**Total Hours**

180-182

#### Second Year

**Fall**

- BA 230 BUSINESS LAW I
- BA 250 INTRODUCTION TO ENTREPRENEURSHIP
- BA 281 PROFESSIONAL DEVELOPMENT
- BA 282 PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I

**Electives**

3

**Hours**

15

**Spring**

- BA 311 *ENGLISH COMPOSITION (Alpha coded)
- Math through MTH 241
- Fitness, Speech, CD, DPD Electives

**Second Year**

**Fall**

- BA 311 INNOVATION NATION—IDEAS TO REALITY
- BC Science
- WR 121 *ENGLISH COMPOSITION (Alpha coded)
- Math through MTH 241
- Fitness, Speech, CD, DPD Electives

**Hours**

15
Dean's Academy Option

This option is offered within the following major(s):

• Accountancy - College of Business (p. 232)
• Apparel Design - College of Business (p. 237)
• Business Administration - College of Business (p. 246)
• Business Analytics - College of Business (p. 252)
• Business Information Systems - College of Business (p. 257)
• Design and Innovation Management - College of Business (p. 261)
• Finance - College of Business (p. 265)
• Interior Design - College of Business (p. 270)
• Management - College of Business (p. 272)
• Marketing - College of Business (p. 276)
• Merchandising Management - College of Business (p. 281)

The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean's Academy Option provides students with:

• A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
• Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
• Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
• Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean's Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design course work that have been designated as honors sections (i.e., the course has an "H" designation such as BA 160H (https://catalog.oregonstate.edu/search/?P=BA%20160H/)). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean's Academy Option requirements.

Option Code: 754

International Business Option

This option is offered within the following major(s):

• Accountancy - College of Business (p. 232)
• Business Administration - College of Business (p. 246)
• Business Information Systems - College of Business (p. 257)
• Finance - College of Business (p. 265)
• Management - College of Business (p. 272)
• Marketing - College of Business (p. 276)
The International Business option prepares students for positions in organizations engaged in international trade. Students study the economic, political, geographical, and socio-cultural factors that impact business across national boundaries. Areas of greatest opportunity for overseas assignments are with service organizations such as banks, consulting firms and accounting firms; with import/export firms; with governmental organizations; and in marketing and financial management areas of multinational firms. A career in international business can lead to exciting and rewarding opportunities abroad. Most multinational business firms, however, hire new employees first for domestic assignments in order to provide them with a thorough knowledge of the firm, its products, and its policies, or for specific assignments in one of the functional areas of the business, before providing overseas opportunities.

Because the majority of employees who eventually hold high-level positions in an international business start in entry-level positions within business areas, all international business students must also complete requirements for a primary discipline within a business. These disciplines include the majors in accountancy, business administration (Entrepreneurship, General Business, and Hospitality Management options), business information systems, finance, management and marketing.

Students earn this option with a minimum of one quarter term of study abroad through an international exchange or study abroad program approved by the College of Business. Students must complete a minimum of 18 quarter credits in business or business-related course work. The successfully completed course work must articulate back to OSU as courses that extend the knowledge and skills attained within the business core (that is, they cannot be used as a direct substitute for a business core course). Within the Arthur Stonehill International Business Exchange program offered through the College of Business, all courses offered by the partner schools are taught in English.

Option Code: 190

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>BA 349</td>
<td>IMPACT OF CULTURE ON BUSINESS</td>
<td>1</td>
</tr>
</tbody>
</table>

Select a minimum of 18 credits of business or business related course work

Total Hours 24

1 Completed on an approved international exchange or study abroad program

The Marketing minor provides students with marketing skills and leadership training. Opportunities exist for individuals with marketing skills in a wide variety of positions and career options, including advertising and communications, brand management, market research, sales, retail management, purchasing management and more.

Marketing is the process of "creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large" (American Marketing Association). Marketing consists of a sequence of activities: identifying customer needs, developing goods and services to satisfy those needs, communicating information about products, services, or ideas to potential customers, and distributing to products customers.

Option Code: 190

Marketing Minor

The Marketing minor provides students with marketing skills and leadership training. Opportunities exist for individuals with marketing skills in a wide variety of positions and career options, including advertising and communications, brand management, market research, sales, retail management, purchasing management and more.

The Marketing curriculum provides students with technical marketing skills and leadership training. Opportunities exist for marketing graduates in a wide variety of organizations, including manufacturing firms, service firms, retailers, wholesalers, advertising agencies, the communications media and government agencies. Career options (http://business.oregonstate.edu/marketing/marketing-career-options/) include sales, advertising, retailing, brand management, logistics management, market research, purchasing management and more.

Major Code: 799

Marketing major requirements are divided into two parts — lower-division and upper-division. The lower-division business core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division finance and business curricula. The lower-division business core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.
### Code Title Hours

**Summary of Requirements**

**Lower-Division**
- Business Core Classes (44-47) 66-69
- Marketing Class (4)  
- Math, Economics, Writing and Communications (18) 

**Upper-Division**
- Business Core Classes (34) 70
- Marketing Courses (36)  
- University General Education Requirements 40
- Unrestricted Electives 6-9

Total credits required for graduation 180

1 10 credits from lower-division course work satisfy University General Education Requirements.

### Marketing Program Requirements (180)

#### Marketing Curriculum (38)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>or BA 390</td>
<td>MARKETING</td>
<td></td>
</tr>
<tr>
<td>MRKT 390</td>
<td>BUILDING AND MANAGING PRODUCTS, SERVICES, AND BRANDS</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 396</td>
<td>FUNDAMENTALS OF MARKETING RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 489</td>
<td>PERSONAL SELLING SKILLS AND TECHNIQUES</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 499</td>
<td>MARKETING STRATEGY</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Marketing Specializations

Select one of the following specialties:
- Consumer Insights Specialization
- Marketing and Digital Communication Specialization
- Professional Sales and Personal Selling Specialization
- Marketing Management

Total Hours 38

### Marketing Specializations

#### Consumer Insights Specialization

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 481</td>
<td>INTRODUCTION TO BUSINESS ANALYTICS</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 486</td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 491</td>
<td>QUALITATIVE RESEARCH METHODS</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 496</td>
<td>MARKETING RESEARCH PRACTICUM</td>
<td>4</td>
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</table>

Complete a thesis, directed readings, projects, internship or study abroad: 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 403</td>
<td>THESIS</td>
<td></td>
</tr>
<tr>
<td>BA 405</td>
<td>READING AND CONFERENCE</td>
<td></td>
</tr>
<tr>
<td>BA 406</td>
<td>PROJECTS</td>
<td></td>
</tr>
<tr>
<td>BA 410</td>
<td>BUSINESS INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td></td>
</tr>
<tr>
<td>&amp; BA 349</td>
<td>and IMPACT OF CULTURE ON BUSINESS</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 14

#### Marketing and Digital Communication Specialization

Complete the following three courses:
- MRKT 484 | DIGITAL MEDIA AND MARKETING INTEGRATION    | 4     |
- MRKT 485 | SEARCH ENGINE MARKETING                   | 4     |
- MRKT 493 | INTEGRATED MARKETING COMMUNICATIONS       | 4     |

Complete a thesis, directed readings, projects, internship or study abroad: 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 403</td>
<td>THESIS</td>
<td></td>
</tr>
<tr>
<td>BA 405</td>
<td>READING AND CONFERENCE</td>
<td></td>
</tr>
<tr>
<td>BA 406</td>
<td>PROJECTS</td>
<td></td>
</tr>
<tr>
<td>BA 410</td>
<td>BUSINESS INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td></td>
</tr>
<tr>
<td>&amp; BA 349</td>
<td>and IMPACT OF CULTURE ON BUSINESS</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 14

### Business Administration Core Curriculum

The business administration core curriculum provides students with a broad overview of business; basic skills in accounting and quantitative methods; an understanding of the legal and social environment of business; a background in management and organizational behavior, marketing, finance, and operations management; an understanding of the entrepreneurial process; and the opportunity to integrate course work and further develop decision-making skills through the analysis of business cases.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>EC 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>EC 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

---

### Professional Sales and Personal Selling Specialization

Complete the following three courses:
- MGMT 455 | INFLUENCE AND NEGOTIATION                    | 4     |
- MRKT 486 | CUSTOMER RELATIONSHIP MANAGEMENT            | 4     |
- MRKT 488 | PERSONAL SELLING                            | 4     |

Complete a thesis, directed readings, projects, internship or study abroad: 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 403</td>
<td>THESIS</td>
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</tr>
<tr>
<td>BA 405</td>
<td>READING AND CONFERENCE</td>
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</tr>
<tr>
<td>BA 406</td>
<td>PROJECTS</td>
<td></td>
</tr>
<tr>
<td>BA 410</td>
<td>BUSINESS INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td></td>
</tr>
<tr>
<td>&amp; BA 349</td>
<td>and IMPACT OF CULTURE ON BUSINESS</td>
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Total Hours 14

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### Marketing Management

Complete at least three of the following courses: 12

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MRKT 484</td>
<td>DIGITAL MEDIA AND MARKETING INTEGRATION</td>
<td></td>
</tr>
<tr>
<td>MRKT 485</td>
<td>SEARCH ENGINE MARKETING</td>
<td></td>
</tr>
<tr>
<td>MRKT 486</td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>MRKT 488</td>
<td>PERSONAL SELLING</td>
<td></td>
</tr>
<tr>
<td>MRKT 491</td>
<td>QUALITATIVE RESEARCH METHODS</td>
<td></td>
</tr>
<tr>
<td>MRKT 493</td>
<td>INTEGRATED MARKETING COMMUNICATIONS</td>
<td></td>
</tr>
<tr>
<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>MRKT 496</td>
<td>MARKETING RESEARCH PRACTICUM</td>
<td></td>
</tr>
<tr>
<td>MRKT 497</td>
<td>GLOBAL MARKETING</td>
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<tr>
<td>MRKT 498</td>
<td>SERVICES MARKETING</td>
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Complete a thesis, directed readings, projects, internship or study abroad: 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 403</td>
<td>THESIS</td>
<td></td>
</tr>
<tr>
<td>BA 405</td>
<td>READING AND CONFERENCE</td>
<td></td>
</tr>
<tr>
<td>BA 406</td>
<td>PROJECTS</td>
<td></td>
</tr>
<tr>
<td>BA 410</td>
<td>BUSINESS INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>BA 348</td>
<td>INTERNATIONAL EXCHANGE ORIENTATION</td>
<td></td>
</tr>
<tr>
<td>&amp; BA 349</td>
<td>and IMPACT OF CULTURE ON BUSINESS</td>
<td></td>
</tr>
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</table>

Total Hours 14
Marketing Undergraduate Major (BA, BS, HBA, HBS)

### Marketing

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td>6-9</td>
</tr>
<tr>
<td>Students entering OSU on the Corvallis campus as their first college experience are required to participate in Innovation Nation, the College of Business Living-Learning Community (LLC). These students, as well as students who transfer in the winter term into the marketing major from another college or university, will complete the following three-course sequence during their first year:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td></td>
</tr>
<tr>
<td>BA 161</td>
<td>INNOVATION NATION–AWARENESS TO ACTION</td>
<td></td>
</tr>
<tr>
<td>BA 162</td>
<td>INNOVATION NATION–IDEAS TO REALITY</td>
<td></td>
</tr>
<tr>
<td>All other students will complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 101</td>
<td>BUSINESS NOW</td>
<td></td>
</tr>
<tr>
<td>All students should also complete:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>or COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>Bacc core, unrestricted electives (freshman and transfer students may only need 29 credits of Bacc Core and electives to reach a first year total of 45 credits)</td>
<td></td>
<td>31-32</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td>44-48</td>
</tr>
<tr>
<td>All students should complete the following courses*:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS (Transfer students only)</td>
<td></td>
</tr>
<tr>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
<td>1</td>
</tr>
<tr>
<td>BA 284</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III</td>
<td>1</td>
</tr>
<tr>
<td>*Students who transfer from another college or university into the marketing major who have completed all lower-division business core course work should complete the following course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 381</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>All second-year students should also complete:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>or BA 390</td>
<td>MARKETING</td>
<td></td>
</tr>
<tr>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
<td>4</td>
</tr>
<tr>
<td>BA 240</td>
<td>FINANCE</td>
<td>4</td>
</tr>
<tr>
<td>or BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td></td>
</tr>
<tr>
<td>BA 270</td>
<td>BUSINESS PROCESS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 275</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
<td>4</td>
</tr>
<tr>
<td><strong>Baccalaureate core, minor, option or unrestricted electives</strong></td>
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<td>11</td>
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<td><strong>Total Hours</strong></td>
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</table>

### Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 411</td>
<td>FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
<td>1</td>
</tr>
<tr>
<td>BA 412</td>
<td>THE DESIGN THINKING CHALLENGE</td>
<td>1</td>
</tr>
<tr>
<td>BA 413</td>
<td>FINANCIAL PLANNING II</td>
<td>1</td>
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<tr>
<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
<td>4</td>
</tr>
<tr>
<td><strong>Baccalaureate core, minor or unrestricted electives</strong></td>
<td></td>
<td>12</td>
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<tr>
<td><strong>Total Hours</strong></td>
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### Sample Four-Year Plan: Marketing

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
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</tr>
<tr>
<td>BA 160</td>
<td>B-ENGAGED</td>
<td>3</td>
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**Notes:**
- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)
<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Winter</td>
<td>BA 161</td>
<td>INNOVATION NATION–AWARENESS TO ACTION</td>
<td>3</td>
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<tr>
<td></td>
<td>BC Science</td>
<td></td>
<td>4</td>
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<tr>
<td></td>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION (Alpha coded)</td>
<td>3</td>
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<tr>
<td></td>
<td>or COMM 111</td>
<td>or *PUBLIC SPEAKING</td>
<td></td>
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<tr>
<td></td>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
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<tr>
<td></td>
<td>or COMM 218</td>
<td>or *INTERPERSONAL COMMUNICATION</td>
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<tr>
<td></td>
<td></td>
<td>Math through MTH 241</td>
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<tr>
<td></td>
<td></td>
<td>Hours</td>
<td>14</td>
</tr>
<tr>
<td>Spring</td>
<td>BA 162</td>
<td>INNOVATION NATION–IDEAS TO REALITY</td>
<td>3</td>
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<tr>
<td></td>
<td>BC Science</td>
<td></td>
<td>4</td>
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<td></td>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION (Alpha coded. Or Bacc Core:</td>
<td>3</td>
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<td></td>
<td>Fitness, Speech, CD, DPD)</td>
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<td></td>
<td></td>
<td>Hours</td>
<td>16</td>
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<tr>
<td>Second Year</td>
<td>Fall</td>
<td>BA 230</td>
<td>BUSINESS LAW I</td>
</tr>
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<td></td>
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<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
</tr>
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<td></td>
<td>BA 282</td>
<td>PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hours</td>
<td>13</td>
</tr>
<tr>
<td>Winter</td>
<td>BA 211</td>
<td>FINANCIAL ACCOUNTING</td>
<td>4</td>
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<tr>
<td></td>
<td>BA 223</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
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<tr>
<td></td>
<td>BA 275</td>
<td>FOUNDATIONS OF STATISTICAL INFERENCE</td>
<td>4</td>
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<td></td>
<td>BA 281</td>
<td>PROFESSIONAL DEVELOPMENT</td>
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<tr>
<td></td>
<td>BA 283</td>
<td>CREATIVITY, CULTURE, AND THE WORKPLACE</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Hours</td>
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<td>Spring</td>
<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
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<td></td>
<td>BA 240</td>
<td>FINANCE</td>
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<td>BUSINESS PROCESS MANAGEMENT</td>
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<tr>
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<tr>
<td></td>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
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<tr>
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<td>Fall</td>
<td>BA 311</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
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<tr>
<td></td>
<td>BA 247</td>
<td>INTERNATIONAL BUSINESS</td>
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<tr>
<td></td>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
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<tr>
<td></td>
<td>MRKT 390</td>
<td>BUILDING AND MANAGING PRODUCTS, SERVICES, AND BRANDS</td>
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<tr>
<td></td>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
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<td>or WR 323</td>
<td>or *ENGLISH COMPOSITION</td>
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<tr>
<td></td>
<td>or WR 327</td>
<td>or *TECHNICAL WRITING</td>
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<td></td>
<td></td>
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<tr>
<td>Winter</td>
<td>BA 312</td>
<td>THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II</td>
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<td></td>
<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
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<td></td>
<td>BA 375</td>
<td>APPLIED QUANTITATIVE METHODS</td>
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<td>Bacc Core-STS</td>
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<td>Hours</td>
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<td>Spring</td>
<td>BA 313</td>
<td>THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
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<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
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<td>BA 370</td>
<td>BUSINESS INFORMATION SYSTEMS OVERVIEW</td>
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<td>MRKT 396</td>
<td>FUNDAMENTALS OF MARKETING RESEARCH</td>
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<td>Fourth Year</td>
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<td>BA 406</td>
<td>PROJECTS</td>
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<td>FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I</td>
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<td></td>
<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
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<td>MRKT/Electives</td>
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<td>8</td>
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<tr>
<td></td>
<td></td>
<td>Hours</td>
<td>15</td>
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<tr>
<td>Winter</td>
<td>BA 412</td>
<td>THE DESIGN THINKING CHALLENGE</td>
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<tr>
<td></td>
<td>MRKT 489</td>
<td>PERSONAL SELLING SKILLS AND TECHNIQUES</td>
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<td>MRKT 496</td>
<td>MARKETING RESEARCH PRACTICUM</td>
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<td></td>
<td>MRKT/Electives</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hours</td>
<td>16</td>
</tr>
<tr>
<td>Spring</td>
<td>BA 413</td>
<td>FINANCIAL PLANNING II</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BA 466</td>
<td>INTEGRATIVE STRATEGIC EXPERIENCE</td>
<td>4</td>
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<tr>
<td></td>
<td>MRKT 499</td>
<td>MARKETING STRATEGY</td>
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<td></td>
<td>MRKT/Electives</td>
<td></td>
<td>6</td>
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<tr>
<td></td>
<td></td>
<td>Hours</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Hours</td>
<td>180</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)

Dean's Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
- Business Information Systems - College of Business (p. 257)
- Design and Innovation Management - College of Business (p. 261)
- Finance - College of Business (p. 265)
- Interior Design - College of Business (p. 270)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)
- Merchandising Management - College of Business (p. 281)

The Dean’s Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean’s Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean’s Academy Option provides students with:
• A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.

• Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.

• Pre-admission directly into professional school and your desired business major and abbreviated professional school application.

• Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

To earn the Dean’s Academy Option, students must complete a minimum of 21 credits, 15 of which must be at the upper-division level, of business or design coursework that have been designated as honors sections (i.e., the course has an “H” designation such as BA 160H (https://catalog.oregonstate.edu/search/?P=BA%20160H/)). All 300- and 400-level courses are considered upper-division courses. Any Honors section offered in the College of Business can be used to satisfy the Dean’s Academy Option requirements.

Option Code: 754

International Business Option

This option is offered within the following major(s):

• Accountancy - College of Business (p. 232)
• Business Administration - College of Business (p. 246)
• Business Information Systems - College of Business (p. 257)
• Finance - College of Business (p. 265)
• Management - College of Business (p. 272)
• Marketing - College of Business (p. 276)

The International Business option prepares students for positions in organizations engaged in international trade. Students study the economic, political, geographical, and socio-cultural factors that impact business across national boundaries. Areas of greatest opportunity for overseas assignments are with service organizations such as banks, consulting firms and accounting firms; with import/export firms; with governmental organizations; and in marketing and financial management areas of multinational firms. A career in international business can lead to exciting and rewarding opportunities abroad. Most multinational business firms, however, hire new employees first for domestic assignments in order to provide them with a thorough knowledge of the firm, its products, and its policies, or for specific assignments in one of the functional areas of the business, before providing overseas opportunities.

Because the majority of employees who eventually hold high-level positions in an international business start in entry-level positions within business areas, all international business students must also complete requirements for a primary discipline within a business. These disciplines include the majors in accountancy, business administration (Entrepreneurship, General Business, and Hospitality Management options), business information systems, finance, management and marketing.

Students earn this option with a minimum of one quarter term of study abroad through an international exchange or study abroad program approved by the College of Business. Students must complete a minimum of 18 quarter credits in business or business-related course work. The successfully completed course work must articulate back to OSU as courses that extend the knowledge and skills attained within the business core (that is, they cannot be used as a direct substitute for a business core course). Within the Arthur Stonehill International Business Exchange program offered through the College of Business, all courses offered by the partner schools are taught in English.

Option Code: 190

Merchandising Management Minor

This program was suspended per proposal 94292, July 13, 2015. The Merchandising Management minor emphasizes the merchandising of textile products such as apparel, outdoor gear, and home furnishings.

Minor Code: 416

The following are prerequisites for upper-division courses in the minor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 215</td>
<td>FUNDAMENTALS OF ACCOUNTING (or equivalent)</td>
<td>4</td>
</tr>
<tr>
<td>BA 390</td>
<td>MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

All courses must be taken on a graded (A–F) basis.

Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHE 255</td>
<td>Textiles (Terminated summer 2017)</td>
<td></td>
</tr>
<tr>
<td>DHE 270</td>
<td>*APPEARANCE, POWER AND SOCIETY</td>
<td>4</td>
</tr>
<tr>
<td>DHE 271</td>
<td>INTRODUCTION TO RETAIL BUYING</td>
<td>3</td>
</tr>
<tr>
<td>DHE 277</td>
<td>Fashion Trend Analysis (Terminated fall 2017)</td>
<td></td>
</tr>
<tr>
<td>DHE 326</td>
<td>SEWN PRODUCT DEVELOPMENT</td>
<td>5</td>
</tr>
<tr>
<td>DHE 370</td>
<td>*TEXTILE AND APPAREL MARKET ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>DHE 470</td>
<td>RETAIL MERCHANDISING</td>
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Select a minimum of 8 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>DHE 366</td>
<td>CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT</td>
<td>4</td>
</tr>
<tr>
<td>DHE 461</td>
<td>HISTORY OF THE NEAR ENVIRONMENT I</td>
<td>4</td>
</tr>
<tr>
<td>DHE 462</td>
<td>*HISTORY OF THE NEAR ENVIRONMENT II</td>
<td>4</td>
</tr>
<tr>
<td>DHE 463</td>
<td>HISTORY OF CONTEMPORARY FASHION</td>
<td>4</td>
</tr>
<tr>
<td>DHE 472</td>
<td>MERCHANDISE PLANNING AND CONTROL</td>
<td></td>
</tr>
</tbody>
</table>

DHE 473. Assortment Analysis and Management (Terminated spring 2015)
**Merchandising Management Undergraduate Major (BS, HBS)**

Students in the Merchandising Management program prepare for a variety of positions centered on researching, planning, and executing customer-right assortments of products and services. Graduates from this program can be found working for apparel, footwear, and hardline manufacturers as merchants who assist retailers in building product assortments, as product development coordinators who work with merchants and designers, as demand planners who predict what and how much needs to be produced for a given season, and as product creation support. They can also be found working for retailers as buyers and planners who work together to identify the right quantities and the right products to include in assortments, as merchants who work with buyers and design teams, as in-store merchandisers, and as store managers.

**Major Code: 416**

Merchandising Management major requirements are divided into two parts—lower-division and upper-division. The lower-division design core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division merchandising curricula. The lower-division design core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

**Minor Code: 416**

Merchandising Management major requirements are divided into two parts—lower-division and upper-division. The lower-division design core program involves completion of courses within the first and second year (see core curriculum below) that build a solid foundation for the upper-division merchandising curricula. The lower-division design core course work may be completed at OSU or any accredited college or university that offers equivalent courses transferable to OSU.

**University General Education Requirements**

- **Written and Oral Communication**
  - **COM 111** *PUBLIC SPEAKING 3
  - **or COMM 114** *ARGUMENT AND CRITICAL DISCOURSE
  - **or COMM 218** *INTERPERSONAL COMMUNICATION

- **Technology and Society**
  - **WR 222** *ENGLISH COMPOSITION 3
  - **or WR 323** *ENGLISH COMPOSITION
  - **or WR 327** *TECHNICAL WRITING

**University General Requirements**

- **Total credits required for graduation** 180
- **Total Hours** 28

1. The ART, COMM, ECON, MTH, and WR classes above meet the university’s baccalaureate core requirements for Mathematics, Social Processes and Institutions, Writing II, Speech, Western Culture, Literature and Arts, and Science, Technology and Society. All students must meet the other baccalaureate core requirements and the other requirements for baccalaureate degrees. (See Earning a Degree at OSU (p. 1609))

2. Students are provided elective credits to enable them to achieve a degree of specialization and depth to match their interests

**Merchandising Management Major**

**Course Title**

- **First Year**
  - **BA 160** BUSINESS NOW 6
  - **Students should also complete:**
    - **ART 101** *INTRODUCTION TO THE VISUAL ARTS 3
    - **COMM 111** *PUBLIC SPEAKING 3
      - **or COMM 114** *ARGUMENT AND CRITICAL DISCOURSE
      - **or COMM 218** *INTERPERSONAL COMMUNICATION
    - **DLSN 121** COMPUTER AIDED DESIGN 3
    - **MTH 111** *COLLEGE ALGEBRA 4
    - **WR 121** *ENGLISH COMPOSITION 3
  - **General Baccalaureate Core courses 20-23**

- **Second Year**
  - **All students should complete the following courses:**

Note: Students entering design programs should have basic art and illustration skills. ART 115, Foundations: 2-0 (4), and ART 117, Foundations: 3-0 (4), are highly recommended elective courses.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>BA 280</td>
<td>BUSINESS INSIGHTS (transfer students only)</td>
<td>3</td>
</tr>
<tr>
<td>DSGN 253</td>
<td>PROFESSIONAL DEVELOPMENT</td>
<td>1</td>
</tr>
<tr>
<td>DSGN 282</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I</td>
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<tr>
<td>DSGN 283</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II</td>
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<td>DSGN 284</td>
<td>PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III</td>
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<tr>
<td><strong>Students who transfer from another college or university into the merchandising management major who have completed all lower-division design core course work should complete the following course:</strong></td>
<td></td>
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</tr>
<tr>
<td>BA 281</td>
<td>PERSONAL AND PROFESSIONAL DEVELOPMENT</td>
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<tr>
<td>Second-year students should also complete:</td>
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<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART NEOCLASSICISM TO CONTEMPORARY</td>
<td>3</td>
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<tr>
<td>or ART 204</td>
<td>or *INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES</td>
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<tr>
<td>or ART 205</td>
<td>or *INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE</td>
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<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
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<td>DSGN 244</td>
<td>COLOR INNOVATION</td>
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<td>DSGN 255</td>
<td>TEXTILES</td>
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<tr>
<td>DSGN 276</td>
<td>INTRODUCTION TO MERCHANDISING MANAGEMENT</td>
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<tr>
<td>DSGN 281</td>
<td>DRAWING AND SKETCHING</td>
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<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
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<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
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<tr>
<td>WR 222</td>
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<td>3</td>
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<tr>
<td>or WR 323</td>
<td>or *ENGLISH COMPOSITION</td>
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<tr>
<td>or WR 327</td>
<td>or *TECHNICAL WRITING</td>
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<tr>
<td><strong>Third Year</strong></td>
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<tr>
<td>ART 367</td>
<td>*HISTORY OF DESIGN</td>
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<tr>
<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
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<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
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<td>BA 354</td>
<td>*MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY</td>
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<tr>
<td>BA 390</td>
<td>MARKETING</td>
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<td>or BA 223</td>
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<td>DSGN 311</td>
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<td>DSGN 312</td>
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<td>DSGN 313</td>
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<td>DSGN 330</td>
<td>*FASHION FORECASTING AND MARKET ANALYSIS</td>
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<td>DSGN 333</td>
<td>HISTORY OF CONTEMPORARY FASHION</td>
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<td>DSGN 341</td>
<td>DESIGN THINKING AND PROCESS INNOVATION</td>
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<td>DSGN 356</td>
<td>SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS</td>
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<td>DSGN 372</td>
<td>MERCHANDISE PLANNING AND CONTROL</td>
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<td>DSGN 377</td>
<td>RETAIL AND MERCHANDISING</td>
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<td>DSGN 471</td>
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<td>DSGN 473</td>
<td>RETAIL STRATEGIES PRACTICUM</td>
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<tr>
<td>DSGN 475</td>
<td>*GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR</td>
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<td>MGMT 364</td>
<td>PROJECT MANAGEMENT</td>
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<td>MRKT 492</td>
<td>CONSUMER BEHAVIOR</td>
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<td>MRKT 495</td>
<td>RETAIL MANAGEMENT</td>
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<td>Baccalaureate core, minor courses, or unrestricted electives</td>
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<td>Hours</td>
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* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)

**Major Code:** 416

**Course** | **Title** | **Hours**
---|---|---
**First Year** | | |
**Fall** | | |
BA 160 | B-ENGAGED | 3
MTH 111 | *COLLEGE ALGEBRA | 4
Biological Science with Lab | 4
Cultural Diversity | 3
PAC | Physical Activity Course | 1
**Hours** | | 15
**Winter** | | |
BA 161 | INNOVATION NATION—AWARENESS TO ACTION | 3
WR 121 | *ENGLISH COMPOSITION | 3
Physical Science with Lab | 4
DSCN 121 | COMPUTER AIDED DESIGN | 3
Difference, Power, Discrimination | 3
**Hours** | | 16
**Spring** | | |
BA 162 | INNOVATION NATION—IDEAS TO REALITY | 3
Physical or Biological Science with Lab | 4
COMM 111 | *PUBLIC SPEAKING | 3
ART 101 | *INTRODUCTION TO THE VISUAL ARTS (Lit/Art) | 3
HHS 231 | *LIFETIME FITNESS FOR HEALTH | 2
**Hours** | | 15
**Second Year** | | |
**Fall** | | |
ECON 201 | *INTRODUCTION TO MICROECONOMICS (Soc. Proc. & Inst) | 4
DSGN 255 | TEXTILES | 4
WR 222 | *ENGLISH COMPOSITION | 3
DSGN 276 | INTRODUCTION TO MERCHANDISING MANAGEMENT | 4
DSGN 282 | PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I | 1
**Hours** | | 16
**Winter** | | |
BA 260 | INTRODUCTION TO ENTREPRENEURSHIP | 4
BA 281 | PROFESSIONAL DEVELOPMENT | 3
DSGN 244 | COLOR INNOVATION | 4
ST 201 | PRINCIPLES OF STATISTICS | 4
DSGN 283 | PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II | 1
**Hours** | | 16
**Spring** | | |
ART 206 | *INTRODUCTION TO WESTERN ART NEOCLASSICISM TO CONTEMPORARY (Western Culture) | 3
DSGN 281 | DRAWING AND SKETCHING | 4
DSGN 284 | PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III | 1
**Electives** | | 5
**Third Year** | | |
**Fall** | | |
BA 315 | ACCOUNTING FOR DECISION MAKING | 4
**Hours** | | 13
DSGN 311  THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP I  1
DSGN 330  FASHION FORECASTING AND MARKET ANALYSIS  4
DSGN 333  HISTORY OF CONTEMPORARY FASHION  4
ART 367  HISTORY OF DESIGN (Science, Tech, Society)  3

Winter

DSGN 312  THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II  1
DSGN 372  MERCHANDISE PLANNING AND CONTROL  4
BA 390  MARKETING  4
DSGN 341  DESIGN THINKING AND PROCESS INNOVATION  4

Electives  4

Hours  16

Spring

BA 352  MANAGING INDIVIDUAL AND TEAM PERFORMANCE  4
BA 354  MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY  4
DSGN 313  THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III  1
DSGN 356  SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS  3
DSGN 377  RETAIL AND MERCHANDISING  4

Electives  4

Hours  17

Fourth Year

Fall

DSGN 411  FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT  1
DSGN 475  GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR (Cont. Global Iss.)  4
MRKT 492  CONSUMER BEHAVIOR  4

Electives  6

Hours  15

Winter

DSGN 412  FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II  1
MRKT 495  RETAIL MANAGEMENT  4
DSGN 471  RETAIL PRESENTATION STRATEGIES  4
MGMT 364  PROJECT MANAGEMENT  4

Electives  2

Hours  15

Spring

DSGN 413  FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III  1

Electives  14

Total Hours  185

Dean's Academy Option

This option is offered within the following major(s):

- Accountancy - College of Business (p. 232)
- Apparel Design - College of Business (p. 237)
- Business Administration - College of Business (p. 246)
- Business Analytics - College of Business (p. 252)
- Business Information Systems - College of Business (p. 257)
- Design and Innovation Management - College of Business (p. 261)
- Finance - College of Business (p. 265)
- Interior Design - College of Business (p. 270)
- Management - College of Business (p. 272)
- Marketing - College of Business (p. 276)
- Merchandising Management - College of Business (p. 281)

The Dean's Academy is designed for high achieving students who wish to maximize both the educational and experiential aspects of their college experience. The Dean's Academy encourages intellectual curiosity and active engagement in the educational process, and seeks to graduate students who are academically accomplished, visionary leaders and responsible citizens.

The Dean's Academy Option provides students with:

- A small, cohort-based program that promotes lifelong learning through personal engagement, intellectual involvement, and a sense of community.
- Designated classes that are smaller, allowing students to engage in thoughtful discussion with their professors and with each other.
- Pre-admission directly into professional school and your desired business major and abbreviated professional school application.
- Exclusive opportunities to attend workshops, forums, seminars, and events featuring thought-leaders in business.

Option Code: 754

Organizational Leadership Graduate Minor

Also available via Ecampus.

The Graduate Minor in Organizational Leadership provides an evidence-based exploration of organizational behavior, negotiations, team management, job design, evaluation and motivation of employees, human resource management, conflict management, employee stress, and work-life balance for non-College of Business graduate students. These skills are applicable across a wide range of disciplines for both Masters and Ph.D. graduate students. Students can customize their minor with a minimum of three to six credits of approved elective credits.

Minor Code: 2048

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<tr>
<th>Code</th>
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<th>Hours</th>
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<td>MGMT 552</td>
<td>ORGANIZATIONAL BEHAVIOR</td>
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<td>MGMT 553</td>
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<td>or MGMT 572</td>
<td>STRATEGIC HUMAN RESOURCE MANAGEMENT</td>
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<td>MGMT 574</td>
<td>NEGOTIATIONS</td>
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Elective Coursework

Select a minimum of 3 credits for Masters and 6 credits for Ph.D. students:

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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
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<td>BA 518</td>
<td>ADOPTING THE ENTREPRENEURIAL MINDSET</td>
<td>3-6</td>
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</table>
Organizational Leadership Minor

Also available via Ecampus.

The Undergraduate Minor in Organizational Leadership provides an evidence-based exploration of organizational behavior, negotiations, team management, job design, evaluation and motivation of employees, human resource management, conflict management, employee stress, and work-life balance.

Minor Code: 2048

Professional Sales Minor

The Professional Sales minor provides students with skills necessary for success in a sales career, and more broadly, skills useful for building mutually beneficial professional relationships. The ability to sell—that is, the ability to effectively communicate the value of an idea, product, service, or person, and to create win-win situations—is vital to success in a wide variety of positions and career options, including for-profit industry, non-profit organizations, government, and more. Further, many high-level executives and organization leaders start their careers as salespeople and rise to the top of their professions by effectively using sales skills.

Professional selling is the process of initiating, developing, and enhancing customer relationships, and meeting needs by creating, communicating, and delivering value. It consists of a sequence of activities, including: prospecting for potential customers, gaining an understanding of customer needs, communicating the value of an offering as a means of satisfying those needs, earning commitment from a customer, and maintaining and enhancing long-term customer relationships.

Minor Code: 817

School of Design and Human Environment

The School of Design and Human Environment offers undergraduate instruction in the areas of apparel design, interior/residential design, housing studies, and merchandising management. Advanced courses prepare students for positions in retailing of apparel and textile products, design and development of sewn products for manufacturers and retailers, housing design and policy, design of commercial and residential environments, and for graduate work leading to research and college and university teaching.

Graduate Studies

The school offers the MS, MA, MAIS, and PhD degrees. Areas of emphasis for the MS and MA degrees include cultural/historic aspects of the near environment, human behavior and the near environment, design in the near environment, and merchandising management and textiles. Areas of emphasis for the PhD degree include cultural/historic aspects of the near environment, design in the near environment, and human behavior and the near environment.

Pre-Professional Studies Admission Requirements

To be considered for admission to the professional majors of Apparel Design, Merchandising Management, and Interior Design (Interior Design option and Housing Studies option), a student must earn a minimum GPA and complete a list of designated courses. Application information is available in the College of Business Advising Office (http://business.oregonstate.edu/advising/) in Austin Hall 122.
Graduate Programs

Major

- Design and Human Environment (p. 292)

Minor

- Design and Human Environment (p. 293)

Minjeong Kim, Associate Dean
228 Milam Hall
Oregon State University
Corvallis, OR 97331-5101
Phone: 541-737-3796
Email: minjeong.kim@oregonstate.edu
Website: http://business.oregonstate.edu/

Faculty

Professors Burns, Marks
Associate Professors Chen, Kim, Lee, Mullet, Pedersen, Read
Assistant Professor Tural
Senior Instructors Burnett, Egan
Instructors Cluver, Gallagher, Scranton, Vong

Design and Human Environment

DHE 160. DESIGN PERSPECTIVES. (4 Credits)
Overview of how design reflects and shapes social, cultural, and temporal values and contexts across many different areas of design specialization. Areas to be explored include design processes, principles, and problem solving.

DHE 161. DESIGN EXPLORATIONS. (4 Credits)
Introduction to principles and theories of design through iterative development and making of project work. Topics include basic design terminology, design principles, and materiality. Lec/studio.
Prerequisites: DHE 160 with C- or better

DHE 170. INTRODUCTION TO THE TEXTILE AND APPAREL INDUSTRY. (4 Credits)
Overview of industry sectors involved in the planning, creation, production, merchandising, distribution, and consumption of textile, apparel, and related products. Overview of various career options within the industry.

DHE 180. INTRODUCTION TO SINGLE FAMILY HOUSING. (3 Credits)
Critical examination of single family housing. Considers space planning fundamentals. Introduces construction principles and methods. Develops a working knowledge of methods used to communicate architectural ideas.
Equivalent to: AIHM 180

DHE 181. INTRODUCTION TO INTERIOR DESIGN. (3 Credits)
Introduction to the interior design profession including space planning fundamentals, design process, color, sustainability, and human-centered design.

DHE 187. INTRODUCTION TO DESIGN COMMUNICATION. (0-3 Credits)
Fundamentals of design communication including drafting, lettering, illustrative sketching, perspective, and orthographic projections. Lec/studio.
Prerequisites: DHE 180 with C- or better

DHE 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AIHM 199
This course is repeatable for 16 credits.

DHE 227. APPAREL DESIGN AND PRODUCTION 1. (4 Credits)
Terminology, construction techniques and processes used to produce apparel. Development of production patterns and specifications with analysis of apparel construction related to equipment, cost, quality, end use and customer needs.
Equivalent to: AIHM 227

DHE 233. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Examination of fashion change in apparel from 1890 to the present. Recognition of style variations. Influence of socio-cultural factors.
Prerequisites: DHE 170 with C- or better
Equivalent to: DHE 463

DHE 242. INTRODUCTION TO SOFTGOODS MERCHANDISING. (4 Credits)
Overview of merchandising functions within the apparel industry, as well as how these functions interact with industry sectors involved in the planning, creation, production, distribution, and sale of apparel and related products. Wholesale and retail assortment planning. Basic merchandising mathematics. Excel skill development.
Equivalent to: DHE 271, DHE 276

DHE 262. HUMAN-CENTERED RESEARCH IN DESIGN AND MERCHANDISING. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context.
Prerequisites: DHE 161 with C- or better

DHE 263. HUMAN-CENTERED DESIGN THEORIES AND STRATEGIES. (4 Credits)
Overview of perception, semantics, and information design theories and strategies within a human-centered context.

DHE 270. APPEARANCE, POWER AND SOCIETY. (4 Credits)
Survey of the cultural, sociological, psychological, economic, and aesthetic influences on appearance and power. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: AIHM 270

DHE 271. INTRODUCTION TO RETAIL BUYING. (3 Credits)
Introduction to soft goods retailing with a focus on the role of the retail buyer. Fundamental retailing and merchandising concepts, sustainable and socially responsible decision-making related to retail buying, basic merchandising mathematics, and Excel skill development. Lec/lab.
Equivalent to: DHE 242, DHE 276

DHE 276. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Overview of merchandising functions within the textile and apparel industry. Fundamental merchandising concepts. Merchandising mathematics related to pricing and re-pricing, the profit and loss statement, and performance evaluation. Excel skill development. Lec/lab.
Prerequisites: DHE 170 with C- or better
Equivalent to: DHE 242, DHE 271, DSGN 276

DHE 281. DRAWING AND SKETCHING INTERIORS. (4 Credits)
Build technical drawing skills, observational and perspective drawing, as well as imagination and creativity. Working knowledge of visual methods for communicating design concepts and describing interior spaces.
Prerequisites: DHE 280 with D- or better
Equivalent to: AIHM 281, DSGN 281

DHE 283. BUILDING CONSTRUCTION AND MATERIALS. (3 Credits)
Introduction to the manufacture, characteristics and use of construction materials used in contract and residential construction, including environmentally friendly materials.
Equivalent to: DSGN 383
DHE 287. STUDIO I: DESIGN COMMUNICATION. (4 Credits)
Design communication through electronic media: 2D and 3D visualizations and presentations of interior space. Lec/studio.
Prerequisites: DHE 187 with C- or better
Equivalent to: DSGN 287

DHE 288. ENVIRONMENTAL BUILDING SYSTEMS. (3 Credits)
Lighting, heating, ventilating, air conditioning, and acoustical systems in residential and commercial buildings. Includes sustainable building principles.
Prerequisites: DHE 283 with C- or better and DHE 287 [C-]
Equivalent to: DHE 282

DHE 289. STUDIO II: RESIDENTIAL SPACE PLANNING. (4 Credits)
Utilization of space planning principles in the design of residences. Includes rendering, perspective drawing, graphic communication techniques, and model building.
Prerequisites: DHE 287 with C- or better
Equivalent to: DHE 385

DHE 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AIHM 299
This course is repeatable for 16 credits.

DHE 300. FIELD EXPERIENCE ORIENTATION AND DEVELOPMENT. (1-2 Credits)
Exploration of career choices, goals, and field experience opportunities; preparation in planning, obtaining, and completing an internship. Graded P/N. Section 1: Apparel Design. Section 2: Interior Design and Housing Studies. Section 3: Merchandising Management. Section 4: Graphic Design.
This course is repeatable for 3 credits.

DHE 310. FIELD EXPERIENCE. (1-12 Credits)
Integration and application of academic preparation in an on-the-job work situation with supervision by personnel at the participating site and university faculty. Application must be made prior to participation. Section 1: Merchandising Management (1-12) Section 2: Interior Design (1-12) Section 3: Apparel Design (1-12) Section 4: Graphic Design (1-12)
Graded P/N.
Prerequisites: DHE 300 with D- or better
Equivalent to: DHE 410, DSGN 410
This course is repeatable for 16 credits.

DHE 321. ILLUSTRATION, PORTFOLIO, AND DESIGN DEVELOPMENT. (3 Credits)
Techniques in technical drawing, fashion illustration, and portfolio development; use of computer-aided design applications in the design of apparel.
Prerequisites: DHE 245 with C- or better and DHE 277 [C-]
Equivalent to: AIHM 321

DHE 326. SEWN PRODUCT DEVELOPMENT. (5 Credits)
Materials, assembly process, quality factors, and costs in the development of sewn textile products; consideration of consumer product expectations and intended end-use. Lec/lab.
Prerequisites: DHE 250 (may be taken concurrently) with C- or better or DHE 255 (may be taken concurrently) with C- or better
Equivalent to: AIHM 326, DHE 476

DHE 327. APPAREL DESIGN AND PRODUCTION 2. (4 Credits)
Terminology, construction techniques and processes used to produce apparel. Development of production patterns and specifications. Development of original apparel designs.
Prerequisites: DHE 227 with C- or better
Equivalent to: AIHM 327, DSGN 327

DHE 328. COMPUTER-AIDED PATTERN DEVELOPMENT. (3 Credits)
Computer-aided flat pattern, grading and marker techniques using pattern development software.
Equivalent to: DSGN 328
Recommended: DHE 327 or previous flat pattern experience.

DHE 330. FASHION FORECASTING AND MARKET ANALYSIS. (4 Credits)
Forecasting and market analysis processes applied to fashion goods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 233 with C- or better and WR 121 [C-] and WR 222 [C-]
Equivalent to: DHE 370, DSGN 330

DHE 334. FASHION HISTORY AND SOCIETY. (4 Credits)
The influence of society, culture, geography, fashion, and technology on the design and consumption of dress, Late Middle Ages to 1899.
Prerequisites: DHE 330 with C- or better
Equivalent to: DHE 461

DHE 335. TEXTILE PERFORMANCE AND EVALUATION. (4 Credits)
Analysis and evaluation of textile materials and final products in relation to end use. Performance properties and serviceability testing, product specifications and industrial standards. Lec/lab.
Prerequisites: DHE 255 with C- or better
Equivalent to: DHE 453, DSGN 355

DHE 336. CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT. (4 Credits)
Sociocultural study of the function and design of clothing, housing, interiors, and textiles. Cultural diversity; impact of cross-cultural contact; ethnicity.
Equivalent to: AIHM 366, DHE 437

DHE 338. RETAIL MERCHANDISE PLANNING AND PRESENTATION. (4 Credits)
Organization, operation, and merchandising activities of the domestic textile and apparel industries. Analysis of the marketing process and the product/service mix of textile and apparel manufacturers. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 277 (may be taken concurrently) with C- or better
Equivalent to: AIHM 370, DHE 330, DSGN 330
Recommended: BA 390

DHE 340. COLLABORATIVE STUDIO. (4 Credits)
Examines a variety of collaborative methodologies and situations. Students will work across disciplines to solve complex collaborative projects. The projects will be both client based and hypothetical. Lec/studio.
Prerequisites: DHE 262 with C- or better and DHE 263 [C-]

DHE 346. FASHION HISTORY AND SOCIETY. (4 Credits)
Sociocultural study of the function and design of clothing, housing, interiors, and textiles. Cultural diversity; impact of cross-cultural contact; ethnicity.
Equivalent to: AIHM 366, DHE 437

DHE 348. TEXTILE AND APPAREL MARKET ANALYSIS. (4 Credits)
Organization, operation, and merchandising activities of the domestic textile and apparel industries. Analysis of the marketing process and the product/service mix of textile and apparel manufacturers. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 270 with C- or better and BA 215 [C-]
Equivalent to: DSGN 472

DHE 357. STUDIO III: ADVANCED DESIGN COMMUNICATION. (4 Credits)
Development of illustrative sketching, perspective drawing, concept model construction, and presentation materials.
Prerequisites: DHE 289 with C- or better
Equivalent to: DSGN 387
DHE 389. STUDIO IV: KITCHEN AND BATH DESIGN. (4 Credits)
Kitchen and bath planning in compliance with building codes and industry standards, with emphasis on resource conservation, safety, and special needs. This course utilizes both CAD and hand drafting.
Prerequisites: DHE 387 with C- or better

DHE 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AIHM 399
This course is repeatable for 16 credits.

DHE 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 401
This course is repeatable for 16 credits.

DHE 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 402
This course is repeatable for 16 credits.

DHE 403. THESIS. (1-16 Credits)
Equivalent to: AIHM 403, DSGN 403
This course is repeatable for 16 credits.

DHE 406. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 406, DSGN 406
This course is repeatable for 16 credits.

DHE 427. DRAPIING. (4 Credits)
Garment design based on manipulation of fabric on a body form; emphasis on the interrelationships between fabric, garment design, and the human form.
Prerequisites: DHE 321 with C- or better and DHE 327 [C-]
Equivalent to: AIHM 427, DSGN 427

DHE 428. APPAREL PRODUCTION PROCESSES. (4 Credits)
Production pattern-making, pattern grading, marker making, garment specifications, and cost analysis. Apparel assembly processes; analysis of equipment capabilities and production processes.
Prerequisites: DHE 327 with C- or better
Equivalent to: AIHM 428, DSGN 428

DHE 429. ADVANCED APPAREL DESIGN. (4 Credits)
Design processes and research methods used to develop apparel designs. Students will identify design problems and implement appropriate methods to develop apparel products.
Prerequisites: DHE 321 (may be taken concurrently) with C- or better and DHE 327 (may be taken concurrently) [C-] and DHE 427 (may be taken concurrently) [C-] and DHE 428 (may be taken concurrently) [C-]
Equivalent to: DSGN 429

DHE 437. CONSUMER BEHAVIOR AND CULTURE. (4 Credits)
Global and cultural consumer behavior, globalization and cross-cultural marketing related to soft goods merchandising and retailing.
Prerequisites: DHE 334 with C- or better
Equivalent to: DHE 366

DHE 443. STUDIO VI: COMMERCIAL DESIGN. (4 Credits)
Commercial design, space planning and specifications for facilities such as retail, hospitality, healthcare, public institutions and offices.
Prerequisites: DHE 389 with C- or better
Equivalent to: AIHM 443

DHE 445. STUDIO VII: ADVANCED COMMERCIAL DESIGN. (4 Credits)
Interior design project development with emphasis on design of hospitality environments. Application of knowledge of space planning, building codes, and specifications to projects. Studio work includes concept sketches, schematic drawings, contract documents, sample boards, and models.
Prerequisites: DHE 443 with C- or better

DHE 453. PRODUCT QUALITY ASSURANCE. (4 Credits)
Analysis and evaluation of textile materials and final products in relation to end use. Performance properties and serviceability testing, product specifications and industrial standards. Lec/lab.
Prerequisites: DHE 255 with C- or better
Equivalent to: AIHM 453, DHE 355
Recommended: DHE 326

DHE 461. HISTORY OF THE NEAR ENVIRONMENT I. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the ancient world to the Renaissance. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 461, DHE 334

DHE 462. HISTORY OF THE NEAR ENVIRONMENT II. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the Renaissance to 1899. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: AIHM 462, DHE 334

DHE 463. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men's and women's apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: AIHM 463, DHE 233
Recommended: DHE 461 or DHE 462

DHE 464. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of housing and interior design from the mid-19th century until the present.
Prerequisites: DHE 461 with C- or better or DHE 462 with C- or better
Equivalent to: AIHM 464, DSGN 464

DHE 470. RETAIL MERCHANDISING. (4 Credits)
Organization, operation, and competitive strategies of soft goods retailers. Planning, procurement, pricing, and promotion of merchandise assortments and inventory management.
Prerequisites: DHE 370 with C- or better
Equivalent to: AIHM 470

DHE 472. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles. Lec/rec.
Prerequisites: DHE 271 with C- or better and DHE 470 [C-] and (BA 215 [C-] or BA 215H [C-])
Equivalent to: DSGN 472

DHE 475. *GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR. (4 Credits)
Trade theory and the effects of trade policy, cultural values, and economics on the global production, distribution, and consumption of textiles, apparel, and footwear. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: AIHM 475, DSGN 475

DHE 476. LINE PLANNING AND PRODUCT DEVELOPMENT. (4 Credits)
Overview of the merchandising function within branded apparel companies and private label retailers.
Prerequisites: DHE 376 with C- or better
Equivalent to: DHE 326
DHE 481. PROFESSIONAL PRACTICE IN HOUSING AND INTERIOR DESIGN. (3 Credits)
Ethical, business, and legal aspects of the design profession. Development of written documents, schedules, specifications, and other materials typical of the profession. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 389 with C- or better
Equivalent to: AIHM 481

DHE 488. STUDIO VI: HEALTHCARE DESIGN. (4 Credits)
Interior design project development with emphasis on healthcare design, contract documents, and building codes.
Prerequisites: DHE 394 with C- or better
Equivalent to: DSGN 488

DHE 490. STUDY TOUR. (1-6 Credits)
Planned study tour with specific professional focus.
Equivalent to: AIHM 490
This course is repeatable for 16 credits.

DHE 499. SPECIAL TOPICS IN DESIGN AND HUMAN ENVIRONMENT. (1-16 Credits)
Equivalent to: AIHM 499
This course is repeatable for 16 credits.

DHE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 501
This course is repeatable for 16 credits.

DHE 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 502
This course is repeatable for 16 credits.

DHE 503. THESIS. (1-16 Credits)
Equivalent to: AIHM 503
This course is repeatable for 999 credits.

DHE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AIHM 505
This course is repeatable for 16 credits.

DHE 506. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 506
This course is repeatable for 16 credits.

DHE 507. SEMINAR. (1-16 Credits)
Equivalent to: AIHM 507
This course is repeatable for 16 credits.

DHE 508. WORKSHOP. (1-16 Credits)
Equivalent to: AIHM 508
This course is repeatable for 16 credits.

DHE 509. PRACTICUM. (1-16 Credits)
Equivalent to: AIHM 509
This course is repeatable for 16 credits.

DHE 510. INTERNSHIP. (1-16 Credits)
Equivalent to: AIHM 510
This course is repeatable for 16 credits.

DHE 528. APPAREL PRODUCTION PROCESSES. (4 Credits)
Production pattern-making, pattern grading, marker making, garment specifications, and cost analysis. Apparel assembly processes; analysis of equipment capabilities and production processes.
Equivalent to: AIHM 528
Recommended: DHE 327

DHE 529. ADVANCED APPAREL DESIGN. (4 Credits)
Design processes and research methods used to develop apparel designs. Students will identify design problems and implement appropriate methods to develop apparel products. Lec/studio.
Recommended: Completion or concurrent enrollment in DHE 327 and DHE 427 and DHE 428

DHE 561. HISTORY OF THE NEAR ENVIRONMENT I. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the ancient world to the Renaissance. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 561

DHE 562. HISTORY OF THE NEAR ENVIRONMENT II. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the Renaissance to 1899. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 562

DHE 563. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men's and women's apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: AIHM 563

DHE 564. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of housing and interior design from the mid-19th century until the present.
Equivalent to: AIHM 564

DHE 566. RESEARCH IN THE CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT. (3 Credits)
Examines the research methods used to study the cultural aspects of the near environment. Case studies concerning cultural variation in the design and use of fabric, clothing and adornment, housing.
Equivalent to: AIHM 566

DHE 572. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles.
Prerequisites: DHE 570 (may be taken concurrently) with C or better
Equivalent to: AIHM 572
Recommended: BA 215

DHE 582. AESTHETIC AND PERCEPTUAL THEORIES OF THE NEAR ENVIRONMENT. (2 Credits)
Aesthetic aspects from the philosophical and theoretical bases formulated in art, art history, and psychology as applied to the near environment.
Equivalent to: AIHM 582

DHE 585. HUMAN BEHAVIOR AND THE NEAR ENVIRONMENT. (3 Credits)
Application of concepts and theories from cultural anthropology, sociology, psychology, and social psychology to the study of clothing and interiors. The significance of the near environment in the dynamics of social interaction.
Equivalent to: AIHM 585

DHE 594. RESEARCH METHODS IN DESIGN AND HUMAN ENVIRONMENT. (3 Credits)
Introduction to theory and research design in Design and Human Environment. Includes sampling, measurement, data collection (both qualitative and quantitative) and data analysis.
DHE 599. SPECIAL TOPICS IN DESIGN AND HUMAN ENVIRONMENT. (1-16 Credits)
Equivalent to: AIHM 599
This course is repeatable for 16 credits.

DHE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 601
This course is repeatable for 16 credits.

DHE 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 602
This course is repeatable for 16 credits.

DHE 603. THESIS. (1-16 Credits)
Equivalent to: AIHM 603
This course is repeatable for 999 credits.

DHE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AIHM 605
This course is repeatable for 16 credits.

DHE 606. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 606
This course is repeatable for 16 credits.

DHE 607. SEMINAR. (1-16 Credits)
Equivalent to: AIHM 607
This course is repeatable for 16 credits.

DHE 608. WORKSHOP. (1-16 Credits)
Equivalent to: AIHM 608
This course is repeatable for 16 credits.

DHE 609. PRACTICUM. (1-16 Credits)
Equivalent to: AIHM 609
This course is repeatable for 16 credits.

DHE 610. INTERNSHIP/WORK EXPERIENCE. (1-16 Credits)
Equivalent to: AIHM 610
This course is repeatable for 16 credits.

DHE 690. THEORY DEVELOPMENT. (3 Credits)
Critical analysis of scientific explanation, research, theory, and paradigms. Focus on theory development, particularly within the area of the near environment.
Equivalent to: AIHM 690

DSGN 121. COMPUTER AIDED DESIGN. (3 Credits)
Introduction to the Adobe Creative Suite: Illustrator and Photoshop. Instruction in drawing, image editing, flat illustrations and textile design. Lec/studio.
Equivalent to: DSGN 221

DSGN 199. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 12 credits.

DSGN 226. SPECIFICATION BUYING. (4 Credits)
Introduction to terminology, assembly process, quality factors, and costs in the development of sewn product specifications. Lec/lab.

DSGN 244. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Equivalent to: DSGN 244H

DSGN 244H. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 244

DSGN 253. PROFESSIONAL DEVELOPMENT. (3 Credits)
This course is designed to give you an early start on the process of career planning and development. The process involves thoughtful self-assessment, career exploration, planning and follow-through with preliminary employment strategies. The philosophy of this course is that the career management process is ongoing, systematic, and aimed towards a fulfilling work life, which is part of your overall plan for personal development.
Prerequisites: BA 101 with C- or better or (BA 162 with C- or better or BA 162H with C- or better)
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385

DSGN 255. TEXTILES. (4 Credits)
Equivalent to: DHE 255

DSGN 276. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Provides the introductory knowledge necessary to prepare students for working in the retail industry. Introduces students to the retail industry including basic terminology, industry history, and to merchandising management decisions. Prepares students for more advanced knowledge acquired in the Merchandising Management concentration.
Equivalent to: DHE 276

DSGN 281. DRAWING AND SKETCHING. (4 Credits)
Designed for both beginning drawers and those wanting to improve their skills. Focuses exclusively on hand drawing skills with an emphasis on technical drawing skills, observational and perspective drawing, as well as imagination and creativity. Students develop a working knowledge of visual methods for communicating design concepts. Class format includes a combination of quick drawing activities, demonstrations, lectures, critiques, and work time on drawing assignments. Throughout the term students are introduced to the drawings of several prominent designers and artists.
Equivalent to: DHE 281

DSGN 282. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 282
DSGN 283. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 283

DSGN 284. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 284

DSGN 287. STUDIO I: DESIGN COMMUNICATION. (4 Credits)
Focuses on design communication through electronic media. Students use AutoCAD, SketchUp, and the Adobe Creative Cloud to create 2D and 3D visualizations and presentations of interiors. Lec/studio.
Equivalent to: DHE 287

DSGN 311. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP I. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 311

DSGN 312. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 312

DSGN 313. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 313

DSGN 327. PERFORMANCE APPAREL INNOVATION I. (4 Credits)
Develop innovative performance apparel from technical specifications or prototypes. Analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/lab.
Prerequisites: DSGN 226 with C- or better
Equivalent to: DHE 327

DSGN 328. DIGITAL DESIGN FOR APPAREL. (3 Credits)
Computer-aided flat pattern, grading and marker techniques using industry relevant pattern development software.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 328

DSGN 329. SPORTSWEAR INDUSTRY COLLABORATION. (3 Credits)
Industry lead team project. Creation of briefs, sketch, pattern, design textile prints, construct prototypes based on identified consumer and company.
Prerequisites: DSGN 327 with C- or better

DSGN 330. *FASHION FORECASTING AND MARKET ANALYSIS. (4 Credits)
Forecasting and market analysis processes applied to fashion goods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WR 222 with C- or better or WR 323 with C- or better or WR 327 with C- or better
Equivalent to: DHE 330

DSGN 333. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men’s and women’s apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: DHE 233, DHE 463

DSGN 335. APPAREL AND FOOTWEAR VALUE CHAIN. (3 Credits)
Survey of the structure, functions, and current trends within the apparel and footwear value chain.

DSGN 341. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Equivalent to: DSGN 341H

DSGN 341H. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 341
DSGN 342. INTRODUCTION TO DESIGN MANAGEMENT. (4 Credits)
Introduces the foundations and concepts of design strategy and creative development.
Prerequisites: DSGN 341 with C- or better

DSGN 343. IDEA VISUALIZATION. (4 Credits)
Focuses on the design process through visual communication of ideation and sketching.
Prerequisites: DSGN 342 with C- or better

DSGN 352. TEXTILES FOR INTERIORS. (4 Credits)
Types, qualities, and maintenance of functional and decorative fabrics for homes and public buildings. Use of specifications, standards, and legislation.
Prerequisites: DSGN 255 with C- or better or DHE 255 with C- or better
Equivalent to: DHE 352

DSGN 355. SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS. (4 Credits)
Specification of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance. Lec/lab.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Equivalent to: DHE 355

DSGN 356. SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS. (3 Credits)
Specification of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance.
Prerequisites: DSGN 255 with C- or better

DSGN 357. EVALUATION OF PERFORMANCE MATERIALS LABORATORY. (1 Credit)
Evaluation of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Recommended: Concurrent enrollment with DSGN 356

DSGN 372. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles.
Prerequisites: DSGN 276 with C or better
Equivalent to: DSGN 472

DSGN 377. RETAIL AND MERCHANDISING. (4 Credits)
Evaluation of performance within the merchandising functions of an organization. Development of merchandising plans based on quantitative and qualitative analysis, as well merchandising principles.
Prerequisites: DSGN 372 with C- or better or DSGN 472 with C- or better

DSGN 383. BUILDING CONSTRUCTION AND MATERIALS. (3 Credits)
An introduction to the manufacture, characteristics, sustainability, and use of construction materials in commercial and residential construction.
Equivalent to: DHE 283

DSGN 387. STUDIO III: ADVANCED DESIGN COMMUNICATION. (4 Credits)
Development of presentation and Building Information Modeling (BIM) skills through various computer programs including Adobe Illustrator, Adobe Photoshop, Sketchup, and Revit Architecture. In-class exercises and take-home assignments.
Prerequisites: DSGN 287 with C- or better
Equivalent to: DHE 387

DSGN 388. STUDIO IV: HOSPITALITY DESIGN. (4 Credits)
Study and design of hospitality spaces in compliance with building codes and industry standards, with emphasis on sustainability, safety, and cultural context.
Prerequisites: DSGN 387 with C- or better
Equivalent to: DHE 388

DSGN 394. STUDIO V: LIGHTING DESIGN. (4 Credits)
Lighting design and documentation for residential and small commercial projects. The commercial projects include space planning and lighting design for workspace and retail environments. Lec/Studio.
Prerequisites: DSGN 388 with C- or better or DHE 388 with C- or better
Equivalent to: DHE 394

DSGN 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

DSGN 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

DSGN 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

DSGN 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

DSGN 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

DSGN 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

DSGN 410. DESIGN INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N.
Equivalent to: DHE 410
This course is repeatable for 16 credits.

DSGN 411. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment. DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 411
DSGN 412. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment. DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 412

DSGN 413. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment. DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 413

DSGN 422. DHE FASHION SHOW AND DESIGN EXHIBITION. (1-16 Credits)
Special topics in design and human environment.
Equivalent to: DHE 422
This course is repeatable for 16 credits.

DSGN 427. PERFORMANCE APPAREL INNOVATION II. (4 Credits)
Develop innovative performance apparel from technical specifications or prototypes. Analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/lab.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 427

DSGN 428. TECHNICAL SPORTSWEAR SIZING AND FIT. (4 Credits)
Development of sizing and grading systems used in sportswear and evaluation of garment fit by use of virtual and physical prototypes.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 428

DSGN 429. FUNCTIONAL DESIGN AND PRODUCT DEVELOPMENT. (4 Credits)
Design processes and research methods used to create functional designs. Students will identify design problems and develop design brief and functional product line for identified target company. Lec/lab.
Prerequisites: DSGN 428 with C- or better
Equivalent to: DHE 429

DSGN 440. DESIGN RESEARCH. (4 Credits)
Surveys design principles, methods and applications in business outcomes. Application of design research is investigated and analyzed in group projects.
Prerequisites: DSGN 343 with C- or better

DSGN 441. SERVICE DESIGN INNOVATION. (4 Credits)
Focuses on the impact that service design has on business enterprises. Creative ideation, critical analysis, and innovative thinking are integrated as foundations for service design outcomes.
Prerequisites: DSGN 440 with C- or better

DSGN 442. MATERIALITY AND MAKING FIELD PROJECT. (4 Credits)
Focuses on material properties and specifications. Students work in the makerspace to design product outcomes.
Prerequisites: DHE 440 with C- or better or DSGN 440 with C- or better
Equivalent to: DHE 442

DSGN 444. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of interior design from the mid-19th century to the present.
Prerequisites: ART 204 with C- or better or ART 205 with C- or better or ART 206 with C- or better
Equivalent to: DHE 444

DSGN 488. STUDIO VI: HEALTHCARE DESIGN. (4 Credits)
Provides an overview of, and examines competitive presentation strategies within, retail environments and channels (e.g., in-store, catalog, online, mobile) by integrating the principles and elements of design with sensory marketing.
Prerequisites: DSGN 377 with C- or better and (BA 390 [C-] or BA 390H [C-] or BA 223 [C-] or BA 223H [C-] or MRKT 390 [C-])

DSGN 495. RETAIL PRESENTATION STRATEGIES. (4 Credits)
Provides an overview of, and examines competitive presentation strategies within, retail environments and channels (e.g., in-store, catalog, online, mobile) by integrating the principles and elements of design with sensory marketing.
Prerequisites: DSGN 377 with C- or better

DSGN 495. *GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR. (4 Credits)
Trade theory and the effects of trade policy, cultural values, and economics on the global production, distribution, and consumption of textiles, apparel, and footwear. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: DHE 495

DSGN 495. STUDIO VII: SENIOR THESIS II. (4 Credits)
Indirect material and making and coursework and instruction in the second half of the studio. Students work in the makerspace to design product outcomes.
Prerequisites: DSGN 488 with C- or better
Equivalent to: DHE 495

Design and Human Environment Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Apparel design, cultural and historic aspects of the near environment, human behavior in the near environment, interior design, merchandising management, and textiles

Admission to the Design and Human Environment graduate major has been suspended, November 2015.
The School of Design and Human Environment offers graduate work leading toward Master of Science, Master of Arts, and Doctor of Philosophy degrees in Design and Human Environment.

Areas of concentration for MS and MA degrees include apparel design, cultural and historic aspects of the near environment, human behavior the near environment, interior design, merchandising management, and textiles.

Areas of concentration for the PhD degree include cultural and historic aspects of the near environment, human behavior in the near environment, merchandising management, and textiles.

Graduate programs in DHE prepare students for college and university teaching, research and creative scholarship; careers in design, product development, product quality assurance or merchandising; historic/ cultural research, collection management, and preservation of textile and architectural artifacts; and public policy.

Research is a central component of the DHE graduate program. Students have an opportunity to work on research and creative scholarships with internationally recognized faculty members who have published in the areas of historic costume, human behavior and the near environment, apparel design, interior design, fashion theory, consumer behavior, and housing.

For further information, visit the College of Business website (http://gradschool.oregonstate.edu/programs/4410/design-and-human-environment-phd-ma-ms-minor/), email MBAInfo@bus.oregonstate.edu or gradschool.oregonstate.edu/programs/4410/design-and-human-environment. Call 541-737-5510.

Major Code: 4410

Design and Human Environment Graduate Minor

Minor Code: 4410

Supply Chain and Logistics Management Graduate Certificate

The SCLM certificate program provides a means for individuals to acquire a solid mastery of international operations and supply chain and logistics management concepts and methods. This graduate certificate prepares individual for operations, logistics and supply chain management in the service and manufacturing industries. In the past two decades, the loss of manufacturing jobs in the U.S. triggered attrition of innovation capabilities across many sectors of the economy contributing to the current anemic economic recovery. The U.S. needs a professionally-trained workforce that is able to manage internal operations and global supply chains in the manufacturing and service sectors and in government agencies. Well trained operations and supply chain managers are also needed in global companies that operate outside the U.S., including companies that operate in the Asia-Pacific Rim.

Certificate Code: CG19
to extend information to society about Earth, oceans and atmosphere, including their interactions and the interrelationships with humans and ecosystems.

The college prepares students for professional careers and enables faculty to seek out new ideas and innovative approaches to the complex issues of planetary-scale science.

History
In 2011, the College of Earth, Ocean, and Atmospheric Sciences was created by the merger of the College of Oceanic and Atmospheric Sciences (COAS), the Department of Geosciences, and the Environmental Sciences Undergraduate Program in the College of Science. The college is at the heart of a new research and education enterprise organized around the interdisciplinary sciences of the Earth, ocean, and atmosphere. It spans the natural science disciplines and creates strong linkages with the social sciences both within the college as well as around the university.

The college is Oregon's principal source of expert knowledge about the Earth, ocean, and the atmosphere, especially in the Pacific Northwest region, which has long been the focus of major research efforts by OSU researchers. It conducts the only comprehensive oceanographic and atmospheric research programs in Oregon, as well as major programs in geology, geography, and geospatial studies. Today, research activities of the college extend throughout the world and to all oceans. Its graduates hold professional and leadership positions in science, resource management, education, regulatory agencies, and the private sector in the United States and internationally.

The new college has celebrated 100 years of excellence in the Geology program while establishing new degree options in ocean and climate science. The college has diversified and increased general education courses and offers certificates in geospatial studies and water conflict science. The college has diversified and increased general education courses and offers certificates in geospatial studies and water conflict science. The college fosters experiential learning through labs, field, and shipboard experiences.

Undergraduate Programs

Program Requirements
The University Baccalaureate Core requirements are explained in a separate section, Earning a Degree at Oregon State University (p. 1609). The major and option requirements are explained below. If you want to add a minor program or certificate, you will also need to complete the requirements for that minor or certificate. Specific requirements for interdisciplinary minors are listed in the Interdisciplinary Programs section of this catalog.

Academic Advising
Undergraduates within CEOAS are assigned a professional advisor based on the student's major program of study. Advisors help to monitor academic progress through the degree programs, assist students with defining goals within the major, help in navigating university policies and regulations, and provide referrals to campus-wide resources. Faculty within CEOAS are involved as mentors for undergraduates—to guide students on professional and career-related decisions and to help connect students with research opportunities.

Internships and Experiential Learning
CEOAS places a strong emphasis in gaining experience outside of the classroom and offers specialized support to all students for internships and undergraduate research through a designated experiential learning coordinator available to all undergraduates within the college.

Teacher Education
The Earth Sciences and Environmental Sciences majors provide excellent scientific preparation for teaching middle school and high school science. All professional teacher licensure certification occurs in the College of Education.

Double Degrees
Undergraduates with majors in CEOAS can earn a second degree in education, innovation management, international studies, or sustainability. See the College of Education, College of Business, International Programs or Department of Forest Ecosystems and Society sections of this catalog for more information.

College Undergraduate Graduation Requirements
Along with fulfilling the university-level, baccalaureate core, and major requirements for BS degrees within CEOAS, students must meet the following college requirements:

- A grade of at least C– minus is required for all upper-division (300 level and above) courses taken to fulfill major requirements.
- A minimum 2.00 GPA in major requirement courses (excluding baccalaureate core and electives) is required for all CEOAS majors.
- ‘S/U’ grading is not allowed for courses taken to fulfill major requirements.

Graduate Programs

Requirements for Admission to the Graduate Programs in the College
1. A bachelor's degree with a major (40 quarter credits or more) in a relevant discipline (see individual program requirements) such as physics, mathematics, chemistry, biology, geology, atmospheric science, computer science, or engineering. Geography and Marine Resource Management applicants also have a bachelor's degree in the social or political sciences, geography, economics, business administration, or fisheries.
2. A minimum cumulative grade-point average of 3.00 on a 4.00 scale for the last 90 quarter credits of undergraduate work.
3. A solid foundation in prerequisites (see individual program requirements).
4. Graduate Record Examination (GRE) scores (general).
5. Three letters of recommendation.
6. For TOEFL requirements, please see the OSU Admissions Web pages for graduate requirements and contact the CEOAS Student Services Office for specific information.

Early January is the deadline to apply for the following fall term admission. Early application is strongly recommended.

Master's Programs
All students in College of Earth, Ocean, and Atmospheric Sciences graduate majors must satisfy the minimum program requirements (45 credits including 6 credits of thesis) established by the Graduate School. Some graduate credits earned at other institutions may be approved for inclusion in the program. The Marine Resource Management graduate program requires additional course work credits. Please contact the Student Services for more information.
A two-hour, final oral examination is required for completion of the master’s program (thesis option only).

**Doctor of Philosophy Program**

The content of PhD programs, other than core requirements, is determined by individual students and their committees. Specific university requirements are formulated by the Graduate School. Approximately 80 credits of courses in the graduate major (including the core courses and 30 to 35 credits of thesis) are usually included in the major. The dissertation is based on an original investigation in some area of the graduate major.

One year of courses taken as a part of a master’s program is normally transferable into the PhD program.

**Faculty**

**Professors** Barnes, Barth, Becker, Benoit-Bird, Bloomer, Brook, Campana, Cianelli, Clark, Colwell, Conway, Crump, Davis, de Silva, Dever, Dilles, Egbert, Goldfinger, Goni, Graham, Haggerty, Hales, Haller, Harris, Harte, Jones, Kent, Kopper, Kosro, Letelier, Lyle, Matano, Marinelli, Meigs, Mellinger, Mix, Mote, Moum, Nabelek, Nash, Nielsen, Nolin, Noone, Özkul-Haller, Reimers, Samelson, Schultz, Skyllingstad, Smyth, Spitz, Torres, Trehu, Wheatcroft, Wolf

**Associate Professors** Carlson, Corcoran, de Szoekke, Gosnell, Haley, Kirby, Kurapov, Lancaster, Lerczak, Matsumoto, Ruggiero, Santelmann, Schmittner, Shearman, Shell, Stoner, Tepley, Tufillaro, Waldbusser, White

**Assistant Professors** Bernard, Buizert, Copeman, Creveling, Durland, Fehrenbacher, Fram, Haxel, Hutchings, Jarvis, Jurasek, Kennedy, McKay, O’Neill, Rupp, Shiel, Shroyer, Thurber, Tilt, Van Den Hoek, Wettstein, Wilson, Wrathall, Zhao

**Senior Instructors** L. Becker, Cook, Hommel, K. Yalcin

**Instructors** Hyrapet, Keller, Milstein, Nelson, R. Yalcin

**Academic Advisors** Chuinard (head advisor), Gaid, Lieuallen, Menn

**Experiential Learning Coordinator** Cardinal-Lanier

**Emeriti**


**Undergraduate Programs**

**Majors**

- Earth Sciences (p. 317)
  - Options:
    - Climate Science
    - Geology
    - Ocean Science
  - Environmental Sciences (p. 321)
  - Options:
    - Alternative Energy
    - Applied Ecology
    - Aquatic Biology
    - Chemistry and the Environment
    - Conservation, Resources, and Sustainability
    - Earth Systems
    - Environmental Agriculture
    - Environmental Policy and Economics
    - Environmental Science Education
    - Environmental Water Resources
    - Geography and Geospatial Science (p. 331)

**Minors**

- Earth Sciences (p. 317)
- Environmental Sciences (p. 320)
- Geography (p. 334)
- Geology (p. 335)
- Oceanography (p. 338)

**Certificates**

- Geographic Information Science (p. 330)

**Graduate Programs**

**Majors**

- Geography (p. 334)
- Geology (p. 335)
- Marine Resource Management (p. 336)
- Ocean, Earth and Atmospheric Sciences (p. 337)

**Minors**

- Geography (p. 334)
- Geology (p. 335)
- Marine Resource Management (p. 337)
- Ocean, Earth and Atmospheric Sciences (p. 338)
- Risk and Uncertainty Quantification in Earth Systems (p. 338)
- Water Conflict Management and Transformation (p. 341)

**Certificates**

- Geographic Information Science (p. 330)
- Water Conflict Management and Transformation (p. 340)
- Marine Resource Management (p. 336)

**Atmospheric Sciences**

**ATS 003. UNDERGRADUATE RESEARCH. (0 Credits)**

Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

**ATS 004. INTERNSHIP. (0 Credits)**

Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.
ATS 201. *CLIMATE SCIENCE. (4 Credits)
Physical laws governing the Earth's climate and their interactions with chemical and biological processes on land and in the atmosphere, oceans, and cryosphere. Past, present, and potential future climate changes due to natural and human causes are assessed using a variety of observations, models, and laboratory exercises. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

ATS 295. OBSERVING CLIMATE. (3 Credits)
One-week course taught during Spring Break at field sites near Corvallis, with ten hours of preparatory meetings on campus. Make and analyze observations of properties of the atmosphere, ocean, biosphere, and cryosphere that reflect processes relevant to regional and global climate. Serves as an introduction to upper-division course work in climate science. Field trip(s) required; transportation fee charged. Lec/lab.
Prerequisites: ATS 201 with C- or better or ATS 320 with C- or better

ATS 301. CLIMATE DATA ANALYSIS. (4 Credits)
Quantitative methods to characterize the physical climate system and detect change. Interpret data based on source timescale, and statistics; communicate conclusions and uncertainties regarding past climate and future changes.
Prerequisites: ATS 201 with C- or better and ST 351 [C-]

ATS 302. MATHEMATICAL APPLICATIONS IN THE EARTH SCIENCES. (4 Credits)
An introductory survey of mathematical applications in climate science, meteorology, oceanography, geology, and geophysics. Topics may include conservation laws, harmonic motion, exponential growth/decay, linear approximations, numerical methods, waves, diffusion, fluid flow, systems of equations, inverse problems, and data analysis.
Prerequisites: MTH 252 with C- or better
Recommended: PH 201 or PH 211

ATS 310. METEOROLOGY. (4 Credits)
The study of the atmosphere, in particular atmospheric phenomena that we experience as weather. Key physical concepts in meteorology are introduced and explored. The physics of the atmosphere necessary to understand why atmospheric phenomena occur and how these are forecast is discussed. Meteorological data from observations and models will be analyzed to explore concepts introduced in the context of the weather we experience. Lec/Lab.
Prerequisites: (MTH 251 with C- or better or MTH 251H with C- or better) and (PH 201 [D-] or PH 201H [D-] or PH 211 [D-] or PH 211H [D-]) and (PH 202 (may be taken concurrently) [D-] or PH 202H (may be taken concurrently) [D-] or PH 212 (may be taken concurrently) [D-] or PH 212H (may be taken concurrently) [D-] or CH 121 (may be taken concurrently) [D-] or CH 231 (may be taken concurrently) [D-] or CH 231H (may be taken concurrently) [D-])

ATS 341. *SNOW, SMOKE, AND STORMS: CLIMATE CHANGE IMPACTS IN THE PNW. (3 Credits)
Climate change will alter mountain snowpack, water availability, coastal storms, erosion, and sea level in the Pacific Northwest. Increasing temperatures and changing precipitation patterns will lead to more extreme drought and flooding events, wildfire seasons, and insect and disease outbreaks in forests. These changes will impact the region’s natural resource economy; heritage and quality of life; water, transportation, and energy infrastructure; and health and social systems. Case studies of past extreme years highlight the close interrelationships between the climate, the natural and built environment, and the health and well-being of the Pacific Northwest’s residents.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ATS 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ATS 399H
This course is repeatable for 12 credits.

ATS 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ATS 399
This course is repeatable for 12 credits.

ATS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 403. THESIS. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ATS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 407. SEMINAR. (1 Credit)
One-credit sections. Graded P/N.
This course is repeatable for 48 credits.
Recommended: 12 credits of upper-division college courses

ATS 411. THERMODYNAMICS AND CLOUD MICROPHYSICS. (4 Credits)
Thermodynamic processes in the atmosphere, and an introduction to cloud microphysics. Offered annually.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and (PH 213 [D-] or PH 213H [D-])

ATS 412. ATMOSPHERIC RADIATION. (3 Credits)
Radiative transfer in the earth and planetary atmospheres, absorption and scattering of sunlight, absorption and emission of terrestrial radiation, absorption and scattering cross sections for molecules, cloud droplets and aerosols. Applications include enhancement of photochemical reaction rates in clouds, remote sensing, and the earth's radiation budget, radiative-convective equilibrium, radiative forcing due to changes in atmospheric composition and climate change.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and (MTH 256 [D-] or MTH 256H [D-]) and (PH 213 [D-] or PH 213H [D-])

ATS 413. ATMOSPHERIC CHEMISTRY. (3 Credits)
Principles of atmospheric chemistry, chemical fundamentals, sampling principles, sources, reactions, scavenging, and deposition of sulfur, nitrogen, ozone, and carbon compounds. Atmospheric aerosol size distribution, mechanics, optics, and scavenging. Offered annually.
Recommended: (CH 121 [D-] or CH 201 [D-] or CH 231 [D-] or CH 231H [D-]) and (MTH 251 [D-] or MTH 241[D-])
ATS 415. ATMOSPHERIC DYNAMICS. (4 Credits)
Prerequisites: ATS 301 with C- or better and ATS 310 [C-] and (ATS 302 (may be taken concurrently) [C-] or MTH 254 (may be taken concurrently) [C-J]) and (PH 202 (may be taken concurrently) [C-] or PH 212 (may be taken concurrently) [C-I])

ATS 417. WEATHER SYSTEM DYNAMICS AND FORECASTING. (4 Credits)
Dynamics of weather systems and basic forecasting methods. Mid-latitude storm formation and structure; basic dynamical equations and applications to real-time weather; map analysis; description and interpretation of weather prediction models; forecasting methods; Pacific NW weather. Lec/Lab.
Prerequisites: ATS 310 with C- or better or ME 311 with C- or better or ME 311H with C- or better or BEE 311 with C- or better or CE 311 with C- or better

ATS 420. PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE. (4 Credits)
Physics of climate past, present and future. Covers radiative processes, thermodynamics, and dynamics, as well as the paleoclimate record and mechanisms driving this variability. Current modes of climate variability (e.g., ENSO) will also be surveyed. Climate models, ranging from 0- to 3-dimensional, will be examined and projections for the future assessed.
Recommended: MTH 252 and (PH 202 or PH 202H or PH 212 or PH 212H)

ATS 421. CLIMATE MODELING. (4 Credits)
Numerical models of the physics, chemistry, biology, and geology of the climate system. A range of climate models from a simple, single equation to complex state-of-the-science systems used for future projections. Theoretical concepts will be linked to practical applications through hands-on programming exercises and data analysis. Lec/lab.
Recommended: ATS 420 or ATS 520

ATS 441. *NORTHWEST CLIMATE AND WEATHER. (4 Credits)
A survey of climate and weather phenomena that are consequential in the northwestern United States. The Pacific Ocean, the North Pacific jet and storm track, mountain and coastal meteorology, and topographic features like the region's mountains and Columbia River Gorge all affect the climate and weather of the Northwest, which in turn affect the region's hydrologic characteristics, vegetation, and numerous other natural and human systems. Preexisting content knowledge and analytical skills are used to produce a comprehensive written report and oral presentation for a regional stakeholder. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ATS 301 with C- or better and ATS 420 [C-]

ATS 475. PLANETARY ATMOSPHERES. (3 Credits)
Origin and evolution of planetary atmospheres; vertical structure of atmospheres; hazes and clouds; atmospheric motions and general circulation. Presentation of recent observations and current research issues, focusing on Venus, Earth, Mars, Jupiter, Saturn, and Titan. Emphasis on comparative aspects and simple models.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and (PH 213 [D-] or PH 213H [D-])

ATS 499. SPECIAL TOPICS. (0-4 Credits)
Equivalent to: ATS 499H
This course is repeatable for 12 credits.

ATS 501. RESEARCH. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ATS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ATS 506. PROJECTS. (1-16 Credits)
This course is repeatable for 72 credits.

ATS 507. SEMINAR. (1 Credit)
One-credit sections. Graded P/N.
This course is repeatable for 48 credits.

ATS 508. WORKSHOP. (0-12 Credits)
May be repeated when topic varies.
This course is repeatable for 12 credits.

ATS 511. THERMODYNAMICS AND CLOUD MICROPHYSICS. (4 Credits)
Thermodynamic processes in the atmosphere, and an introduction to cloud microphysics. Offered annually.
Recommended: MTH 254 and PH 213

ATS 512. ATMOSPHERIC RADIATION. (3 Credits)
Radiative transfer in the earth and planetary atmospheres, absorption and scattering of sunlight, radiation, absorption and emission of terrestrial absorption and scattering cross sections for molecules, cloud droplets and aerosols. Applications include enhancement of photochemical reaction rates in clouds, remote sensing, and the earth's radiation budget, radiative-convective equilibrium, radiative forcing due to changes in atmospheric composition and climate change.
Recommended: MTH 254 and MTH 256 and PH 213

ATS 513. ATMOSPHERIC CHEMISTRY. (3 Credits)
Principles of atmospheric chemistry; chemical fundamentals, sampling principles, sources, reactions, scavenging, and deposition of sulfur, nitrogen, ozone, and carbon compounds. Atmospheric aerosol size distribution, mechanics, optics, and scavenging. Offered annually.
Recommended: (CH 121 or CH 201 or CH 221 or CH 231 or CH 231H or CH 224) and (MTH 251 or MTH 241)

ATS 515. ATMOSPHERIC DYNAMICS. (4 Credits)
Prerequisites: OEAS 530 with C- or better
Recommended: One year of college calculus and physics

ATS 516. ATMOSPHERIC DYNAMICS II. (4 Credits)
Review of basic equations; scale analysis and approximations. Turbulence and boundary layers. Dry and moist convection; convective storms. Frontogenesis; symmetric instability; internal gravity waves and mountain waves; differentially heated circulations including sea breezes. Slope flows and urban circulations. Offered alternate years.
Prerequisites: ATS 515 with C or better
ATS 517. WEATHER SYSTEM DYNAMICS AND FORECASTING. (4 Credits)
Dynamics of weather systems and basic forecasting methods. Mid-latitude storm formation and structure; basic dynamical equations and applications to real-time weather; map analysis; description and interpretation of weather prediction models; forecasting methods; Pacific NW weather. Lec/Lab.
Prerequisites: OEAS 530 with C- or better

ATS 520. PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE. (4 Credits)
Physics of climate past, present and future. Covers radiative processes, thermodynamics, and dynamics, as well as the paleoclimate record and mechanisms driving this variability. Current models of climate variability (e.g., ENSO) will also be surveyed. Climate models, ranging from 0- to 3-dimensional, will be examined and projections for the future assessed.
Recommended: MTH 252 and (PH 202 or PH 202H or PH 212 or PH 212H)

ATS 521. CLIMATE MODELING. (4 Credits)
Numerical models of the physics, chemistry, biology, and geology of the climate system. A range of climate models from a simple, single equation to complex state-of-the-science systems used for future projections. Theoretical concepts will be linked to practical applications through hands-on programming exercises and data analysis. Lec/lab.
Recommended: ATS 420 or ATS 520

ATS 541. NORTHWEST CLIMATE AND WEATHER. (4 Credits)
A survey of climate and weather phenomena that are consequential in the northwestern United States. The Pacific Ocean, the North Pacific jet and storm track, mountain and coastal meteorology, and topographic features like the region's mountains and Columbia River Gorge all affect the climate and weather of the Northwest, which in turn affect the region's hydrologic characteristics, vegetation, and numerous other natural and human systems. Preexisting content knowledge and analytical skills are used to produce a comprehensive written report and oral presentation for a regional stakeholder.
Prerequisites: OEAS 530 with C- or better or ATS 520 with C- or better

ATS 546. EXPERIMENTAL ENERGY AND GAS EXCHANGE. (4 Credits)
Experimental methods to quantify the atmospheric carbon dioxide, water, methane, heat, momentum, and radiative exchange at the vegetation-land-ocean-air interface. Techniques include bulk and gradient approaches, and eddy covariance. The central activity consists of student teams designing and conducting a field experiment, analyzing and interpreting observations, and presenting results. Lec/lab/discussion/activity.
Recommended: ATS 516 [D-] or ATS 564 [D-] or FS 564 [D-]

ATS 564. INTERACTIONS OF VEGETATION AND ATMOSPHERE. (3 Credits)
Quantitative treatment of radiation, heat, mass, and momentum exchange between vegetation and atmosphere; forest, natural and agricultural ecosystem examples. Physical and biological controls of carbon dioxide and water vapor exchange; remote sensing of canopy processes; models of stand-scale evaporation, photosynthesis and respiration; landscape and regional scale exchanges; vegetation and planetary boundary layer coupling; vegetation in global climate models.
Equivalent to: FS 564
Recommended: MTH 251 and PH 201

ATS 575. PLANETARY ATMOSPHERES. (3 Credits)
Origin and evolution of planetary atmospheres; vertical structure of atmospheres; hazes and clouds; atmospheric motions and general circulation. Presentation of recent observations and current research issues, focusing on Venus, Earth, Mars, Jupiter, Saturn, and Titan. Emphasis on comparative aspects and simple models.
Recommended: MTH 254 and PH 213

ATS 590. SPECIAL TOPICS. (0-4 Credits)
May be repeated when topic varies.
This course is repeatable for 12 credits.

ATS 601. RESEARCH. (1-16 Credits)
This course is repeatable for 36 credits.

ATS 603. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

ATS 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ATS 606. PROJECTS. (1-16 Credits)
This course is repeatable for 84 credits.

ATS 607. SEMINAR. (1 Credit)
One-credit sections. Graded P/N.
This course is repeatable for 48 credits.

ATS 608. WORKSHOP. (0-12 Credits)
May be repeated when topic varies.
This course is repeatable for 12 credits.

ATS 615. LARGE-SCALE INTERACTIONS OF THE OCEAN AND ATMOSPHERE. (3 Credits)
Ocean-atmosphere circulations in the time-mean and seasonal cycles, equatorial wave modes, El Nino-Southern Oscillation, Madden-Julian oscillation, teleconnections and atmospheric bridges, mid-latitude air-sea interactions, Pacific and Atlantic decadal variability, the North Atlantic oscillation/Arctic oscillation.
Prerequisites: (ATS 515 with C or better or OC 670 with C or better)
ATS 690. SELECTED TOPICS. (0-4 Credits)
May be repeated for credit when topic varies.
This course is repeatable for 12 credits.

Environmental Sciences

ENSC 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

ENSC 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

ENSC 101. ENVIRONMENTAL SCIENCES ORIENTATION. (1 Credit)
Introduction to the Environmental Sciences Program and related professional and educational opportunities. Recommended for all freshman and first-year transfer environmental sciences majors, but open to all students interested in learning about career options in the environmental sciences. Graded P/N.
ENSC 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ENSC 399H
This course is repeatable for 16 credits.

ENSC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 402. INDEPENDENT STUDIES. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 403. THESIS. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 405. READING AND CONFERENCE. (1-12 Credits)
Equivalent to: ENSC 405H
This course is repeatable for 16 credits.

ENSC 406. PROJECTS. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 407. SEMINAR. (1-16 Credits)
Equivalent to: ENSC 407H
This course is repeatable for 12 credits.

ENSC 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENSC 407
This course is repeatable for 12 credits.

ENSC 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 12 credits.

ENSC 410. ENVIRONMENTAL SCIENCE INTERNSHIP. (1-12 Credits)
Supervised practical experience working with professionals at selected cooperating institutions, agencies, laboratories, or companies. Graded P/ N.
This course is repeatable for 48 credits.

ENSC 452. ENVIRONMENTAL ASSESSMENT. (3 Credits)
Environmental site assessment is a primary tool for environmental science professionals. Apply environmental science concepts to evaluate features of a specific natural area and conduct a land suitability analysis. Create a conceptual site design and management plan that complies with federal, state, and local regulations and environmental laws.
Equivalent to: GEOG 452

ENSC 479. **ENVIRONMENTAL CASE STUDIES. (3 Credits)
Improves students’ ability to ask questions, gather and synthesize information, and communicate ideas on environmental topics. Instruction and information necessary for the course is entirely Web based. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC
Equivalent to: BOT 479
Recommended: One year of college biology or chemistry

ENSC 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 503. THESIS. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 999 credits.

ENSC 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 508. WORKSHOP. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 16 credits.

ENSC 510. INTERNSHIP. (1-12 Credits)
This course is repeatable for 12 credits.

ENSC 515. ENVIRONMENTAL PERSPECTIVES AND METHODS. (3 Credits)
Unique perspective or method each quarter. Possibilities include: remote sensing, modeling over a range of scales in time, space, and levels of system organization; and risk analysis.

ENSC 516. USING BEST PRACTICES IN ENVIRONMENTAL PROJECT MANAGEMENT. (4 Credits)
Explore foundational project management concepts using a real world case-study to practice both soft and hard skills through individual and group assignments, discussions and presentations. Apply best practices, methodologies and tools using a global standards framework to achieve successful outcomes in environmental project management work. Active learning and networking are incorporated throughout the course to provide a full perspective on project management.

ENSC 520. ENVIRONMENTAL ANALYSIS. (3 Credits)
Develop analytical thinking, explore analytical approaches, enhance writing skills, and gain experience in oral communication about environmental issues.

ENSC 540. ENVIRONMENTAL SCIENCE PERSPECTIVES ON THE FUTURE OF FOOD. (4 Credits)
Examines the newest developments in environmental science research and on-the-ground best management practices for achieving food security and sustainability for growing U.S. and global populations in a dynamic environment and climate.

ENSC 541. ENVIRONMENTAL SCIENCE, SCIENTISTS, AND SOUND DECISIONS. (4 Credits)
Focusing on analyzing the role of environmental science and scientists in decision-making in a variety of professional contexts at various scales (local through global) using a case-study approach and proposing a draft model process.

ENSC 542. MANAGEMENT OPPORTUNITIES IN THE NITROGEN CASCADE. (4 Credits)
Analyzes the environmental science behind reducing excess reactive nitrogen entering the environment through our provision of food, power, and transportation for future populations. Identifies emerging complementary suites of interventions and legislation innovating management practices at local, regional, national and international scales.

ENSC 543. EXCELLENT IN AN INTERDISCIPLINARY TEAM. (4 Credits)
Identifying, examining and practicing the top skills, attributes and leadership dynamics involved in working in interdisciplinary environmental science teams in industry, government, and research organizations, informed by experienced experts across these areas.

ENSC 555X. FOOD FOR CHANGE. (3 Credits)
Focusing on traditional regional recipes, explore and document how global change has affected food production and demand until today and how projected climate change will affect it in the future by analyzing the ingredient lists. Focus on one recipe/ingredient, find maps of past/current crop ranges, document changes, and identify possible replacement ingredients projecting future culinary solutions.
Recommended: GEOG 472
ENSC 599. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENSC 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 699. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Geosciences

GEO 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

GEO 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students' understanding of the connection between theory and practice in their respective disciplines.

GEO 100. *NATURAL DISASTERS: HOLLYWOOD VERSUS REALITY. (4 Credits)
Introduction to natural hazards, as seen through the lens of popular media. Course will explore the causes and consequences of natural disasters via in-class exercises and activities designed to develop students' skills in scientific analysis and problem solving. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

GEO 101. *THE SOLID EARTH. (4 Credits)
Solid earth processes and materials. Earthquakes, volcanoes, earth structure, rocks, minerals, ores. Solid earth hazard prediction and planning. Geologic time. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

GEO 199. SPECIAL STUDIES. (1-16 Credits)
Equivalent to: GEO 199H
This course is repeatable for 16 credits.

GEO 201. *PHYSICAL GEOLOGY. (4 Credits)
Study of earth's interior. Tectonic processes and their influence on mountains, volcanoes, earthquakes, minerals, and rocks. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

Equivalent to: GEO 201H

GEO 202. *EARTH SYSTEMS SCIENCE. (4 Credits)
Surficial processes (glaciers, rivers), climate, soils, vegetation, and their interrelationships. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

Equivalent to: GEO 201H, GEO 202H

GEO 203. *EVOLUTION OF PLANET EARTH. (4 Credits)
History of earth and life as interpreted from fossils and the rock record. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

GEO 221. *ENVIRONMENTAL GEOLOGY. (4 Credits)
Introductory geology emphasizing geologic hazards (volcanoes, earthquakes, landslides, flooding), geologic resources (water, soil, air, mineral, energy), and associated environmental problems and mitigation strategies. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

GEO 295. INTRODUCTION TO FIELD GEOLOGY. (3 Credits)
Two-week course taught in the fall program in various locations throughout the west. Collect field data to make geological maps, cross-sections, columns, and reports. Serves as an introduction to upper-level course work for Geology degree. Lec/lab.

Prerequisites: GEO 201 with C- or better

GEO 305. *LIVING WITH ACTIVE CASCADE VOLCANOES. (3 Credits)
The impact of volcanic activity on people, infrastructure, and natural resources; how and why volcanic activity in the Cascade Range occurs; volcano monitoring and hazard assessment. Field trip required, transportation fee charged. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 306. *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT. (3 Credits)
Geologic occurrences, environmental consequences, and future of non-renewable earth resources, including metals, materials, oil, soil, and groundwater. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 307. *NATIONAL PARK GEOLOGY AND PRESERVATION. (3 Credits)
National parks as classrooms to study geological processes and the importance of preserving natural landscapes. Field trip(s) required; transportation fee charged. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society

Equivalent to: GEO 307H

GEO 307H. *NATIONAL PARK GEOLOGY AND PRESERVATION. (3 Credits)
National parks as classrooms to study geological processes and the importance of preserving natural landscapes. Field trip(s) required; transportation fee charged. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator

Equivalent to: GEO 307

GEO 308. *GLOBAL CHANGE AND EARTH SCIENCES. (3 Credits)
Study of global change over different time scales during the history of the earth, with emphasis on evolution of its atmosphere, plate tectonics, paleoclimates, and mass extinctions. (Bacc Core Course)

Attributes: CSGI – Core, Synth, Global Issues

GEO 309. *ENVIRONMENTAL JUSTICE. (3 Credits)
Technical and social issues surrounding the unequal exposure to environmental hazards based on race and the environmental justice movement that has grown to address charges of such environmental racism. (Bacc Core Course)

Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

Prerequisites: WR 121 with C- or better or WR 121H with C- or better
GEO 310. EARTH MATERIALS I: MINERALOGY. (4 Credits)
Principles of crystal morphology, and structure. Characteristics, identification, and origins of minerals. Lec/lab.
Prerequisites: (GEO 201 with D- or better or GEO 221 with D- or better) and ((CH 121 with D- or better or (CH 231 with D- or better and CH 261 [D-]) or (CH 231H [D-] and CH 261H [D-])))

GEO 315. EARTH MATERIALS II: PETROLOGY. (4 Credits)
Origin, identification and classification of igneous, sedimentary, and metamorphic rocks. Field trip(s) required, transportation fee charged. Lec/lab.
Prerequisites: GEO 310 with D- or better

GEO 322. SURFACE PROCESSES. (4 Credits)
Examination of surficial processes and terrestrial landforms of the earth, including slopes, rivers, glaciers, deserts, and coastlines. Field trip(s) required; transportation fee charged. Lec/lab.
Prerequisites: (GEO 102 with D- or better or GEO 102H with D- or better or GEO 202 with D- or better) and (MTH 251 [C-] or MTH 251H [C-]) and (PH 201 [D-] or PH 211 [D-] or PH 211H [D-])

GEO 331. *ASTROBIOLOGY: LIFE BEYOND EARTH. (3 Credits)
Evaluates the potential distribution of life in the Universe, presents the science and technology used to search for life, and explores the societal impacts of its discovery.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Completion of 12 credits of biological and physical science in the Bacc Core

GEO 340. STRUCTURAL GEOLOGY. (4 Credits)
Analysis of geometry and kinematics of geologic structures including brittle and ductile faults, folds, joints, deformation fabrics. Field trip(s) required; transportation fee charged. Lec/lab.
Prerequisites: GEO 201 with D- or better
Equivalent to: GEO 450

GEO 352. *OREGON: GEOLOGY, PLACE, AND LIFE ON THE RING OF FIRE. (4 Credits)
Provides an overview of the geology of Oregon in the context of the Pacific Northwest including tectonic setting, geologic features and landscapes, as well as topics and concepts of interest to society in general. Lessons will include discussion of the relationship between people and the landscape, incorporating the concept of ethnographic landscapes–geologic structures, natural resources and geologic hazards that are part of the identity of a place. Emphasizes written and graphic communication skills. Field trip required, transportation fee charged. Lec/lab. (Bacc core course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: GEO 352H

GEO 352H. *OREGON: GEOLOGY, PLACE, AND LIFE ON THE RING OF FIRE. (4 Credits)
Provides an overview of the geology of Oregon in the context of the Pacific Northwest including tectonic setting, geologic features and landscapes, as well as topics and concepts of interest to society in general. Lessons will include discussion of the relationship between people and the landscape, incorporating the concept of ethnographic landscapes–geologic structures, natural resources and geologic hazards that are part of the identity of a place. Emphasizes written and graphic communication skills. Field trip required, transportation fee charged. Lec/lab. (Bacc core course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: GEO 352

GEO 370. STRATIGRAPHY AND SEDIMENTOLOGY. (4 Credits)
Basic principles of sedimentology and stratigraphy. Sedimentology is largely concerned with classifying and interpreting the origin of sedimentary rocks. Stratigraphy provides formal rules and strategies for organizing sedimentary (and other) rocks into a temporal framework. Reconstruction of Earth history with various approaches centered on paleoclimatology, paleogeography, paleooceanography, and tectonics. Lec/lab.
Prerequisites: GEO 201 with C- or better and GEO 203 [C-]
Equivalent to: GEO 470

GEO 380. *EARTHQUAKES IN THE PACIFIC NORTHWEST. (3 Credits)
Earthquake hazards in the Northwest; responses to reducing earthquake risk at state, local, and personal levels. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
GEO 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

GEO 400. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged. Graded P/N.
This course is repeatable for 48 credits.

GEO 401. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged. This course is repeatable for 24 credits.

GEO 403. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged. This course is repeatable for 24 credits.

GEO 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: GEO 407H
This course is repeatable for 12 credits.

GEO 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: GEO 407
This course is repeatable for 12 credits.

GEO 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 12 credits.

GEO 410. INTERNSHIP. (1-15 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 48 credits.
GEO 412. IGNEOUS PETROLOGY. (4 Credits)
Petrogenesis of igneous rocks. Petrographic analysis using polarizing microscopes. Field trip may be required, transportation fee charged. Lec/lab.
Prerequisites: GEO 315 with D- or better
Recommended: GEO 415 [C-]

GEO 415. EARTH MATERIALS III: PETROGRAPHY. (4 Credits)
Microscope-based study of minerals and igneous, sedimentary and metamorphic rocks. Representation and interpretation of geological processes based on microscopic observation. Lec/lab.
Prerequisites: GEO 201 with D- or better and GEO 310 [D-] and GEO 315 [D-]
Equivalent to: GEO 320

GEO 427. VOLCANOLOGY. (4 Credits)
A survey of volcanoes: their distribution, forms, composition, eruptive products, eruptive styles, and associated phenomena. Field trip may be required; transportation fee charged. Offered alternate years. Lec/lab.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GEO 315 with D- or better

GEO 430. GEOCHEMISTRY. (4 Credits)
Principles of geochemistry applied to problems of earth science. Field trip(s) may be required; transportation fee charged. Lec/rec.
Prerequisites: GEO 315 (may be taken concurrently) with D- or better and ((CH 121 with D- or better and CH 122 [D-]) or ((CH 231 [D-] or CH 231H [D-]) and (CH 261 [D-] or CH 261H [D-]) and (CH 232 [D-] or CH 232H [D-]) and (CH 262 [D-] or CH 262H [D-])

GEO 431. ENVIRONMENTAL GEOCHEMISTRY. (3 Credits)
An introduction to natural processes at and near the earth’s surface, as well as an examination of the impact of human activities on the natural environment. Study includes discussion of the sources, transformations, transport, and fate of contaminants. Field trip(s) required; transportation fee charge.
Prerequisites: (CH 121 with D- or better and CH 122 [D-] and CH 123 [D-]) or ((CH 231 [D-] or CH 231H [D-]) and (CH 232 [D-] or CH 232H [D-]) and (CH 233 [D-] or CH 233H [D-]))

GEO 432. APPLIED GEOMORPHOLOGY. (3 Credits)
Effect of landform processes upon human activity; consequences of resource management strategies on erosional balance within landscape; identification of mitigation of natural hazards; role of geomorphic process studies in environmental planning. Taught as seminar; themes TBA. Field trip(s) may be required; transportation fee charged.
Equivalent to: GEO 449
Recommended: GEO 322

GEO 433. COASTAL GEOMORPHOLOGY. (3 Credits)
Morphodynamic approach to coastal landforms, processes and evolution including the impacts and response of humans to coastal change.
Prerequisites: (PH 211 with D- or better or PH 211H with D- or better) and (PH 212 [D-] or PH 212H [D-]) and GEO 322 [D-]
Recommended: MTH 251 [D-] and MTH 252 [D-]

GEO 440. ECONOMIC GEOLOGY. (4 Credits)
Principles of the origin, distribution, and importance of metallic mineral deposits formed by magmatic, hydrothermal, and sedimentary processes. Lec/lab.
Prerequisites: GEO 315 with D- or better
Recommended: GEO 340 [C-]

GEO 461. GEOLOGY OF EARTHQUAKES. (3 Credits)
Tectonics of the present day as based on surface geology, geodesy, seismicity, and crustal structure; description of active faults and folds; use of neotectonics in evaluation of earthquake hazard. Field trip(s) may be required; transportation fee charged. Offered alternate years.
Prerequisites: GEO 340 with D- or better

GEO 463. GEOPHYSICS AND TECTONICS. (4 Credits)
Geophysical observations as constraints on geologic interpretation. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: GPH 463
Recommended: MTH 251 [D-] and (PH 202 [D-] or PH 212 [D-])

GEO 481. GLACIAL GEOLOGY. (4 Credits)
Mass balance of glaciers, physics of glacial flow, processes of glacial erosion and deposition, glacial meltwater, glacial isotasy and eustasy, and Quaternary stratigraphy. Field trip(s) may be required; transportation fee charged. Lec/lab. Offered alternate years.
Recommended: GEO 202 [C-]

GEO 484. INTRODUCTION TO BIOGEOCHEMISTRY. (3 Credits)
Interdisciplinary course, applying concepts from chemistry, physics, biology and geology to Earth systems including terrestrial, ocean and freshwater environments; water and energy cycles; carbon, nitrogen, phosphorus and sulfur cycles; biogeochemical cycles through Earth history.
Prerequisites: MTH 111 with D- or better and ((CH 121 with D- or better and CH 122 [D-]) or (CH 231 [D-] and CH 261 [D-] and CH 232 [D-] and (CH 262 [D-] or CH 262H [D-]))

GEO 486. QUATERNARY PALEOCLIMATOLOGY. (3 Credits)
Introduction to geochronology, climate proxies, climate forcing, and climate modeling applied to paleoclimate problems. Emphasis on Quaternary climate history.
Prerequisites: (GEO 202 with D- or better or GEO 203 with D- or better) and ((CH 231 [D-] or CH 222 [D-]) or ((CH 232 [D-] or CH 232H [D-]) and (CH 262 [D-] or CH 262H [D-] or CH 272 [D-]))

GEO 487. HYDROGEOLOGY. (4 Credits)
Prerequisites: MTH 252 with D- or better or MTH 252H with D- or better

GEO 488. QUATERNARY STRATIGRAPHY OF NORTH AMERICA. (3 Credits)
Stratigraphic principles applied to Quaternary deposits. Survey Quaternary dating methods. Proxy records of glaciation and climate change. Quaternary stratigraphy of North America, emphasizing stratigraphic records of ice sheets, glaciers, and pluvial lakes. Offered alternate years.
Recommended: GEO 481 or GEO 581

GEO 495. ADVANCED FIELD GEOLOGY. (6 Credits)
Six-week summer program in central Oregon. Collect field data to make geological maps, cross-sections, columns, and reports. Fee charged.
Prerequisites: GEO 295 with C- or better and GEO 315 [C-] and GEO 340 [C-] and GEO 370 [C-]
GEO 497. FIELD MAPPING OF ORE DEPOSITS. (3 Credits)
Eight-day field trip over spring vacation to a mineral district in the western United States, emphasizing detailed mapping of outcrops, trenches, and underground workings. Students prepare final maps and a report suitable for presentation to management or publication during spring term. Transportation fee charged. Not offered every year.
Recommended: GEO 440 [C-] and GEO 495 [C-]
GEO 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: GEO 499H
This course is repeatable for 16 credits.
GEO 500. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged. Graded P/N.
This course is repeatable for 48 credits.
GEO 501. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.
GEO 503. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged.
This course is repeatable for 999 credits.
GEO 505. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.
GEO 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 48 credits.
GEO 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.
GEO 510. INTERNSHIP. (1-15 Credits)
Pre-career professional experience under joint faculty and employer supervision. May not be used to meet minimum credit hour requirements for graduate degrees in geosciences. Graded P/N.
This course is repeatable for 16 credits.
GEO 512. IGNEOUS PETROLOGY. (4 Credits)
Petrogenesis of igneous rocks. Petrographic analysis using polarizing microscopes. Field trip may be required, transportation fee charged. Lec/lab.
GEO 516. INTERPRETATION OF GEOLOGIC MAPS. (3 Credits)
Development of skills in formulating geologic problems, using geologic maps, and developing solutions by the scientific method.
GEO 518. GEOSCIENCE COMMUNICATION. (3 Credits)
Professional development of the skills of technical editing and writing for geoscientists. Practice the craft of presentation development and delivery, and the broader issues of problem development, and manuscript and proposal writing specific to geoscience graduate students.
GEO 527. VOLCANOLOGY. (4 Credits)
A survey of volcanoes: their distribution, forms, composition, eruptive products, eruptive styles, and associated phenomena. Field trip may be required; transportation fee charged. Offered alternate years. Lec/lab.
GEO 530. GEOCHEMISTRY. (4 Credits)
Principles of geochemistry applied to problems of earth science. Field trip(s) may be required; transportation fees charged. Lec/rec.
GEO 531. ENVIRONMENTAL GEOCHEMISTRY. (3 Credits)
An introduction to natural processes at and near the earth’s surface, as well as an examination of the impact of human activities on the natural environment. Study includes discussion of the sources, transformations, transport, and fate of contaminants. Field trip(s) required; transportation fee charged.
GEO 532. APPLIED GEOMORPHOLOGY. (3 Credits)
Effect of landform processes upon human activity; consequences of resource management strategies on erosional balance within landscape; identification of mitigation of natural hazards; role of geomorphic process studies in environmental planning. Taught as seminar, themes TBA. Field trip(s) may be required; transportation fee charged.
Equivalent to: GEOG 549
GEO 533. COASTAL GEOMORPHOLOGY. (3 Credits)
Morphodynamic approach to coastal landforms, processes and evolution including the impacts and response of humans to coastal change.
GEO 535. GEOCHEMICAL ANALYSIS TECHNIQUES. (3 Credits)
An introduction to the theory, techniques and instrumentation used for the chemical analysis of earth materials, with emphasis on analysis of solid earth material samples (predominantly, but not restricted to, rocks). Includes discussions of laboratory safety, relevant statistical approaches, basic physical and chemical principles of analysis, sample preparation techniques and data processing and reporting. Course also includes a large component of hands-on experience with instrumentation available in-house in the College of Earth, Ocean, and Atmospheric Sciences. Lec/lab.
Prerequisites: GEO 530 with C or better
GEO 536. STRUCTURAL AND NEOTECTONIC FIELD METHODS. (3 Credits)
Field-intensive mapping experience emphasizing a topical issue in active tectonics, neotectonics, earthquake geology, or structural geology. One-week field trip required; transportation fee charged. Weekly discussions during quarter. Offered alternate years.
GEO 537. TECTONIC GEOMORPHOLOGY. (3 Credits)
Exploration of linkages between patterns of erosion, crustal deformation, and landscape evolution from geomorphic, geologic, geophysical, and modeling perspectives. Field trip required; transportation fee charged. Offered alternate years.
GEO 540. ECONOMIC GEOLOGY. (4 Credits)
Principles of the origin, distribution, and importance of metallic mineral deposits formed by magmatic, hydrothermal, and sedimentary processes. Lec/lab.
GEO 550. COASTAL HAZARDS: PROCESSES, RESPONSE, AND ADAPTATION. (3 Credits)
Coastal hazards and the associated risks they pose to rapidly expanding coastal communities. Examination of coastal hazards from a transdisciplinary perspective including the physical processes, the coastal response, and coastal adaptation/management options for dealing with the hazards. Emphasizes probabilistic and other user-inspired approaches for assessing coastal vulnerability to the various hazards.
GEO 561. GEOLOGY OF EARTHQUAKES. (3 Credits)
Tectonics of the present day as based on surface geology, geodesy, seismicity, and crustal structure; description of active faults and folds; use of neotectonics in evaluation of earthquake hazard. Field trip(s) may be required; transportation fee charged. Offered alternate years.
GEO 563. GEOPHYSICS AND TECTONICS. (4 Credits)
Geophysical observations as constraints on geologic interpretation. Lec/lab.
Equivalent to: GPH 563
GEO 581. GLACIAL GEOLOGY. (4 Credits)
Mass balance of glaciers, physics of glacial flow, processes of glacial erosion and deposition, glacial meltwater, glacial isotasy and eustasy, and Quaternary stratigraphy. Field trip(s) may be required; transportation fee charged. Lec/lab. Offered alternate years.

GEO 586. QUATERNARY PALEOClimATOLOGY. (3 Credits)
Introduction to geochronology, climate proxies, climate forcing, and climate modeling applied to paleoclimate problems. Emphasis on Quaternary climate history.

GEO 588. QUATERNARY STRATIGRAPHY OF NORTH AMERICA. (3 Credits)
Stratigraphic principles applied to Quaternary deposits. Survey Quaternary dating methods. Proxy records of glaciation and climate change. Quaternary stratigraphy of North America, emphasizing stratigraphic records of ice sheets, glaciers, and pluvial lakes. Offered alternate years.

GEO 597. FIELD MAPPING OF ORE DEPOSITS. (3 Credits)
Eight-day field trip over spring vacation to a mineral district in the western United States, emphasizing detailed mapping of outcrops, trenches, and underground workings. Students prepare final maps and a report suitable for presentation to management or publication during spring term. Transportation fee charged. Not offered every year.

Recommended: GEO 440 [C-] or GEO 540 [C-]

GEO 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 24 credits.

GEO 600. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not part of any other course. Transportation fee charged. Students may prepare guide for trips. Faculty sponsors must be arranged. Graded P/N.
This course is repeatable for 84 credits.

GEO 601. RESEARCH. (1-16 Credits)
This course is repeatable for 36 credits.

GEO 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

GEO 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

GEO 606. PROJECTS. (1-16 Credits)
This course is repeatable for 84 credits.

GEO 607. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 48 credits.

GEO 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

GEO 622. IGNEOUS PETROLOGY. (3 Credits)
Controls on the distribution of major and trace elements; theory, applications, and examples. Field trip(s) may be required; transportation fee charged. Offered alternate years.
Recommended: GEO 412 [C-] or GEO 512 [C-]

GEO 633. GEOCHRONOLOGY AND ISOTOPE GEOLOGY. (3 Credits)
Measurements of cosmic and geologic time by radioactive decay. Use of radiogenic and stable isotopic tracers in geology. Offered alternate years.
Equivalent to: OC 633

GEO 666. STABLE ISOTOPE GEOCHEMISTRY. (3 Credits)
Study of the principles governing terrestrial stable isotope distributions, with application to geologic, oceanographic, atmospheric and planetary processes. The primary focus is on isotopes of the light elements such as oxygen, hydrogen, carbon and sulfur, but may include other isotope systems, including Sr/Nd isotopes as geochemical tracers, noble gases, and metal isotopes (eg. Mo, Cu, Fe).

GEO 684. GLOBAL BIOGEOCHEMICAL CYCLES. (4 Credits)
An in-depth treatment of global biogeochemical cycles, focusing on cycles of carbon, oxygen, nitrogen, phosphorus, and sulfur in the atmosphere, hydrosphere, and lithosphere. CROSSLISTED as GEO 684/SOIL 684
Equivalent to: SOIL 684

GEO 691. MASS AND HEAT TRANSPORT IN THE ENVIRONMENT. (4 Credits)
Quantitative treatment of processes affecting transport in lakes, streams, and groundwater: advection; diffusion; dispersion. Lec/lab. Offered alternate years.

GEO 694. TOPICS IN ORE GENESIS. (1-3 Credits)
In-depth examination of published research on selected mineral deposits to build an understanding of environments and processes of ore formation. Offered alternate years.
This course is repeatable for 6 credits.

GEO 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

Geography

GEOG 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

GEOG 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

GEOG 100. *CLIMATE JUSTICE. (3 Credits)
Unequal distribution of social, economic and political power that creates winners and losers from climate change. Case studies of climate-change-related environmental degradation, conflict, conservation, climate denial, renewable energy, and investment. Concepts and actions to promote climate justice. Lec/rec. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

GEOG 102. *PHYSICAL GEOGRAPHY. (4 Credits)
Processes that shape the earth’s surface. Weathering, mass movement, landforms, river systems, groundwater, biogeochemistry, human effects on the landscape. Use of maps and imagery. (Bacc Core Course)
Attributes: CPPPS – Core, Pers, Physical Science
Equivalent to: GEO 102

GEOG 103. *HUMAN GEOGRAPHY. (3 Credits)
Introduction to how human activity affects or is influenced by the earth’s surface, including languages, religions, migration, development, and resources. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
GEOG 250. *GEOGRAPHY OF LATIN AMERICA. (3 Credits)
Introduction to the geographic concepts and processes for effective disaster management, including response, recovery, mitigation and preparedness. Risk assessment and evidence-based best practices to prepare and respond to emergencies in a variety of geographic contexts. (Bacc Core Course) Equivalent course is GEO 205.
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: GEO 205

GEOG 295. INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH. (3 Credits)
Introduction to field research in geography. Practice skills including observation, posing of questions, and collection and analysis of data. Focus on theory-based geographic study design, proposal development, and research critiques.
Equivalent to: GEO 296
Recommended: GEOG 102 or GEOG 103 or GEOG 201 or GEOG 203

GEOG 299. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 300. *SUSTAINABILITY FOR THE COMMON GOOD. (3 Credits)
Geography of human relationships to the earth’s systems with an emphasis on individual impacts and collective efforts to achieve environmental sustainability. (Bacc Core Course) Equivalent course is GEO 300, GEO 300H
Attributes: CPSD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core

GEOG 300H. *SUSTAINABILITY FOR THE COMMON GOOD. (3 Credits)
Geography of human relationships to the earth’s systems with an emphasis on individual impacts and collective efforts to achieve environmental sustainability. (Bacc Core Course) Equivalent course is GEO 300, GEO 300H
Attributes: CPSD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core

GEOG 301. *FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS. (4 Credits)
Basic physical science principles underlying geospatial technologies such as GPS, mobile devices, and online mapping and navigation tools used in GIS, remote sensing, and geovisualization. Concepts and applications in government, business, and the environment. (Bacc Core Course) Equivalent course is GEO 301.
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: GEO 301

GEOG 302. *GEOGRAPHY OF AFRICA. (3 Credits)
Geographic analysis of Africa south of the Sahara. (NC) (Bacc Core Course) Equivalent course is GEO 325.
Attributes: CPSD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: GEO 325

GEOG 303. *GEOGRAPHY OF ASIA. (3 Credits)
Geographic analysis of Asia’s lands and peoples. Emphasis on regional physical environments, resources and development geographies of the regions of Asia. Offered every other year. (NC) (Bacc Core Course) Equivalent course is GEO 327.
Attributes: CPSD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: GEO 327

GEOG 304. *GEOGRAPHY OF THE WESTERN WORLD. (3 Credits)
An introduction to the rich variety of environments, population and settlement dynamics, cultures, geopolitical changes, and economies in Europe and Russia, Australia and Oceania, and the Americas. Lec/rec. (SS) (Bacc Core Course) Equivalent course is GEO 106.
Attributes: CPWC – Core, Pers, West Culture; LACS – Liberal Arts Social Core
Equivalent to: GEO 106

GEOG 305. INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH. (3 Credits)
Introduction to field research in geography. Practice skills including observation, posing of questions, and collection and analysis of data. Focus on theory-based geographic study design, proposal development, and research critiques.
Equivalent to: GEO 296
Recommended: GEOG 102 or GEOG 103 or GEOG 201 or GEOG 203

GEOG 309. *CLIMATOLOGY. (4 Credits)
Systematic analysis of global and regional climates. Physical principles of climate, climate classifications, and distribution and characteristics of climate regimes. Lec/lab. (Writing Intensive Course) Attributes: CWIC – Core, Skills, WIC
Prerequisites: GEOG 102 with D- or better or GEOG 202 with D- or better or GEOG 102 with D- or better
Equivalent to: GEO 323
GEOG 324. *ECOLOGICAL BIOGEOGRAPHY. (4 Credits)
Spatial distributions and change over time of species, communities, and biomes. Effect of climate, tectonics, disturbance on evolution, extinction, and succession. Implications for conservation. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GEOG 102 with D- or better or (BI 370 with C- or better or BI 370H with C- or better)
Equivalent to: GEO 324

GEOG 330. **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION. (3 Credits)
Introduction to the geography of global wealth and inequality with a focus on contemporary development, underdevelopment, and globalization problems in Asian, African, Caribbean, Latin American, and Pacific Island countries. (Bacc Core Course) (Writing Intensive Course) Equivalent course is GEO 330.
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC
Equivalent to: GEO 330
Recommended: GEOG 105 or GEO 105H or GEO 105 or GEO 106

GEOG 331. *POPULATION, CONSUMPTION, AND ENVIRONMENT. (3 Credits)
An examination of population patterns and trends, emphasizing historical growth and more recent demographic changes; using geographic tools to understand patterns of spatial distribution, to use and analyze data sources, and to gain experience interpreting and displaying data about population structure and dynamics; and developing the ability to evaluate the relationship between population, consumption, resources, and quality of life. Patterns of consumption, as individuals and societies will be examined and different future scenarios will be examined with reference to environmental, social and economic sustainability. (Bacc Core Course) Equivalent course is GEO 350.
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: GEO 350

GEOG 340. *INTRODUCTION TO WATER SCIENCE AND POLICY. (3 Credits)
Policy and science of the hydrologic cycle. Emphasis on interaction between water's natural time-space fluctuations and human uses. (Bacc Core Course) Equivalent course is GEO 335 and SOIL 335.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: CSS 335, CSS 335H, GEO 335, GEO 335H, GEOG 340H, SOIL 335

GEOG 340H. *INTRODUCTION TO WATER SCIENCE AND POLICY. (3 Credits)
Policy and science of the hydrologic cycle. Emphasis on interaction between water's natural time-space fluctuations and human uses. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: CSS 335, CSS 335H, GEO 335, GEO 335H, GEOG 340, SOIL 335

GEOG 350. *GEOGRAPHY OF NATURAL HAZARDS. (3 Credits)
Introduction to the geography of risk, natural hazards, and disasters, focusing on concepts of vulnerability, adaptation and resilience of human society in the Pacific Northwest and globally. Equivalent course is GEO 304.
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: GEO 304

GEOG 360. GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY. (4 Credits)
Fundamentals of spatial data, geographic information systems (GIS), and introductory spatial analysis, programming, and modeling. Equivalent course is GEO 365 and GEO 465.
Equivalent to: GEO 365

GEOG 361. GISCIENCE II: ANALYSIS AND APPLICATIONS. (4 Credits)
Applications-based course. Development and conduct of geospatial analyses using various spatial data structures, techniques and models. Students acquire, clean, integrate, manipulate, visualize and analyze geospatial data through laboratory work. Lec/lab. Equivalent course is GEO 480.
Prerequisites: GEOG 360 with C- or better and MTH 112 [C-] and (ST 201 [C-] or ST 351 [C-])
Equivalent to: GEO 480

GEOG 370. GEOVISUALIZATION: CARTOGRAPHY. (4 Credits)
Basic cartographic principles. Design, compilation, and construction of maps. Equivalent course is GEO 360.
Prerequisites: GEOG 201 with D- or better or GEO 301 with D- or better
Equivalent to: GEO 360

GEOG 371. GEOVISUALIZATION: WEB MAPPING. (4 Credits)
Current developments in Internet mapping and advanced cartographic skills applied to web-based maps. Techniques of Internet mapping and principles of web-based cartography, including multimedia, animation, 3D visualization, and user interface design. Lec/lab.
Prerequisites: GEOG 201 with D- or better or GEO 301 with D- or better

GEOG 390. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 399H. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 400. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged.
This course is repeatable for 48 credits.

GEOG 401. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.

GEOG 403. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.

GEOG 405. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.

GEOG 407. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

GEOG 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
GEOG 410. INTERNSHIP. (1-16 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 16 credits.
Recommended: 12 credits of upper-division geography

GEOG 423. SNOW HYDROLOGY. (3 Credits)
Fundamentals of snow hydrology. Physical principles of snow formation, snowpack accumulation, energy balance, snowcover-climate interactions, snow metamorphism, snowpack ablation, snowpack/snowmelt chemistry, remote sensing of snow, avalanches, field methods, snowmelt/runoff modeling techniques, and watershed processes. Equivalent course is GEO 483.
Equivalent to: GEO 483

GEOG 424. HYDROLOGY FOR WATER RESOURCES MANAGEMENT. (3 Credits)
A quantitative introduction to surface and subsurface hydrology with a focus on decision making for the water resource professional.
Prerequisites: MTH 251 with C- or better

GEOG 430. RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT. (3 Credits)
Causes and consequences of conflict over natural resource management at local to global scales; principles for managing social-ecological systems for resilience. Field trip(s) may be required, transportation fee charged. Equivalent course is GEO 420.
Equivalent to: GEO 420

GEOG 431. GLOBAL RESOURCES AND DEVELOPMENT. (3 Credits)
Examines resource development issues and strategies in the Global South. Issues and strategies from agriculture, forestry, fisheries, energy, wildlife management, mineral development, land use, and health are examined. Equivalent course is GEO 426.
Equivalent to: GEO 426

GEOG 432. *GEOGRAPHY OF FOOD AND AGRICULTURE. (3 Credits)
Overview of food and agriculture in relation to production and consumption regions as a basis for distinguishing different types of food and agricultural systems. Local and global examination of the geographic aspects of breeding, location in agricultural systems, and adaptation in agro-ecosystems using field study, explorations of literature, and lecture. Field trip required, transportation fee charged. (Bacc Core Course) Equivalent course is GEO 449.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: GEO 449

GEOG 433. CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY. (3 Credits)
Climate change poses challenges for human security and well-being, and for social and economic development. Evaluate how climate change impacts vary based on vulnerability, exposure, sensitivity, adaptive capacity, and risk.
Prerequisites: ATS 201 with C- or better or GEOG 240 with C- or better or GEOG 323 with C- or better

GEOG 440. WATER RESOURCES MANAGEMENT IN THE UNITED STATES. (3 Credits)
An investigation of the various approaches to water resources geography within the U.S. Explores the disciplines that address water resources management, their tools, and their limitations. Topics include engineering, law, economics, risk assessment, game theory, conflict resolution, and the fine arts. Equivalent course is GEO 425.
Equivalent to: GEO 425
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 441. INTERNATIONAL WATER RESOURCES MANAGEMENT. (3 Credits)
An investigation of the various approaches to water resources geography at the international level. Explores the interaction between water science and policy through issues of current ‘hydropolitics’ and water resources development. Topics include water quality, dams and development, conflict and cooperation, climate change, and water institutions. Equivalent course is GEO 424.
Equivalent to: GEO 424
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 450. LAND USE IN THE AMERICAN WEST. (3 Credits)
Development of a conceptual framework for land use study; analysis of land as a resource, land use trends, land use principles, and management issues as related to planning, focusing on the American West, the fastest growing region in the nation. Equivalent course is GEO 423.
Equivalent to: GEO 423

GEOG 451. PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES. (4 Credits)
Applies GIS skills and techniques to determine and analyze future land uses. Determine suitable land uses that incorporate community goals, site constraints and minimize use conflicts. Regulatory and market-based implementation strategies for land uses will also be discussed. Lec/lab. Equivalent course is GEO 452.
Prerequisites: GEOG 360 with C- or better or GEOG 560 with C- or better or GEO 365 with C- or better or GEO 465 with C- or better
Equivalent to: GEO 452

GEOG 452. SUSTAINABLE SITE PLANNING. (3 Credits)
Use of geographic concepts and techniques in site planning to create sustainable management reports for local sites. Inventory of environmental characteristics and human uses, conceptual design for future uses of the site, principles of green infrastructure and sustainable building practices. Local field trip required, transportation fee charged.
Equivalent to: ENSC 452, GEO 451
Recommended: GEOG 250

GEOG 456. GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS. (4 Credits)
Introduction to the extension of geographic information systems (GIS) through programming. No prior programming experience is expected. Teaches a pragmatic approach to design and write programs for geospatial analysis. Equivalent course is GEO 578.
Prerequisites: GEOG 361 with C- or better or GEOG 561 with C- or better or GEO 480 with C- or better
Equivalent to: GEO 578

GEOG 463. GISCIENCE IV: SPATIAL MODELING. (4 Credits)
Introduction to spatial simulation models representing attraction, segregation, individual entities, and processes of spread, applied to contemporary problems in human and physical geography.
Prerequisites: GEOG 462 with C- or better or GEOG 562 with C- or better or GEO 578 with C- or better
GEOG 464. GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS. (3 Credits)
Applications and implications of geospatial science (GIS, remote sensing, and spatial analysis) in intelligence, human, environmental, and ethical domains. Concepts and practices of ethics in geospatial science, including data access, management, visualization, and decision-making. Equivalent course is GEO 567.
Prerequisites: GEOG 360 with C- or better or GEOG 560 with C- or better or GEO 365 with C- or better or GEO 465 with C- or better
Equivalent to: GEO 567
Recommended: Senior standing

GEOG 472. GEOVISUALIZATION: GEOVISUAL ANALYTICS. (3 Credits)
Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages. Lec/lab. Equivalent course is GEO 445.
Prerequisites: GEOG 370 with C- or better or GEOG 371 with C- or better or GEO 360 with C- or better
Equivalent to: GEO 445

GEOG 480. REMOTE SENSING I: PRINCIPLES AND APPLICATIONS. (4 Credits)
Fundamentals of satellite remote sensing and image analysis. Topics include physical principles of remote sensing from the ultraviolet to the microwave, sensors and sensor technology, and environmental applications of remote sensing through image analysis. Lec/lab. Equivalent course is GEO 444.
Prerequisites: GEOG 201 with C- or better or GEO 301 with C- or better
Equivalent to: GEO 444

GEOG 481. REMOTE SENSING II: DIGITAL IMAGE PROCESSING. (4 Credits)
Digital analysis of remote sensor data. Image display enhancement, classification, and rectification principles. Practical experience with an image processing system. Equivalent course is GEO 466.
Prerequisites: GEOG 480 with C- or better or GEOG 580 with C- or better or GEO 444 with C- or better or GEO 544 with C- or better and (ST 202 [D-] or ST 352 [D-])
Equivalent to: GEO 466

GEOG 495. FIELD GEOGRAPHY SYNTHESIS. (3 Credits)
Explore how geographers use field work to investigate landscapes such as mountains, forests, coasts, tundra and desert to understand how they were formed and explain how they have changed over time. Learn techniques for finding out how landscape processes impact humans and, in turn, how humans impact the environment around them. Apply geographic theories and concepts to synthesize, analyze and interpret the relationship between human communities and the environment through the planning and execution of field work.
Prerequisites: GEOG 295 with C- or better or GEO 295 with C- or better
Equivalent to: GEO 435
Recommended: Junior or senior standing

GEOG 499. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 500. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee charged. Students may prepare guides for trips. Faculty sponsor must be prearranged.
This course is repeatable for 48 credits.

GEOG 501. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.

GEOG 503. THESIS. (1-16 Credits)
Independent, original study that culminates in a thesis. Faculty sponsor must be prearranged.
This course is repeatable for 999 credits.

GEOG 505. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.

GEOG 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 510. INTERNSHIP. (1-15 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 16 credits.

GEOG 511. HISTORY AND PHILOSOPHY OF GEOGRAPHY. (3 Credits)
The historical development of research traditions in the discipline of geography. This includes an examination of changes in conceptual structures and current trends. Equivalent course is GEO 515.
Equivalent to: GEO 515

GEOG 512. SOCIAL-ECOLOGICAL SYSTEMS. (3 Credits)
Exploration of critical debates surrounding theories associated with social-ecological systems, resilience, vulnerability, adaptation, social learning, transformation, adaptive governance. Equivalent course is GEO 554.
Equivalent to: GEO 554
Recommended: 9 credits of graduate study.

GEOG 523. SNOW HYDROLOGY. (3 Credits)
Fundamentals of snow hydrology. Physical principles of snow formation, snowpack accumulation, energy balance, snowcover-climate interactions, snow metamorphism, snowpack ablation, snowpack/snowmelt chemistry, remote sensing of snow, avalanches, field methods, snowmelt/ runoff modeling techniques, and watershed processes. Equivalent course is GEO 583.
Equivalent to: GEO 583

GEOG 524. HYDROLOGY FOR WATER RESOURCES MANAGEMENT. (3 Credits)
A quantitative introduction to surface and subsurface hydrology with a focus on decision making for the water resource professional.
Recommended: MTH 251

GEOG 530. RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT. (3 Credits)
Causes and consequences of conflict over natural resource management at local to global scales; principles for managing social-ecological systems for resilience. Field trip(s) may be required; transportation fee charged. Equivalent course is GEO 520.
Equivalent to: GEO 520

GEOG 554. GEOVISUALIZATION: GEOVISUAL ANALYTICS. (3 Credits)
Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages. Lec/lab. Equivalent course is GEO 445.
Prerequisites: GEOG 370 with C- or better or GEOG 371 with C- or better or GEO 360 with C- or better
Equivalent to: GEO 445

GEOG 567. GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS. (3 Credits)
Applications and implications of geospatial science (GIS, remote sensing, and spatial analysis) in intelligence, human, environmental, and ethical domains. Concepts and practices of ethics in geospatial science, including data access, management, visualization, and decision-making. Equivalent course is GEO 567.
Prerequisites: GEOG 360 with C- or better or GEOG 560 with C- or better or GEO 365 with C- or better or GEO 465 with C- or better
Equivalent to: GEO 567
Recommended: Senior standing

GEOG 580. REMOTE SENSING I: PRINCIPLES AND APPLICATIONS. (4 Credits)
Fundamentals of satellite remote sensing and image analysis. Topics include physical principles of remote sensing from the ultraviolet to the microwave, sensors and sensor technology, and environmental applications of remote sensing through image analysis. Lec/lab. Equivalent course is GEO 444.
Prerequisites: GEOG 201 with C- or better or GEO 301 with C- or better
Equivalent to: GEO 444

GEOG 581. REMOTE SENSING II: DIGITAL IMAGE PROCESSING. (4 Credits)
Digital analysis of remote sensor data. Image display enhancement, classification, and rectification principles. Practical experience with an image processing system. Equivalent course is GEO 466.
Prerequisites: GEOG 480 with C- or better or GEOG 580 with C- or better or GEO 444 with C- or better or GEO 544 with C- or better and (ST 202 [D-] or ST 352 [D-])
Equivalent to: GEO 466

GEOG 595. FIELD GEOGRAPHY SYNTHESIS. (3 Credits)
Explore how geographers use field work to investigate landscapes such as mountains, forests, coasts, tundra and desert to understand how they were formed and explain how they have changed over time. Learn techniques for finding out how landscape processes impact humans and, in turn, how humans impact the environment around them. Apply geographic theories and concepts to synthesize, analyze and interpret the relationship between human communities and the environment through the planning and execution of field work.
Prerequisites: GEOG 295 with C- or better or GEO 295 with C- or better
Equivalent to: GEO 435
Recommended: Junior or senior standing

GEOG 599. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 600. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee charged. Students may prepare guides for trips. Faculty sponsor must be prearranged.
This course is repeatable for 48 credits.
GEOG 531. GLOBAL RESOURCES AND DEVELOPMENT. (3 Credits)
Examines resource development issues and strategies in the Global South. Issues and strategies from agriculture, forestry, fisheries, energy, wildlife management, mineral development, land use, and health are examined. Equivalent course is GEO 526.
Equivalent to: GEO 526

GEOG 532. GEOGRAPHY OF FOOD AND AGRICULTURE. (3 Credits)
Overview of food and agriculture in relation to production and consumption regions as a basis for distinguishing different types of food and agricultural systems. Local and global examination of the geographic aspects of breeding, location in agricultural systems, and adaptation in agro-ecosystems using field study, explorations of literature, and lecture. Field trip required, transportation fee charged. Equivalent course is GEO 549.
Equivalent to: GEO 549

GEOG 533. CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY. (3 Credits)
Climate change poses challenges for human security and well-being, and for social and economic development. Evaluate how climate change impacts vary based on vulnerability, exposure, sensitivity, adaptive capacity, and risk.

GEOG 540. WATER RESOURCES MANAGEMENT IN THE UNITED STATES. (3 Credits)
An investigation of the various approaches to water resources geography within the U.S. Explores the disciplines that address water resources management, their tools, and their limitations. Topics include engineering, law, economics, risk assessment, game theory, conflict resolution, and the fine arts. Equivalent course is GEO 525.
Equivalent to: GEO 525
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 541. THE WORLD’S WATER. (3 Credits)
An investigation of the various approaches to water resources geography at the international level. Explores the interaction between water science and policy through issues of current ‘hydropolitics’ and water resources development. Topics include water quality, dams and development, conflict and cooperation, climate change, and water institutions. Equivalent course is GEO 524.
Equivalent to: GEO 524
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 546. ADVANCED LANDSCAPE AND SEASCAPE ECOLOGY. (4 Credits)
Pattern-process interactions in large scale ecological and physical systems, including terrestrial, aquatic, and marine/ocean ecosystems. Principles of pattern-process interactions from genetic to community levels of ecological organization applied to design of conservation reserves. Hypothesis testing, field techniques, spatial models/statistics, GIS/remote sensing. Lec/lab. Equivalent course is GEO 546.
Equivalent to: GEO 546

GEOG 550. LAND USE IN THE AMERICAN WEST. (3 Credits)
Development of a conceptual framework for land use study; analysis of land as a resource, land use trends, land use principles, and management issues as related to planning, focusing on the American West, the fastest growing region in the nation. Equivalent course is GEO 523.
Equivalent to: GEO 523

GEOG 551. PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES. (4 Credits)
Applies GIS skills and techniques to determine and analyze future land uses. Determine suitable land uses that incorporate community goals, site constraints and minimize use conflicts. Regulatory and market-based implementation strategies for land uses will also be discussed. Lec/lab. Equivalent course is GEO 552.
Prerequisites: GEOG 360 with C or better or GEOG 560 with C or better
Equivalent to: GEO 552

GEOG 552. SUSTAINABLE SITE PLANNING. (3 Credits)
Use of geographic concepts and techniques in site planning to create sustainable management reports for local sites. Inventory of environmental characteristics and human uses, conceptual design for future uses of the site, principles of green infrastructure and sustainable building practices. Local field trip required, transportation fee charged. Equivalent course is GEO 551.
Equivalent to: GEO 551
Recommended: GEOG 250

GEOG 556. GISCIENCE I: INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE. (4 Credits)
Introduction to modern spatial data processing, development, and functions of geographic information systems (GIS); theory, concepts and applications of geographic information science (GIScience). Equivalent course is GEO 565.
Equivalent to: GEO 565

GEOG 561. GISCIENCE II: ANALYSIS AND APPLICATIONS. (4 Credits)
Applications-based course. Development and conduct of geospatial analyses using various spatial data structures, techniques and models. Students acquire, clean, integrate, manipulate, visualize and analyze geospatial data through laboratory work. Lec/lab. Equivalent course is GEO 580.
Prerequisites: GEOG 560 with C or better
Equivalent to: GEO 580

GEOG 562. GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS. (4 Credits)
Introduction to the extension of geographic information systems (GIS) through programming. No prior programming experience is expected. Teaches a pragmatic approach to design and write programs for geospatial analysis. Equivalent course is GEO 578.
Prerequisites: GEOG 361 with C or better or GEOG 561 with C or better
Equivalent to: GEO 578

GEOG 563. GISCIENCE IV: SPATIAL MODELING. (4 Credits)
Introduction to spatial simulation models representing attraction, segregation, individual entities, and processes of spread, applied to contemporary problems in human and physical geography.
Prerequisites: GEOG 462 with C or better or GEOG 562 with C or better

GEOG 564. GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS. (3 Credits)
Applications and implications of geospatial science (GIS, remote sensing, and spatial analysis) in intelligence, human, environmental, and ethical domains. Concepts and practices of ethics in geospatial science, including data access, management, visualization, and decision-making. Equivalent course is GEO 567.
Prerequisites: GEOG 360 with C or better or GEOG 560 with C or better
Equivalent to: GEO 567
GEOG 565. SPATIO-TEMPORAL VARIATION IN ECOLOGY AND EARTH SCIENCE. (4 Credits)
Objectives and techniques of spatial and temporal analysis. Point patterns, geostatistics, spectral analysis, wavelet analysis, interpolation, and mapping. Equivalent course is GEO 541.
Equivalent to: GEO 541

GEOG 566. ADVANCED SPATIAL STATISTICS AND GISCIENCE. (4 Credits)
Provides advanced graduate students from a variety of disciplines in earth science and ecology the opportunity to structure and conduct spatio-temporal analyses using available software tools and their own datasets for their graduate research. Equivalent course is GEO 584.
Equivalent to: GEO 584

GEOG 571. GEOVISUALIZATION: WEB MAPPING. (4 Credits)
Overview of methods and applications in interactive, dynamic cartographic visualization. Design and construction of customized user interfaces to geographic information. Lec/lab. Equivalent course is GEO 568.
Equivalent to: GEO 568
Recommended: GEOG 370

GEOG 572. GEOVISUALIZATION: GEOVISUAL ANALYTICS. (3 Credits)
Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages. Lec/lab. Equivalent course is GEO 545.
Equivalent to: GEO 545
Recommended: GEOG 370 or GEO 371

GEOG 580. REMOTE SENSING I: PRINCIPLES AND APPLICATIONS. (4 Credits)
Fundamentals of satellite remote sensing and image analysis. Topics include physical principles of remote sensing from the ultraviolet to the microwave, sensors and sensor technology, and environmental applications of remote sensing through image analysis. Lec/lab. Equivalent course is GEO 544.
Equivalent to: GEO 544
Recommended: GEOG 201 or GEO 301

GEOG 581. REMOTE SENSING II: DIGITAL IMAGE PROCESSING. (4 Credits)
Digital analysis of remote sensor data. Image display enhancement, classification, and rectification principles. Practical experience with an image processing system. Equivalent course is GEO 566.
Prerequisites: GEOG 580 with C or better
Equivalent to: GEO 566
Recommended: ST 352 or ST 202

GEOG 595. FIELD GEOGRAPHY OF OREGON II. (3 Credits)
Designed to introduce students to the widest possible range of topics on all aspects of Oregon geography within a limited time, then turn that experience into a viable research proposal. While physical processes are the primary topic, resource and environmental effects are stressed. Field trip required, transportation fee charged. Equivalent course is GEO 534.
Equivalent to: GEO 534

GEOG 596. FIELD RESEARCH IN GEOMORPHOLOGY AND LANDSCAPE ECOLOGY. (3 Credits)
Natural history interpretation of disturbance and recovery processes and management implications in forest-stream landscapes of western Oregon. Course consists of field experience and several seminars. Transportation and lodging fee charged. Equivalent course is GEO 548.
Equivalent to: GEO 548
Recommended: 9 graduate credits in sciences or engineering.

GEOG 599. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 24 credits.

GEOG 600. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee charged. Students may prepare guides for trips. Faculty sponsor must be prearranged.
This course is repeatable for 48 credits.

GEOG 601. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.
This course is repeatable for 36 credits.

GEOG 603. THESIS. (1-16 Credits)
Independent, original study that culminates in a thesis Faculty sponsor must be prearranged.
This course is repeatable for 999 credits.

GEOG 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.

GEOG 607. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

GEOG 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 699. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 24 credits.

Geophysics

GPH 501. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N.
This course is repeatable for 24 credits.

GPH 503. THESIS. (1-16 Credits)
Thesis research and writing.
This course is repeatable for 999 credits.

GPH 505. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in geophysics, guided by discussions with supervising faculty. A written report may be required.
This course is repeatable for 16 credits.

GPH 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

GPH 601. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N.
This course is repeatable for 36 credits.

GPH 603. THESIS. (1-16 Credits)
Thesis research and writing.
This course is repeatable for 999 credits.

GPH 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in geophysics guided by discussions with supervising faculty. A written report may be required.
This course is repeatable for 16 credits.
GPH 607. SEMINAR. (1-16 Credits)
This course is repeatable for 48 credits.

GPH 630. ELEMENTS OF SEISMOLOGY. (4 Credits)
Survey of basic concepts in global seismology: world seismicity; elastic structure of the earth; seismic wave paths in the earth; locating earthquakes; earthquake focal mechanisms, magnitudes, stress drop, energy; stress and strain, elasticity, wave equation, plane waves in homogeneous and layered media, surface waves, free oscillations; ray theory; seismetry; earthquake prediction. Laboratory exercises include interpretation and analysis of seismograms from global seismographic networks.
Recommended: Differential equations.

GPH 632. CRUSTAL SEISMOLOGY. (3 Credits)
Structure of the earth's crust and upper mantle from seismic reflection and large offset (refraction, wide-angle reflection) data. Methods of data collection, data processing theory and practice, modeling and interpretation techniques, correlation of seismic results with laboratory measurements of rock properties, and regional case studies.
Prerequisites: GPH 630 with C or better

GPH 640. GEODESY. (4 Credits)
Physical and observational geodesy, including the Earth's gravity field and potential and determination of the Earth's geoid. Interpretation of geoid, geoid anomalies, and isostatic compensation. Gravity, point-position and remote sensing geodetic measurement techniques, including GPS, InSAR, VLBI, leveling, triangulation/trilateration, and low-Earth orbit gravity satellite missions are covered as are geodetic reference frames. Offered alternate years.

GPH 641. ELECTROMAGNETIC METHODS IN GEOPHYSICS. (3 Credits)
Survey of electromagnetic (EM) methods in geophysics. Review of electromagnetic theory, Maxwell's equations in the quasi-static limit, the diffusion of EM fields in a layered conductor, qualitative discussion of EM fields in 2- and 3-D conductors. EM techniques, including DC resistivity, magnetotellurics, controlled source EM, induced polarization, and long-period magnetometer array methods. Applications to exploration, to basic research on crustal structure and to studies of upper-maniet conductivity.
Recommended: Upper-division EM course.

GPH 642. EARTH MAGNETISM. (3 Credits)
Geomagnetism and magnetic potential: general morphology and secular change; internal and external sources; principles of paleomagnetism, including field and laboratory procedures; origin of remnant magnetism in rocks and the controlling physical and chemical processes; the origin of the Earth's magnetic field.

GPH 650. GEOPHYSICAL INVERSE THEORY. (4 Credits)
Survey of the theory and applications of inverse methods currently used in the geophysical sciences for the interpretation of inaccurate and inadequate data. Backus-Gilbert inverse theory, resolution, regularization methods (such as damped least squares) for linear and non-linear problems, stochastic inversion, and extremal models. Applications to seismic, gravity, magnetic and electromagnetic data.
Recommended: Linear algebra

GPH 651. GEODYNAMICS I. (3 Credits)
Application of the techniques of continuum mechanics to geological problems. Thermal and subsidence history of the lithosphere; stress and strain in the earth; elasticity and flexure of the lithosphere; gravitational compensation. Lec. Offered odd years on Corvallis campus in fall term (subject to change).

GPH 665. GEOPHYSICAL FIELD TECHNIQUES. (3 Credits)
Instrumentation, field methods and interpretation of gravimetric, magnetic, electrical and seismic prospecting techniques. Students will be required to collect, reduce, analyze, and interpret data.

GPH 689. SPECIAL TOPICS IN GEOPHYSICS. (1-4 Credits)
Special topics of current interest in geophysics, not covered in detail in other courses. May be repeated on different topics for credit.
This course is repeatable for 16 credits.

Marine Resource Management

MRM 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 24 credits.

MRM 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MRM 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MRM 506. PROJECTS. (1-16 Credits)
This course is repeatable for 72 credits.

MRM 507. SEMINAR. (1-16 Credits)
This course is repeatable for 48 credits.

MRM 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

MRM 510. INTERNSHIP. (1-9 Credits)
Planned and supervised resource management experience with selected cooperating governmental agencies, private organizations, or business firms. Supplementary conferences, reports and evaluations. Graded P/N.
This course is repeatable for 16 credits.

MRM 525. SPECIAL TOPICS IN MARINE RESOURCE MANAGEMENT. (1-4 Credits)
Subjects of current interest in marine resource management not covered in depth in other courses. May be repeated for credit when topic varies.
This course is repeatable for 24 credits.

MRM 530. PRINCIPLES AND PRACTICE OF MARINE RESOURCE MANAGEMENT. (3 Credits)
Introduces learners to the core concepts/skills required for guiding the management of the interactions between human and natural marine systems. Particular attention is given to the concept and framework of Ecosystem-Based Management, the goal of which is to conserve, maintain and restore ecosystem functions to promote the economic and ecological sustainability of marine ecosystems and human communities that depend on the services they provide. Tomorrow's marine resource managers must be capable of identifying, requesting, analyzing, synthesizing, and combining natural and social science with experiential knowledge and human/social capital to generate meaningful policy and management recommendations and strategies.

MRM 534. OCEANS IN CRISIS. (3 Credits)
Explores the state of the world's oceans and coasts, whether or not they are indeed in crisis, and what, if any management responses can be reasonably expected to halt and restore our oceans.

MRM 535. RIGHTS-BASED FISHERIES MANAGEMENT. (3 Credits)
Clear, appropriate and enforceable fishing entitlements and responsibilities are a cornerstone of sustainable fisheries management. Rights-based management tools such as dedicated access privileges, community quotas, co-management and cost recovery will be explored as ways of promoting individual and collective responsibility for sustainable fisheries management. High seas fisheries will also be addressed.
MRM 552. MARINE ECONOMICS. (3 Credits)
Economic aspects of marine resource utilization and management will be analyzed. Topics include open access aspect of marine resources; conflict and allocation of marine resources, marine resource markets, marine recreation, pollution, and aquaculture, with special emphasis on commercial fisheries. CROSSLISTED as AEC 552/MRM 552.
Equivalent to: AEC 552, AREC 552
Recommended: AEC 351 or AEC 352 or AREC 351 or AREC 352
MRM 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

Oceanography

OC 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.
OC 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

OC 103. *EXPLORING THE DEEP: GEOGRAPHY OF THE WORLD’S OCEANS. (4 Credits)
Introduces non-science students to the oceans, including marine geology and chemistry, ocean currents, coastal and biological processes. Field trip required, transportation fee charged. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: GEO 103H, OC 103H

OC 199. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
Introduction to topics of current interest in oceanography for lower-division undergraduates. May be repeated for credit when topic varies.
This course is repeatable for 16 credits.

OC 201. *OCEANOGRAPHY. (4 Credits)
Plate tectonics and the geological structure of ocean basins; physical and chemical properties of seawater; Earth’s energy budget; large-scale circulation of the atmosphere and ocean; marine sediment properties and transport; Earth history recorded in marine sediments; the carbon cycle in the atmosphere and sea; and the ecology of pelagic and benthic systems.
Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: OC 331H

OC 202X. INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY. (4 Credits)
Explore critical topics to biological oceanography, including; the interaction of ocean life, past and present, with its chemical, physical, and geological environment; how ocean life captures energy to produce food and affect climate; and how historical sea-faring observations shaped our understanding of ocean life relative to current technological advances. Field trips required.

OC 295. INTRODUCTION TO FIELD OCEANOGRAPHY - LAND. (1 Credit)
OC 295 is preparatory for the intensive OC 296 field portion at sea. Students will learn about the collection of samples and data using methods and instruments that are common in sea-going oceanography and help plan the cruise.
Prerequisites: OC 201 (may be taken concurrently) with D- or better

OC 296. INTRODUCTION TO FIELD OCEANOGRAPHY - SEA. (2 Credits)
The sea-going field portion of OC 295 onboard a large research vessel. During the multi-day cruise students will collect oceanographic data and samples from the coastal ocean. Students who complete OC 295 and OC 296 will learn how to collect data and samples on the high seas, conduct preliminary analyses of data, and contribute to the development of scientific knowledge. Serves as an introduction to upper-division course work in oceanography.
Prerequisites: OC 295 with P or better

OC 332. COASTAL OCEANOGRAPHY. (3 Credits)
Physics, geology, biology and hydrology of coastal oceans. How coastal waters respond to forcing by heating, cooling, winds, tides, waves, rain, evaporation, river runoff and freezing. Geography and geology of coastlines: erosion and deposition processes, beach dynamics. Coastal equilibrium cells as sources and sinks of sediment. Rocky shore, beach, mudflat, estuarine, and coastal biotic communities; animal migrations. Law of the Sea rights and responsibilities of coastal states. Fisheries and mariculture in coastal seas. Pollution and coastal ocean resources. Using a matrix to define environmental problems; pathways that pollutants take through the coastal ecosystem. Offered annually.
Equivalent to: OC 332H

OC 333. OCEANS, COASTS, AND PEOPLE. (3 Credits)
Contemporary issues related to human interactions with the oceans and coastal zones, including living and energy resources, geohazards and impacts of global change. Content presented in lectures, readings and group discussions, with project oral presentations.
Recommended: OC 201

OC 334. *POLAR OCEANOGRAPHY. (3 Credits)
Explores the physical, chemical and biological oceanography of the Arctic and Antarctic and examines the impacts of man’s activities both directly through resource utilization, and indirectly through climate change. Introduction to polar oceanography through a series of lectures, interactive classes, written assignments and a case study. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: OC 201 with D- or better

OC 399. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
This course is repeatable for 16 credits.
Equivalent to: OC 399H

OC 399H. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
Offered annually.

OC 401. RESEARCH PROJECTS. (1-16 Credits)
Field and laboratory research in oceanography for undergraduates, resulting in a written report.
This course is repeatable for 24 credits.

OC 403. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged. Graded P/N.
This course is repeatable for 24 credits.

OC 405. READING AND CONFERENCE. (1-4 Credits)
Independent library research and reading in specialized topics in oceanography for undergraduates, guided by discussions in conferences with faculty. A written report may be required.
This course is repeatable for 16 credits.
**OC 407. SEMINAR. (1-3 Credits)**
Undergraduate seminar on current developments in the oceanographic research literature, with student presentations and group discussions. A written report may be required.

*Equivalent to: OC 407H*

*This course is repeatable for 12 credits.*

**OC 407H. SEMINAR. (1-3 Credits)**
Undergraduate seminar on current developments in the oceanographic research literature, with student presentations and group discussions. A written report may be required.

*Attributes: HNRS – Honors Course Designator*

*Equivalent to: OC 407*

*This course is repeatable for 12 credits.*

**OC 410. INTERNSHIP. (1-16 Credits)**
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.

*This course is repeatable for 48 credits.*

*Recommended: 12 credits of upper-division college courses*

**OC 430. PRINCIPLES OF PHYSICAL OCEANOGRAPHY. (4 Credits)**
Fundamental principles of physical oceanography; conservation of mass, heat, momentum and vorticity; equations governing motion in the ocean; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation. Descriptive oceanography; application of the fundamental principles to the ocean; examination of the major current systems; water mass analysis. Offered annually.

*Recommended: One year each of college physics and college calculus*

**OC 433. COASTAL AND ESTUARINE OCEANOGRAPHY. (3 Credits)**
Circulation of the coastal ocean including continental shelf circulation, upwelling, coastal jets, undercurrents, coastal-trapped waves. Fundamentals of surface waves and tides; tsunamis, wind generation, breaking waves. Estuary classification and circulation patterns; shallow-water processes and beach morphology. Offered alternate years.

*Recommended: One year of college physics and one year of calculus*

**OC 434. ESTUARINE ECOLOGY. (4 Credits)**
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. CROSSLISTED as FW 434/OC 434 and FW 534/OC 534.

*Equivalent to: FW 434*

**OC 440. BIOLOGICAL OCEANOGRAPHY. (4 Credits)**
An advanced examination of the ocean as an ecosystem with emphasis on the processes affecting the production and structure of oceanic communities. Starting with the physical and chemical characteristics of the ocean environment, lectures and labs examine the flow of energy and matter from primary producers through primary consumers up to higher trophic levels. Microbial and benthic processes are examined. Current topics, such as hypoxia, ocean acidification and harmful algal blooms are discussed. Lec/lab.

*Prerequisites: OC 201 with C- or better*

*Recommended: Two terms of college-level biology*

**OC 449. ECOLOGICAL THEORIES IN BIOLOGICAL AND FISHERIES OCEANOGRAPHY DATA. (4 Credits)**
Students will learn the ecological theories applied in fisheries oceanography research and analytical techniques used to quantify fisheries oceanography processes. The lecture and lab sessions will be presented in the context of fundamental ecological research, including effects of environmental and climate variability on production and distribution of species and communities. A specific emphasis is toward analyses of large spatio-temporal data. Lec/Lab.

*Prerequisites: (MTH 252 with C or better or MTH 252H with C or better or MTH 228 with C or better) and (ST 351 [C] or ST 351H [C] and OC 440 (may be taken concurrently) [C] or BI 370 [C] or BI 370H [C])*

**OC 450. CHEMICAL OCEANOGRAPHY. (4 Credits)**
Chemical properties and processes in the oceans. Composition, origin and evolution of seawater; thermodynamic and kinetic predictions for reactions in seawater; major and minor element reservoirs and fluxes; vertical and horizontal transport of materials; isotopic clocks and tracers; nutrients; chemical processes and fluxes across major marine interfaces, including estuaries, atmosphere, sediments, suspended particles and hydrothermal systems. Lec/Lab.

*Prerequisites: CH 122 with D- or better or CH 232 with D- or better or CH 232H with D- or better*

*Recommended: one year of college-level general chemistry*

**OC 460. GEOLOGICAL OCEANOGRAPHY. (3 Credits)**
Structure of ocean basins, plate tectonics and sea floor spreading, marine sedimentation, history of ocean basins, and analysis of geological and geophysical data. Offered annually.

*Recommended: One year each of physics and chemistry or science background*

**OC 495X. ADVANCED FIELD OCEANOGRAPHY 1. (2 Credits)**
Design a ship-based research project and contribute to the preparation and planning for a related oceanographic cruise.

*Prerequisites: (OC 430 with C- or better or OC 440 with C- or better or OC 450 with C- or better or OC 460 with C- or better) and (OC 430 [C-] or OC 440 [C-] or OC 450 [C-] or OC 460 [C-])*

*Recommended: Senior standing*

**OC 496X. ADVANCED FIELD OCEANOGRAPHY 2. (4 Credits)**
Participate in an oceanographic cruise to collect data and samples. Analyze data and samples and prepare a written report of findings.

*Prerequisites: OC 495X with C- or better*

*Recommended: Senior standing*

**OC 499. SPECIAL TOPICS IN OCEANOGRAPHY. (0-4 Credits)**
Subjects of current interest in oceanography, not covered in depth in other courses. May be repeated for credit when topic varies.

*Equivalent to: OC 499H*

*This course is repeatable for 16 credits.*

**OC 501. RESEARCH. (1-16 Credits)**
Original research work that will not be part of the data used in a thesis. Graded P/N.

*This course is repeatable for 24 credits.*

**OC 503. THESIS. (1-16 Credits)**
Thesis research and writing.

*This course is repeatable for 999 credits.*

**OC 505. READING AND CONFERENCE. (1-16 Credits)**
Independent reading and library research on specialized topics in oceanography, guided by discussions with supervising faculty. A written report may be required.

*This course is repeatable for 16 credits.*
OC 506. PROJECTS. (1-16 Credits)
This course is repeatable for 72 credits.

OC 507. SEMINAR. (1-3 Credits)
Student presentations and discussions of current research literature or personal research results. Original research presentations by visiting scientists, OSU faculty and graduate students presenting final thesis results. Other sections and specific topics by arrangement. This course is repeatable for 48 credits.

OC 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

OC 512. BASIC MATLAB FOR ENVIRONMENTAL SCIENTISTS AND ENGINEERS. (2 Credits)
MATLAB desktop environment will be introduced and basic programming and data analysis skills will be developed, with an emphasis on writing optimized routines to analyze data sets utilizing matrix algebra and vectorization of functions. Basic graphics and visualization will be covered, including two-dimensional and three-dimensional graphing, contouring and movies.

OC 515. OREGON COAST MATH CAMP. (3 Credits)
Selected topics from differential calculus, integral calculus, ordinary and partial differential equations, statistics, linear algebra and vector calculus. Two-week course taught at Hatfield Marine Science Center in Newport, Oregon, before fall term begins. Graded P/N. Recommended: Differential and integral calculus and linear algebra.

OC 521. APPLICATIONS IN OCEAN ECOLOGY AND BIOGEOCHEMISTRY. (4 Credits)
Methodological underpinnings of marine ecology and biogeochemistry. Students will learn about both new and traditional methods of seawater analysis and biological rate determinations. They will evaluate methods by analyzing observations and samples, and assessing the interpretive effectiveness of approaches. Lec/lab.
Prerequisites: OEAS 540 with C or better
Corequisites: OC 522, OC 523
Equivalent to: G 521

OC 522. OCEAN BIOGEOCHEMICAL DYNAMICS. (4 Credits)
Examines what keeps ocean systems in balance, and determines their response to perturbation. The course relies on connections between physical transport and biogeochemical reaction rates and energetics, taught from the perspective of key ocean biogeochemical cycles.
Corequisites: OC 521, OC 523

OC 523. OCEAN ECOLOGICAL DYNAMICS. (4 Credits)
Major characteristics of ocean biota and ocean ecosystems. Main themes will be centered on the bioenergetics of marine systems at levels ranging from the individual to ocean biomes, and on how ocean biota facilitates diverse marine biogeochemical processes. Lec/rec.

OC 528. MICROPROBE ANALYSIS. (3 Credits)
Theory and application of electron microprobe analysis to problems in geology, engineering, chemistry, physics, and biology.
Equivalent to: GEO 528

OC 533. COASTAL AND ESTUARINE OCEANOGRAPHY. (3 Credits)
Circulation of the coastal ocean including continental shelf circulation, upwelling, coastal jets, undercurrents, coastal-trapped waves. Fundamentals of surface waves and tides; tsunamis, wind generation, breaking waves; shallow-water processes and beach morphology. Offered alternate years. Recommended: One year of college physics and one year of calculus.

OC 534. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. CROSSLISTED as FW 434/OC 434 and FW 534/OC 534.
Equivalent to: FW 434

OC 549. ECOLOGICAL THEORIES IN BIOLOGICAL AND FISHERIES OCEANOGRAPHY DATA. (4 Credits)
Students will learn the ecological theories applied in fisheries oceanography research and analytical techniques used to quantify fisheries oceanography processes. The lecture and lab sessions will be presented in the context of fundamental ecological research, including effects of environmental and climate variability on production and distribution of species and communities. A specific emphasis is toward analyses of large spatio-temporal data. Lec/Lab.
Recommended: (MTH 252 or MTH 252H or MTH 228) and (ST 351 or ST 351H) and (OC 440 or BI 370 or BI 370H)

OC 561. IGNEOUS AND TECTONIC PROCESSES IN THE OCEAN. (3 Credits)
An integrated view of the igneous and tectonic processes responsible for the formation and evolution of the ocean basins. The course is organized by tectonic environment including ridge crest, ridge flank, ocean basins, seamounts, and active and passive margins. Recommended: One year each physics, calculus and geology.

OC 562. SEDIMENTARY PROCESSES IN THE OCEAN BASINS. (3 Credits)
An integrated view of sediment processes in the ocean basins from a source to sink perspective, with a special emphasis on the interpretation of the historical record. Recommended: OC 550 and one year each physics and calculus and geology.

OC 574. EARLY LIFE HISTORY OF FISHES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years. CROSSLISTED as FW 574/OC 574.
Equivalent to: FW 574
Recommended: FW 315

OC 599. SPECIAL TOPICS IN OCEANOGRAPHY. (0-4 Credits)
Subjects of current interest in oceanography, not covered in depth in other courses. May be repeated for credit when topic varies. This course is repeatable for 12 credits.

OC 601. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N. This course is repeatable for 36 credits.

OC 603. THESIS. (1-16 Credits)
Thesis research and writing. This course is repeatable for 999 credits.

OC 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in oceanography, guided by discussions with supervising faculty. A written report may be required. This course is repeatable for 16 credits.

OC 606. PROJECTS. (1-16 Credits)
This course is repeatable for 84 credits.
OC 607. SEMINAR. (1-3 Credits)
Student presentations and discussion of current research literature or personal research results. Original research presentations by visiting scientists, OSU faculty and graduate students presenting final thesis results. Other sections and specific topics by arrangement. This course is repeatable for 48 credits.

OC 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

OC 630. OCEAN WAVE MECHANICS I. (3 Credits)
Linear wave boundary value problem formulation and solution, water particle kinematics, shoaling, refraction, diffraction, and reflection. Linear long wave theory with applications to tides, seiching, and storm surge. CROSSLISTED as CE 630/OC 630.
Equivalent to: CE 630

OC 631. OCEAN WAVE MECHANICS II. (3 Credits)
Second in the sequence of ocean wave engineering mechanics, covers the following topics: introduction to long wave theory, wave superposition, wave height distribution, and the wind-wave spectrum, introduction to wave forces, and basic nonlinear properties of water waves. May include additional selected topic in wave mechanics. CROSSLISTED as CE 631/OC 631.
Prerequisites: CE 630 with C or better or OC 630 with C or better
Equivalent to: CE 631

OC 634. LONG WAVE MECHANICS. (3 Credits)
Theory of long waves. Depth-integrated Euler’s equation and its jump conditions. Evolution equations and their solutions. Nonlinear shallow-water waves, the Korteweg-deVries equation and Boussinesq equation. Boundary-layer effects. Shallow-water waves on beaches. Applications of the fundamentals to problems of tsunamis. CROSSLISTED as CE 634/OC 634.
Prerequisites: OC 630 with C or better and CE 631 [C]
Equivalent to: CE 634
Recommended: OC 670

OC 635. APPLIED MODELING OF NEARSHORE PROCESSES. (4 Credits)
An introduction to numerical modeling of the nearshore ocean, providing hands-on experience with state-of-the-art numerical models for wave propagation, nearshore circulation, planform shoreline evolution and bathymetric profile evolution. The focus is on review of model requirements, detailed study of several specific models for several domains of interest, application to coastal phenomena, and the interpretation of model results. Offered alternate years. CROSSLISTED as CE 635/OC 635.
Equivalent to: CE 635

OC 646. PHYSICAL/BIOLOGICAL INTERACTIONS IN THE UPPER OCEAN. (4 Credits)
Variability in physical oceanic processes in the upper ocean and relationship to spatial and temporal variations in biomass, growth rates, and other biological patterns in the organisms of ocean surface waters. The relationship between variability in ocean physical phenomena and ecosystem dynamics, including the requirements of sampling design for upper ocean ecological studies. Time and space scales of physical and biological phenomena in the upper ocean. Offered alternate years.
Offered alternate years, typically fall term.
Prerequisites: OEAS 530 with C or better and OEAS 540 [C]

OC 649. SPECIAL TOPICS IN BIOLOGICAL OCEANOGRAPHY. (1-4 Credits)
Special topics of current interest in biological oceanography not covered in detail in other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 654. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
Special topics of current interest in oceanography not covered in detail in other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 657. SEDIMENT BIOGEOCHEMISTRY. (3 Credits)
An overview of early diagenetic processes in marine sediments and the interdisciplinary approaches used to quantify material transformations at the seafloor. Recommended: OC 550

OC 659. SPECIAL TOPICS IN CHEMICAL OCEANOGRAPHY. (1-4 Credits)
Special topics of current interest in chemical oceanography not covered in detail by other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 660. PALEOCEANOGRAPHY. (3 Credits)
Large-scale changes in the oceanic and atmospheric system, as recorded in marine sediments, and their implications for understanding global environment changes. Chemical, physical, and biological proxies for oceanic and atmospheric processes in the geologic record period. Evidence for changing global climate at time scales longer than the historical record; the oceanic history of the Late-Cenozoic ice ages, long term evolution of climate change patterns, catastrophic global environmental events, and application of quantitative models to the past. Current research topics in paleoceanography. Offered alternate years. Recommended: OC 560

OC 662. NEARSHORE HYDRODYNAMICS. (3 Credits)
Briefly reviews wave processes in the nearshore, and concentrates on the wave-averaged circulation with an eye towards it potential effects on bathymetric change. Recommended: Previous courses related to water wave mechanics and differential equations

OC 664. NEARSHORE SEDIMENT TRANSPORT. (3 Credits)
To study the dynamics of a nearshore wave field propagating over a shoaling bathymetry, the response of sediments and morphology to those motions, emergent morphology due to the coupled system, anthropogenic influences and mitigation. Recommended: General physics, integral and differential calculus; nearshore hydrodynamics.

OC 668. THEORETICAL PETROLOGY. (3 Credits)

OC 669. SPECIAL TOPICS IN GEOLOGICAL OCEANOGRAPHY. (1-4 Credits)
Subjects of current interest in geological oceanography not covered in depth in other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 670. FLUID DYNAMICS. (4 Credits)
Fundamentals of fluid dynamics: conservation laws of mass, momentum, and energy; inviscid and viscous flows; boundary layers; vorticity dynamics; irrotational and potential flow. Offered annually. Recommended: One year of college physics; mathematics through differential equations and vector calculus.

OC 671. GEOPHYSICAL FLUID DYNAMICS. (4 Credits)
Dynamics of rotating and stratified fluids, potential vorticity, geostrophic motion; inviscid shallow-water theory, Poincare, Kelvin, and Rossby waves; geostrophic adjustment, quasigeostrophic approximation, Ekman layers, two-layer and continuously stratified models. Offered annually. Recommended: OC 670 with C or better
OC 672. THEORY OF OCEAN CIRCULATION. (4 Credits)  
Theory of steady and time-dependent large-scale circulation in ocean basins. Effects of earth's curvature: the beta-plane approximation. The wind-driven Sverdrup circulation, western boundary currents, eastern boundary upwelling; the effects of friction. Linear theory and nonlinear theory; inertial gyres. Effects of buoyancy forcing; heating, cooling, evaporation, precipitation; density stratification. Wind- and buoyancy-forced circulation in the thermocline; ventilation. Potential vorticity conservation and homogenization. Offered annually.  
Prerequisites: OC 670 with C or better and OC 671 [C]  

OC 673. DESCRIPTIVE PHYSICAL OCEANOGRAPHY. (4 Credits)  
Fundamental mass, force, and energy balances of the ocean; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation; vorticity; air-sea fluxes of heat, salt, moisture and momentum. Application of these balances through descriptive examination of the ocean-global heat budget; surface current systems; abyssal circulation. Study of variability on a variety of time and space scales. Instrumentation and platforms used for observing the ocean. Offered annually.  
Prerequisites: OC 670 with C or better or OC 670 with C or better or ATS 515 with C or better  

OC 674. TURBULENCE. (4 Credits)  
Governing equations, turbulent kinetic energy, vorticity dynamics; turbulent transports of mass and momentum; statistical description of turbulent flows, spectral dynamics; turbulent boundary layers, planetary boundary layers in the atmosphere and ocean, convective mixed layers, stable boundary layers; deep ocean turbulence. Offered alternate years.  
Prerequisites: OC 670 with C or better  

OC 675. NUMERICAL MODELING IN OCEAN CIRCULATION. (4 Credits)  
Review of theoretical models of ocean circulation, including shallow water, barotropic, quasigeostrophic, and primitive equation models; adjustment times, internal length and time scales; the role of advection, bathymetry, and coastlines; global models, basin models, regional models and models of jets, eddies and boundary currents. Review of numerical techniques and problems specific to ocean modeling. Local facilities are used to develop models on remote supercomputers.  
Prerequisites: OC 670 with C or better  
Recommended: Working knowledge of FORTRAN  

OC 676. INVERSE MODELING AND DATA ASSIMILATION. (4 Credits)  
Survey of methods for combining oceanographic observations and observing systems with numerical models of ocean circulation. Topics include: finite-dimensional least squares theory with inequality constraints; optimal interpolation; the representation theory of smoothing; the Kalman smoother and filter; gradient descent methods for minimization; spatial and temporal regularity of filters and smoothers; linear theory of array design; nonlinear optimization, practical assimilation methods.  
Recommended: Strong background in linear algebra and advanced calculus, geophysical fluid dynamics, numerical modeling of ocean circulation.  

OC 678. OCEAN REMOTE SENSING. (4 Credits)  
Theory and applications of satellite remote sensing observations of the ocean with emphasis on strengths and limitations in the measurements. Topics include review of electricity and magnetism, absorption and scattering in the atmosphere (radiative transfer), satellite orbital mechanics, measurements of ocean color, infrared remote sensing, microwave radiometry, scatterometry, and satellite altimetry. Offered alternate years.  
Recommended: MTH 252 and PH 212  

OC 679. SPECIAL TOPICS IN PHYSICAL OCEANOGRAPHY. (1-4 Credits)  
Subjects of current interest in physical oceanography, not covered in depth in other courses. May be repeated for credit when topic varies.  
This course is repeatable for 16 credits.  

OC 680. STABILITY OF GEOPHYSICAL FLUID FLOWS. (4 Credits)  
Linear perturbation analysis applied to geophysical flows. These methods provide both quantitative and conceptual insight into the formative stages of turbulent flow. Emphasis is on practical numerical methods for the solution of differential eigenvalue problems. Examples are drawn from a wide range of geophysical flow instabilities, based in part upon student interests.  
Prerequisites: OC 670 with C or better  
Recommended: Multivariate calculus, matrix calculus, Matlab and concurrent enrollment in OC 670  

OC 681. GEOPHYSICAL WAVES. (4 Credits)  
Fundamentals of wave dynamics applied to geophysical fluids. Hyperbolic waves--linear and nonlinear; characteristics; shock waves. Dispersive waves--linear waves, dispersion relations, group velocity; isotropic and anisotropic dispersion; nonlinear solitary waves. Application to geophysical waves--surface gravity, capillary, internal gravity, Kelvin, planetary, coastal. Offered alternate years.  
Prerequisites: OC 670 with C or better  

OC 682. DATA ANALYSIS IN THE TIME AND SPACE DOMAINS. (4 Credits)  
Theory of classical and modern techniques for analysis of data in the time and space domains with applications to real oceanographic and atmospheric data. Topics include correlation analysis, regression analysis, EOF analysis, objective mapping, interpolation, filtering, sampling errors, and confidence tests. Offered alternate years.  
Recommended: MTH 341 and MTH 342 and MTH 418 and OC 608 and ST 314 and a working knowledge of Matlab, IDL, or FORTRAN  

OC 683. DATA ANALYSIS IN THE FREQUENCY AND WAVE NUMBER DOMAINS. (4 Credits)  
Theory of classical and modern techniques for analysis of data in the frequency and wavenumber domains with applications to real oceanographic and atmospheric data. Topics include sampling theory, one-dimensional autospectral analysis, multidimensional autospectral analysis, coherence and phase analysis, bi-spectral analysis, wavelet analysis, and confidence tests. Offered alternate years.  
Equivalent to: ATS 683  
Recommended: MTH 341 and MTH 342 and MTH 418 and OC 608 and ST 314 and a working knowledge of Matlab, IDL, or FORTRAN  

OC 691. PROPOSAL WRITING. (3 Credits)  
Teaches the use of NSF Fastlane. Includes a discussion of ethics and fairness in reviewing, a review of real proposals by faculty, a simulated NSF funding panel, and then development of a real proposal, for review purposes. This will relate directly to the student's current thesis or project. The course enables graduate students from all disciplines to develop rigorous, well thought-out proposals. It should be taken early enough in the program so that the proposal process contributes to their research progress.  

OC 808. WORKSHOP. (1-16 Credits)  
This course is repeatable for 16 credits.
Ocean, Earth, and Atmospheric Sciences

OEAS 500. CASCADIA FIELD TRIP. (2-4 Credits)
A field course to various locations within the Cascade volcanic arc, Coast Range and Oregon Coast. Introduction to the range of physical and biological science topics to be covered in OEAS 520, OEAS 530 and OEAS 540 in field settings; the linkages between these topics, and their impact on humans, with case examples. Students will practice math skills, and collect samples and data to be used in laboratory sessions in the later courses. Offered annually. Transportation fee charged. Graded P/N.

This course is repeatable for 4 credits.

OEAS 511X. PROFESSIONAL INSTRUCTION IN CEOAS. (1 Credit)
Provides graduate teaching assistants and potential teaching assistants in the College of Earth, Ocean, and Atmospheric Sciences with an introduction to effective instruction techniques, including the expectations of instructors, teaching pedagogy, use of technology, ethical instruction, inclusivity in the classroom and other topics.

OEAS 520. THE SOLID EARTH. (4 Credits)
Movement of mass and energy within the Earth and into/out of its outer surface, expressed as plate tectonics, earthquakes, heat flow, volcanoes, geomagnetic field; composition, structure, hydrology and aging of ocean crust; lithosphere creation, recycling and mantle overturn. Marine sedimentation, sources and transport, continental weathering, tectonics-climate interactions, glacial history and sea level response. Geohazards, storm events, beach and estuary processes. Offered annually. Lec/lab.

Recommended: One year each of physics, chemistry and calculus

OEAS 530. THE FLUID EARTH. (4 Credits)
Fundamental principles of fluid circulation in the atmosphere and ocean. Atmospheric chemistry, radiation, thermodynamics, and dynamics. Conservation of mass, heat, momentum and vorticity in the ocean; equations governing motion; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation. Air-sea fluxes and global circulation models; climate change. Offered annually. Lec/lab.

Recommended: One year each of physics, chemistry, calculus, or science and a field course

OEAS 540. THE BIOGEOCHEMICAL EARTH. (4 Credits)
Integrating fundamental concepts in biological and chemical oceanography to understand energy and material transformations in estuarine, coastal and open ocean habitats. Topics include structure and function of marine ecosystems, biogeochemical cycles, and human impacts. Offered annually. Lec/lab.

Recommended: One year of physics, chemistry, and calculus

Also offered via Ecampus.

Earth Sciences Minor

The Earth Sciences minor is designed for students who have a broad interest in Earth Sciences. Earth Science majors and Environmental Sciences majors are restricted from taking this minor.

Minor Code: 835

Students must complete a minimum of 14 unique credits in the minor that do not fulfill requirements of other majors, minors, options or certificates. Students cannot S/U minor requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS 201</td>
<td>*CLIMATE SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>GEO 201</td>
<td>*PHYSICAL GEOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

Earth Sciences Undergraduate Major (BS, HBS)

The Earth Sciences major program is among the nation’s premier undergraduate programs, serving students with a broad range of interests and career aspirations. The program engages in science and in critical societal issues facing the region, the nation, and the international community.

The Earth Sciences major offers three options: Climate Science, Geology, and Ocean Science. The degree emphasizes hands-on learning through laboratory and field, or shipboard, experiences and undergraduate research and internships. The separate options provide preparation for careers with climate, geological or marine science emphasis and are also suited for students interested in careers in environmental science, science education, and in graduate studies.

The Geology option includes the topics covered by the test for the state Geologist Practice Examination (http://www.oregon.gov/osbge/Pages/) conducted by the Board of Geologist Examiners.

Major Code: 834

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Select 36-38 credits</td>
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</table>

Earth Sciences Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS 201</td>
<td>*CLIMATE SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
<td></td>
</tr>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
</tbody>
</table>

Select 4 courses from the following list (total upper-division elective credits must be 11):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS 310</td>
<td>METEOROLOGY</td>
<td></td>
</tr>
<tr>
<td>GED 305</td>
<td>LIVING WITH ACTIVE CASCADE VOLCANOES</td>
<td></td>
</tr>
<tr>
<td>GED 306</td>
<td>MINERALS, ENERGY, WATER, AND THE ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>GED 307</td>
<td>NATIONAL PARK GEOLOGY AND PRESERVATION</td>
<td></td>
</tr>
<tr>
<td>GED 308</td>
<td>GLOBAL CHANGE AND EARTH SCIENCES</td>
<td></td>
</tr>
<tr>
<td>GED 352</td>
<td>OREGON: GEOLOGY, PLACE, AND LIFE ON THE RING OF FIRE</td>
<td></td>
</tr>
<tr>
<td>GED 380</td>
<td>EARTHQUAKES IN THE PACIFIC NORTHWEST</td>
<td></td>
</tr>
<tr>
<td>GEDG 323</td>
<td>CLIMATOLOGY</td>
<td></td>
</tr>
<tr>
<td>GEDG 324</td>
<td>ECOLOGICAL BIOGEOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>GEDG 340</td>
<td>INTRODUCTION TO WATER SCIENCE AND POLICY</td>
<td></td>
</tr>
<tr>
<td>GEDG 350</td>
<td>GEOGRAPHY OF NATURAL HAZARDS</td>
<td></td>
</tr>
<tr>
<td>OC 332</td>
<td>COASTAL OCEANOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>OC 333</td>
<td>OCEANS, COASTS, AND PEOPLE</td>
<td></td>
</tr>
<tr>
<td>OC 334</td>
<td>POLAR OCEANOGRAPHY</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Ecampus students should check the Schedule of Classes (https://classes.oregonstate.edu/) to identify online courses
Climate Science Option

This option is offered within the following major(s):

- Earth Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 317)

Students completing the Climate Science option will be prepared for a variety of careers in different areas related to climate, including

1. research and technical fields,
2. outreach, education, and communication, and
3. policy and economics.

All students will gain skills in the areas of basic science, data collection and analysis, in addition to a rigorous curriculum in climate science. A broad set of electives will allow students to pursue additional course work to prepare them in their specific areas of interest. Some students may choose to pursue advanced degrees in related disciplines, whereas others will enter the job market directly.

Option Code: 836

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 221</td>
<td>RECITATION FOR PHYSICS 211 1</td>
<td>1</td>
</tr>
<tr>
<td>CH 122</td>
<td>*GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
<td>10</td>
</tr>
</tbody>
</table>

Option A

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 202</td>
<td>*GENERAL PHYSICS</td>
<td>4</td>
</tr>
<tr>
<td>PH 203</td>
<td>*GENERAL PHYSICS</td>
<td>4</td>
</tr>
</tbody>
</table>

Option B

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 212</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 212</td>
<td>4-5</td>
</tr>
</tbody>
</table>

Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS 295</td>
<td>OBSERVING CLIMATE</td>
<td>3</td>
</tr>
<tr>
<td>ATS 301</td>
<td>CLIMATE DATA ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>ATS 310</td>
<td>METEOROLOGY</td>
<td>4</td>
</tr>
<tr>
<td>ATS 420</td>
<td>PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE</td>
<td>4</td>
</tr>
<tr>
<td>ATS 421</td>
<td>CLIMATE MODELING</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 484</td>
<td>INTRODUCTION TO BIOGEOCHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 486</td>
<td>QUATERNARY PALEOCLIMATOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>

Select an additional 15 credits of electives listed above or below:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 423</td>
<td>SNOW HYDROLOGY</td>
<td>4</td>
</tr>
<tr>
<td>OC 334</td>
<td>*POLAR OCEANOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>OC 430</td>
<td>PRINCIPLES OF PHYSICAL OCEANOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>OC 440</td>
<td>BIOLOGICAL OCEANOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>OC 450</td>
<td>CHEMICAL OCEANOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>OC 460</td>
<td>GEOLOGICAL OCEANOGRAPHY</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours: 80-81
Students taking PH 211 in this option are required to take PH 221 concurrently

^ Baccalaureate Core Course

\section*{Option Code: 836}

\section*{Geology Option}

This option is offered within the following major(s):

\begin{itemize}
  \item Earth Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 317)
\end{itemize}

The Geology option is suitable for students interested in careers in applied geology, environmental sciences, science education, and in research. The Geology option includes the topics covered by the test for the state Geologist Practice Examination (http://www.oregon.gov/osbge/Pages/) conducted by the Board of Geologist Examiners.

\section*{Option Code: 262}

\section*{Ocean Science Option}

This option is offered within the following major(s):

\begin{itemize}
  \item Earth Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 317)
\end{itemize}

Because of its interdisciplinary scope and quantitative rigor, the Ocean Science option is suitable for students interested in careers in all aspects of marine science, environmental sciences, science education, and in advanced graduate studies in a range of subjects.

\section*{Option Code: 659}
Experiential Learning
Select 6 credits of the following (combinations of these are allowed): 1
- OC 401 RESEARCH PROJECTS
- OC 403 THESIS
- OC 410 INTERNSHIP
Select 2 credits of the following for two terms of enrollment in a marine-oriented seminar series:
- OC 407 SEMINAR

Electives
Select at least 18 credits of the following: 2

Biological
- BI 211 *PRINCIPLES OF BIOLOGY
- BI 212 *PRINCIPLES OF BIOLOGY
- BI 351 MARINE BIOLOGY
- BI 370 ECOLOGY
- FW 464 MARINE CONSERVATION BIOLOGY
- GEO 484 INTRODUCTION TO BIOGEOCHEMISTRY
- OC 434/FW 434 ESTUARINE ECOLOGY

Climate
- ATS 301 CLIMATE DATA ANALYSIS
- ATS 310 METEOROLOGY
- ATS 420 PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE
- ATS 421 CLIMATE MODELING
- GEO 481 GLACIAL GEOLOGY
- GEO 486 QUATERNARY PALEOClimatology
- GEOG 323 *CLIMATOLOGY

Fluids
- CE 311 FLUID MECHANICS
- CE 412 HYDROLOGY
- OC 433 COASTAL AND ESTUARINE OCEANOGRAPHY

Geological
- GEO 370 STRATIGRAPHY AND SEDIMENTOLOGY
- GEO 433 COASTAL GEOMORPHOLOGY
- GEO 463 *GEOPHYSICS AND TECTONICS

Remote Sensing
- GEOG 370 GEOVISUALIZATION: CARTOGRAPHY
- GEOG 480 REMOTE SENSING I: PRINCIPLES AND APPLICATIONS

Total Hours 78

1 The program must contain at least 6 credits of experiential learning that may include an internship, research or senior thesis. Combinations of these are allowed (e.g., 3 credits of internship or 3 credits of research). Students are urged to work with advisors and the program head at an early stage of their study to plan their experiential learning.

2 Students could choose to focus on a specific area or sample from a wide range. Additional MTH courses would be appropriate for some students planning on graduate studies in ocean science.)

* Baccalaureate Core Course
^ Writing Intensive Course (WIC)

Courses taken in the ‘Humans and the Environment’ section of the Environmental Sciences minor must be unique to the minor and cannot be used to satisfy major or other minor requirements. Course substitutions must be selected in consultation with an environmental sciences advisor. Substitutions must cover material in the same course category (natural environmental systems or humans and the environment) at a similar or higher level. Credits must sum to a minimum of 27.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS 420</td>
<td>PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE</td>
<td>4</td>
</tr>
<tr>
<td>or GEOG 323</td>
<td>*CLIMATOLOGY</td>
<td></td>
</tr>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>or FES 341</td>
<td>FOREST ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>GED 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
<td></td>
</tr>
<tr>
<td>GED 221</td>
<td>*ENVIRONMENTAL GEOLGY</td>
<td></td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>SOIL 395</td>
<td>**WORLD SOIL RESOURCES</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>OC 201</td>
<td>*OCEANOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
<td></td>
</tr>
<tr>
<td>GEO 487</td>
<td>HYDROGEOLOGY</td>
<td></td>
</tr>
<tr>
<td>GEOG 340</td>
<td>*INTRODUCTION TO WATER SCIENCE AND POLICY</td>
<td></td>
</tr>
</tbody>
</table>

Humans and the Environment
Select at least one course in each of the following five categories:

Economics
Select at least one course from the following: 3-4
- AEC 250 *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY
- ECON 201 *INTRODUCTION TO MICROECONOMICS
- ECON 202 *INTRODUCTION TO MACROECONOMICS
- FW 462 ECOSYSTEM SERVICES

Environmental Law and Policy
Select at least one course from the following: 3-4
- AEC 253 *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS
- AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
- AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY
- AEC 432 ENVIRONMENTAL LAW
- FOR 462 NATURAL RESOURCE POLICY AND LAW
- FW 415 FISHERIES AND WILDLIFE LAW AND POLICY
- PS 475 ENVIRONMENTAL POLITICS AND POLICY
- PS 476 *SCIENCE AND POLITICS
- PS 477 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
- SOC 360 *POPULATION TRENDS AND POLICY

Ethics and Environmental Ethics
Select at least one course from the following: 3-4
- ANTH 481 *NATURAL RESOURCES AND COMMUNITY VALUES
- CH 374 *TECHNOLOGY, ENERGY, AND RISK
- FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
- FES 485 *CONSENSUS AND NATURAL RESOURCES
- FW 340 *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES
- GEO 309 *ENVIRONMENTAL JUSTICE
- PHL 325 *SCIENTIFIC REASONING
- PHL 439 PHILOSOPHY OF NATURE
- PHL 443 *WORLD VIEWS AND ENVIRONMENTAL VALUES
- PHL 448/ES 448 NATIVE AMERICAN PHILOSOPHIES
- PS 461 ENVIRONMENTAL POLITICAL THEORY

Option Code: 659

Environmental Sciences Minor
Also available via Ecampus.

Minor Code: 758
Environmental Sciences Undergraduate Major (BS, HBS)

Also available at OSU-Cascades and via Ecampus.

Larry C. Becker, Director
Environmental Sciences Undergraduate Program
104 CEOAS Administration Building
Oregon State University

Minor Code: 758

Environmental Sciences Undergraduate Major (BS, HBS)

Also available at OSU-Cascades and via Ecampus.

Larry C. Becker, Director
Environmental Sciences Undergraduate Program
104 CEOAS Administration Building
Oregon State University

Baccalaureate Core Course (BCC)

Writing Intensive Course (WIC)

Major Code: 657

Major Curriculum

The Environmental Sciences major requires credits in seven categories: 48 credits of baccalaureate core; 51–53 credits of basic science and math; 27–36 credits of environmental sciences and humanities; 27–31 credits of specialization; 3 credits writing intensive course; 3 credits minimum of experiential learning; and 4–53 credits of elective courses (depends on the number of baccalaureate core electives that will also meet requirements of the major).

Baccalaureate Core

The university baccalaureate core course (BCC) requirement is met with 48 credits and a writing intensive course (WIC). The environmental sciences student satisfies the general education requirement by selecting 27 unrestricted credits from the general list of approved courses and 21 credits from a restrictive list of BCC courses, which simultaneously satisfy requirements for the Environmental Sciences major. The WIC and Synthesis requirements are satisfied by courses taken as part of the environmental sciences core curriculum.

Code Title Hours

Baccalaureate Core

Select 48 credits

Basic Science and Math Courses

Select one of the following options: 12

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>&amp; BI 212</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>&amp; BI 213</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
</tr>
</tbody>
</table>

Select one of the following options: 15

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>BI 204</td>
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<tr>
<td>&amp; BI 205</td>
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Select one of the following options:

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Environmental Sciences and Humanities Core

**Orientation**

ENSC 101 | ENVIRONMENTAL SCIENCES ORIENTATION | 1 1 |

Natural Environmental Systems

**Select one Atmosphere course:**

ATS 201 | *CLIMATE SCIENCE | 1 |
ATS 310 | METEOROLOGY      |     |
ATS 420 | PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE | |
GEOG 323 | *CLIMATOLOGY |     |

**Select one Biosphere course:**

BI 370 | ECOLOGY | 3 |
GEOG 324 | *ECOLOGICAL BIOGEOGRAPHY |     |

**Select one Geosphere course:**

CSS 205 | *SOIL SCIENCE | 3-4 |
GEO 201 | *PHYSICAL GEOLOGY |     |
GEO 202 | *EARTH SYSTEMS SCIENCE |     |
GEO 221 | *ENVIRONMENTAL GEOLOGY |     |
GEO 322 | SURFACE PROCESSES |     |
GEOG 102 | *PHYSICAL GEOGRAPHY |     |
SOIL 205 | SOIL SCIENCE |     |
& SOIL 206 | and *SOIL SCIENCE LABORATORY FOR SOIL 205 |     |
SOIL 395 | **WORLD SOIL RESOURCES |     |

**Select one Hydrosphere course:**

FW 456 | FRESHWATER ECOLOGY AND CONSERVATION | 3-5 |
GEOG 487 | HYDROLOGY |     |
GEOG 340 | *INTRODUCTION TO WATER SCIENCE AND POLICY |     |
GEOG 424 | HYDROLOGY FOR WATER RESOURCES MANAGEMENT |     |
OC 201 | *OCEANOGRAPHY |     |

Humans and the Environment

**Select one Environmental Economics and Policy course:**

AEC 250 | *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY |     |
AEC 253 | *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS |     |
AEC 351 | *NATURAL RESOURCE ECONOMICS AND POLICY |     |
AEC 352/ECON 352 | *ENVIRONMENTAL ECONOMICS AND POLICY |     |
AEC 432 | ENVIRONMENTAL LAW |     |
ECON 201 | *INTRODUCTION TO MICROECONOMICS |     |
FOR 462 | NATURAL RESOURCE POLICY AND LAW |     |
FW 324 | *FOOD FROM THE SEA |     |
FW 415 | FISHERIES AND WILDLIFE LAW AND POLICY |     |
FW 422 | INTRODUCTION TO OCEAN LAW |     |
GEOG 462 | Ecosystem Services |     |
GEOG 340 | *INTRODUCTION TO WATER SCIENCE AND POLICY |     |
GEOG 450 | LAND USE IN THE AMERICAN WEST |     |
GEOG 451 | PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES |     |
PPOL 446 | THE POLICY AND LAW OF U.S. COASTAL GOVERNANCE |     |
PPOL 447 | INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE |     |
PS 473 | US ENERGY POLICY |     |
PS 475 | ENVIRONMENTAL POLITICS AND POLICY |     |
PS 476 | *SCIENCE AND POLITICS |     |
PS 477 | INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY |     |
SOC 350 | *POPULATION TRENDS AND POLICY |     |
WGSS 440 | *WOMEN AND NATURAL RESOURCES |     |

**Select one Environmental Ethics course:**

ANTH 481 | *NATURAL RESOURCES AND COMMUNITY VALUES | 3-4 |
CH 374 | *TECHNOLOGY, ENERGY, AND RISK |     |
ES 435 | *ENVIRONMENTAL RACISM |     |
ES 448/PHL 448/REL 448 | NATIVE AMERICAN PHILOSOPHIES |     |
FES 435/TOX 435 | *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK |     |
FES 485 | *CONSENSUS AND NATURAL RESOURCES |     |
FW 340 | *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES |     |
GEO 309 | *ENVIRONMENTAL JUSTICE |     |
PHL 325 | *SCIENTIFIC REASONING |     |
PHL 439 | PHILOSOPHY OF NATURE |     |
PHL 440 | *ENVIRONMENTAL ETHICS |     |
PHL 445/REL 443 | *WORLD VIEW AND ENVIRONMENTAL VALUES |     |
PS 461 | ENVIRONMENTAL POLITICAL THEORY |     |
SOC 456 | *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT |     |
SOC 480 | *ENVIRONMENTAL SOCIOLOGY |     |
SOC 481 | *SOCIETY AND NATURAL RESOURCES |     |
WGSS 440 | *WOMEN AND NATURAL RESOURCES |     |

**Select one Human Environment course:**

AG 301 | *ECOSYSTEM SCIENCE OF PACIFIC NW indians | 3-4 |
BI 301 | *HUMAN IMPACTS ON ECOSYSTEMS |     |
BI 347 | *OCEANS IN PERIL |     |
BI 348 | *HUMAN ECOLOGY |     |
EAI 411 | **PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES |     |
ENSC 479 | **ENVIRONMENTAL CASE STUDIES |     |
FW 324 | *FOOD FROM THE SEA |     |
FW 325 | *GLOBAL CRISIS IN RESOURCE ECOLOGY |     |
FW 470 | *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN |     |
GEOG 420 | *GEOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN |     |
GEOG 431 | *GLOBAL CHANGE AND EARTH SCIENCES |     |
GEOG 203 | *HUMAN-ENVIRONMENT GEOGRAPHY |     |
GEOG 300 | *SUSTAINABILITY FOR THE COMMON GOOD |     |
GEOG 350 | *GEOGRAPHY OF NATURAL DISASTERS |     |
GEOG 351 | *GLOBAL RESOURCES AND DEVELOPMENT |     |
HST 481 | *ENVIRONMENTAL HISTORY OF THE UNITED STATES |     |
OC 333 | OCEANS, COASTS, AND PEOPLE |     |
SUS 102 | *INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY |     |
SUS 350 | *SUSTAINABLE COMMUNITIES |     |
WGSS 440 | *WOMEN AND NATURAL RESOURCES |     |
WR 462 | *ENVIRONMENTAL WRITING |     |
Z 349 | *BIOCONSERVATION: CAUSES, CONSEQUENCES, AND CONSERVATION |     |

**Select one Environmental Management course:**

ANTH 481 | *NATURAL RESOURCES AND COMMUNITY VALUES | 3-4 |
CH 374 | *TECHNOLOGY, ENERGY, AND RISK |     |
ES 435 | *ENVIRONMENTAL RACISM |     |
ES 448/PHL 448/REL 448 | NATIVE AMERICAN PHILOSOPHIES |     |
FES 435/TOX 435 | *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK |     |
FES 485 | *CONSENSUS AND NATURAL RESOURCES |     |
FW 340 | *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES |     |
GEOG 309 | *ENVIRONMENTAL JUSTICE |     |
PHL 325 | *SCIENTIFIC REASONING |     |
PHL 439 | PHILOSOPHY OF NATURE |     |
PHL 440 | *ENVIRONMENTAL ETHICS |     |
PHL 445/REL 443 | *WORLD VIEW AND ENVIRONMENTAL VALUES |     |
PS 461 | ENVIRONMENTAL POLITICAL THEORY |     |
SOC 456 | *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT |     |
SOC 480 | *ENVIRONMENTAL SOCIOLOGY |     |
SOC 481 | *SOCIETY AND NATURAL RESOURCES |     |
WGSS 440 | *WOMEN AND NATURAL RESOURCES |     |

**Select one Environmental Economics and Policy course:**

AEC 250 | *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY |     |
AEC 253 | *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS |     |
AEC 351 | *NATURAL RESOURCE ECONOMICS AND POLICY |     |
AEC 352/ECON 352 | *ENVIRONMENTAL ECONOMICS AND POLICY |     |
AEC 432 | ENVIRONMENTAL LAW |     |
ECON 201 | *INTRODUCTION TO MICROECONOMY |     |
FOR 462 | NATURAL RESOURCE POLICY AND LAW |     |
FW 324 | *FOOD FROM THE SEA |     |
FW 415 | FISHERIES AND WILDLIFE LAW AND POLICY |     |
BOT 413/FOR 413 FOREST PATHOLOGY
ENT 331/HORT 331 *POLLINATORS IN PERIL
FES 350/HORT 350 URBAN FORESTRY
FES 355 MANAGEMENT FOR MULTIPLE RESOURCE VALUES
FES 365 *ISSUES IN NATURAL RESOURCES CONSERVATION
FES 412 FOREST ENTOMOLOGY
FES 445/FW 445 ECOCLOGICAL RESTORATION
FOR 346 TOPICS IN WILDLAND FIRE
FW 251 PRINCIPLES OF FISH AND WILDLIFE CONSERVATION
FW 323 MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST
FW 326 INTEGRATED WATERSHED MANAGEMENT
FW 435 *WILDLIFE IN AGRICULTURAL ECOSYSTEMS
FW 464 MARINE CONSERVATION BIOLOGY
GEO 306 *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT
GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 352/SOIL 352 *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT
GEOG 430 RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT
GEOG 440 WATER RESOURCES MANAGEMENT IN THE UNITED STATES
GEOG 441 INTERNATIONAL WATER RESOURCES MANAGEMENT
GEOG 452 SUSTAINABLE SITE PLANNING
NR 455 NATURAL RESOURCE DECISION MAKING
RNG 341 RANGELAND ECOLOGY AND MANAGEMENT
RNG 355 DESERT WATERSHED MANAGEMENT
RNG 421 WILDLAND RESTORATION AND ECOLOGY
RNG 455 RIPARIAN ECOHYDROLOGY AND MANAGEMENT
RNG 490 RANGELAND MANAGEMENT PLANNING
TRAL 352 WILDERNESS MANAGEMENT
Experiential Learning
Select 3 credits from the following:

- ENSC 401 RESEARCH AND SCHOLARSHIP
- ENSC 403 THESIS
- ENSC 410 ENVIRONMENTAL SCIENCE INTERNSHIP

Alternative Approved Courses:

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<tr>
<td>BRR 325</td>
<td>ENERGY TECHNOLOGY AND SOCIAL CHANGE</td>
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<td>BRR 350</td>
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<td>BRR 450</td>
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<td>ENGR 363</td>
<td>ENERGY MATTERS</td>
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<td>PH 313</td>
<td>ENERGY ALTERNATIVES</td>
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<tr>
<td>PS 473</td>
<td>US ENERGY POLICY</td>
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</table>

Total credits required for graduation 180

Specialization Area
Approved Certificate:
- Geographic Information Science (p. 330)

Approved Options (All options under the Environmental Sciences major):
- Alternative Energy (p. 323)
- Applied Ecology (p. 324)
- Aquatic Biology (p. 324)
- Conservation, Resources, and Sustainability (p. 325)
- Earth Systems (p. 326)
- Environmental Agriculture (p. 327)
- Environmental Policy and Economics (p. 328)
- Environmental Science Education (p. 328)
- Environmental Water Resources (p. 329)

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)

Major Code: 657

**Alternative Energy Option**

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

The Alternative Energy option draws from a variety of disciplines that offer courses in energy-related topics, not engineering. Students in this option will be well-informed about energy alternatives for work in urban and regional planning, city government, NGOs promoting energy alternatives to fossil fuels sources, power companies working with the public, policy-making in the energy field, and law school with an aim toward environmental law.

**Option Code: 842**

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<td>PS 473</td>
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Choose from the list below or additional core courses to total at least 27 credits:

- AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY
- AEC 432 ENVIRONMENTAL LAW
- ANTH 469 ENERGY IN CULTURAL PERSPECTIVE
- BA 432 *ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS
- ENGR 350 *SUSTAINABLE ENGINEERING
- GEO 306 *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT
- GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
- NSE 319 *SOCIETAL ASPECTS OF NUCLEAR TECHNOLOGY
- PPOL 441 *ENERGY AND SOCIETY
- PS 455 *THE POLITICS OF CLIMATE CHANGE
- PS 477 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
- PS 478 RENEWABLE ENERGY POLICY
- WSE 473 BIOENERGY AND ENVIRONMENTAL IMPACT

Total Hours 27

^ Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
Option Code: 842

Applied Ecology Option

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available at OSU-Cascades and via Ecampus.

The Applied Ecology option is for Environmental Sciences students who seek to orient their studies around ecology. This is applied ecology and therefore includes geographic methods for measuring and data collection in ecological change. Students seeking a concentration in policy and management are encouraged to consider the Conservation, Resources, and Sustainability option.

Option Code: 845

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<td>FOREST ECOLOGY</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Available at OSU-Cascades

Option Code: 844

Aquatic Biology Option

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

The Aquatic Biology option under the Environmental Sciences major offers students considerable depth in aquatic biology with course work possibilities that emphasize ecology in fresh, estuarine, and marine (saltwater) environments.

Option Code: 501

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<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
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<td>FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Available at OSU-Cascades
**Option Code: 501**

**Chemistry and the Environment Option**

**This option is offered within the following major(s):**

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

This program prepares students to pursue the chemistry of environmental issues. Knowledge of chemistry to apply to environmental issues ranging from water quality to soil contamination, pesticides to naturally occurring minerals, and chemical exchanges between the atmosphere, biota, water, soils, and the lithosphere is central to environmental science. Students with the knowledge and skills gained in this option will be prepared for field- and laboratory-based jobs in the private sector (consultancies and industry), government agencies, and non-governmental organizations, or to continue their education in graduate school.

**Option Code: 916**

**Conservation, Resources, and Sustainability Option**

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available at OSU-Cascades and via Ecampus.

The Conservation, Resources, and Sustainability option helps students to think in terms of conservation approaches, resource management, and sustainability as science and policy that combine as both personal endeavor and profession.

**Option Code: 843**

**Chemistry and the Environment Option**

**This option is offered within the following major(s):**

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

This program prepares students to pursue the chemistry of environmental issues. Knowledge of chemistry to apply to environmental issues ranging from water quality to soil contamination, pesticides to naturally occurring minerals, and chemical exchanges between the atmosphere, biota, water, soils, and the lithosphere is central to environmental science. Students with the knowledge and skills gained in this option will be prepared for field- and laboratory-based jobs in the private sector (consultancies and industry), government agencies, and non-governmental organizations, or to continue their education in graduate school.

**Option Code: 916**

**Conservation, Resources, and Sustainability Option**

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available at OSU-Cascades and via Ecampus.

The Conservation, Resources, and Sustainability option helps students to think in terms of conservation approaches, resource management, and sustainability as science and policy that combine as both personal endeavor and profession.
With the Earth Systems option, students will obtain a solid base in the sciences and they would be able to apply that base in an integrative way in order to build a strong knowledge traditionally referred to as natural history.

**Option Code: 848**

### Code Title Hours

#### Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ATS 201</td>
<td><em>CLIMATE SCIENCE</em></td>
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<tr>
<td>ATS 210</td>
<td>METEOROLOGY</td>
<td>4</td>
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<tr>
<td>ATS 411</td>
<td>THERMODYNAMICS AND CLOUD MICROPHYSICS</td>
<td>4</td>
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<td>ATS 412</td>
<td>ATMOSPHERIC RADIATION</td>
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<td>ATS 413</td>
<td>ATMOSPHERIC CHEMISTRY</td>
<td>3</td>
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<tr>
<td>ATS 420</td>
<td>PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE</td>
<td>4</td>
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<tr>
<td>ATS 421</td>
<td>CLIMATE MODELING</td>
<td>4</td>
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<tr>
<td>GEO 484</td>
<td>INTRODUCTION TO BIOGEOCHEMISTRY</td>
<td>3</td>
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<tr>
<td>GEO 323</td>
<td><em>CLIMATOLOGY</em></td>
<td>4</td>
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#### Environment

- GEO 305 | *LIVING WITH ACTIVE CASCADE VOLCANOES* | 3 |
- GEO 320 | *PHYSICAL GEOLOGY* | 4 |
- GEO 203 | *EVOLUTION OF PLANET EARTH* | 4 |
- GEO 308 | *GLOBAL CHANGE AND EARTH SCIENCES* | 3 |
- GEO 370 | *STRATIGRAPHY AND SEDIMENTOLOGY* | 4 |
- GEO 481 | GLACIAL GEOLOGY | 4 |
- GEO 486 | QUATERNARY PALEOClimatology | 3 |
- GEO 488 | QUATERNARY STRATIGRAPHY OF NORTH AMERICA | 3 |

#### Earth’s Surface

- FE 430 | WATERSHED PROCESSES | 4 |
- GEO 322 | SURFACE PROCESSES | 4 |
- GEO 340 | STRUCTURAL GEOLOGY | 4 |
- GEO 431 | ENVIRONMENTAL GEOCHEMISTRY | 3 |
- GEO 432 | APPLIED GEOMORPHOLOGY | 3 |
- GEO 433 | COASTAL GEOMORPHOLOGY | 3 |
- GEO 484 | INTRODUCTION TO BIOGEOCHEMISTRY | 3 |
- GEO 487 | HYDROGEOLOGY | 4 |
- GEO 423 | SNOW HYDROLOGY | 3 |

#### Oceans

- GEO 484 | INTRODUCTION TO BIOGEOCHEMISTRY | 3 |
- OC 201 | *OCEANOGRAPHY* | 4 |
- OC 332 | COASTAL OCEANOGRAPHY | 3 |
- OC 334 | *POLAR OCEANOGRAPHY* | 3 |
- OC 430 | PRINCIPLES OF PHYSICAL OCEANOGRAPHY | 4 |
- OC 433 | COASTAL AND ESTUARINE OCEANOGRAPHY | 3 |
- OC 434/FW 434 | ESTUARINE ECOLOGY | 4 |
- OC 440 | BIOLOGICAL OCEANOGRAPHY | 4 |
- OC 450 | CHEMICAL OCEANOGRAPHY | 4 |
- OC 460 | GEOLOGICAL OCEANOGRAPHY | 3 |

#### Soils

- CSS 205 | *SOIL SCIENCE* | 4 |
- or SOIL 205 | SOIL SCIENCE | 4 |
- or SOIL 206 & SOIL 206 | and *SOIL SCIENCE LABORATORY FOR SOIL 205 | 4 |
- SOIL 366 | ECOSYSTEMS OF WILDLAND SOILS | 3 |
- SOIL 435 | ENVIRONMENTAL SOIL PHYSICS | 3 |
- SOIL 445 | ENVIRONMENTAL SOIL CHEMISTRY | 3 |
- SOIL 455 | BIOLOGY OF SOIL ECOSYSTEMS | 4 |
- SOIL 466 | SOIL MORPHOLOGY AND CLASSIFICATION | 4 |
- SOIL 468 | SOIL LANDSCAPE ANALYSIS | 4 |

#### Human-Environment Interaction

- BI 347 | *OCEANS IN PERIL* | 3 |
- GEO 305 | *LIVING WITH ACTIVE CASCADE VOLCANOES* | 3 |

---

**Option Code: 843**

### Earth Systems Option

**This option is offered within the following major(s):**

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

**Also available via** Ecampus (http://ecampus.oregonstate.edu/).
GEO 306 *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT 3
GEO 307 *NATIONAL PARK GEOLOGY AND PRESERVATION 3
GEO 380 *EARTHQUAKES IN THE PACIFIC NORTHWEST 3
GEOG 324 *ECOLOGICAL BIOGEOGRAPHY 4
GEOG 350 *GEOGRAPHY OF NATURAL HAZARDS 3
GEOG 430 *RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT 3
GEOG 431 GLOBAL RESOURCES AND DEVELOPMENT 3
GEOG 432 *GEOGRAPHY OF FOOD AND AGRICULTURE 3
GEOG 440 WATER RESOURCES MANAGEMENT IN THE UNITED STATES 3
GEOG 441 INTERNATIONAL WATER RESOURCES MANAGEMENT 3
GEOG 450 LAND USE IN THE AMERICAN WEST 3
OC 333 OCEANS, COASTS, AND PEOPLE 3

Methods
ATS 295 OBSERVING CLIMATE 3
GEOG 201 *FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS 4
GEOG 295 INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH 3
GEOG 360 GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY 4
GEOG 370 GEOVISUALIZATION: CARTOGRAPHY 4
GEOG 480 REMOTE SENSING I: PRINCIPLES AND APPLICATIONS 4

Total credits 27

Students should select an additional course in atmosphere, hydrosphere, and geosphere from the approved list in the Environmental Sciences and Humanities core (minimum of 11 credits)

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 848

Environmental Agriculture Option

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

The Environmental Agriculture option has a core of agricultural sciences courses and includes a variety of course possibilities in the areas of agricultural ecology and production, as well as societal issues related to agriculture and environmental science.

Option Code: 849

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td>Core</td>
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<td>Select a minimum of 6-8 credits from the following:</td>
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<td>AGRI 411</td>
<td>*INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL</td>
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<td>ANS 121</td>
<td>*INTRODUCTION TO ANIMAL SCIENCES</td>
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<tr>
<td>BI 311</td>
<td>GENETICS</td>
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<tr>
<td>CROP 280</td>
<td>INTRODUCTION TO THE COMPLEXITY OF OREGON CROPPING SYSTEMS</td>
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<td>CROP 300/HORT 300</td>
<td>CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS</td>
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<td>or CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
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<td>or SOIL 205 &amp; SOIL 206</td>
<td>SOIL SCIENCE and *SOIL SCIENCE LABORATORY FOR SOIL 205</td>
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<td>ENT 311</td>
<td>INTRODUCTION TO INSECT PEST MANAGEMENT</td>
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<td>HORT 260</td>
<td>ORGANIC FARMING AND GARDENING</td>
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<td>HORT 301</td>
<td>GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS</td>
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<td>SOIL 395</td>
<td>**WORLD SOIL RESOURCES</td>
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<td></td>
<td>Ecology and Production</td>
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<td>Select a minimum of 9 credits from the following:</td>
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<td>AGRI 438</td>
<td>EXPLORING WORLD AGRICULTURE</td>
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<td>ANS 215</td>
<td>BEEF/DAIRY INDUSTRIES</td>
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<tr>
<td>ANS 216</td>
<td>SMALL RUMINANT/SWINE INDUSTRIES</td>
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<td>ANS 217</td>
<td>POULTRY INDUSTRIES</td>
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<td>BEE 439</td>
<td>IRRIGATION PRINCIPLES AND PRACTICES</td>
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<td>BOT 313</td>
<td>PLANT STRUCTURE</td>
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<td>BOT 350</td>
<td>INTRODUCTORY PLANT PATHOLOGY</td>
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<td>CROP 310</td>
<td>FORAGE PRODUCTION</td>
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<td>CROP 319</td>
<td>PRINCIPLES OF FIELD CROP PRODUCTION</td>
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<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
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<td>ENT 322</td>
<td>HONEY BEE BIOLOGY AND BEEKEEPING</td>
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<tr>
<td>FES 350/HORT 350</td>
<td>URBAN FORESTRY</td>
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<tr>
<td>FES 477/NS 477</td>
<td>*AGROFORESTRY</td>
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<td>HORT 226</td>
<td>LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS</td>
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<td>HORT 228</td>
<td>LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING TREES AND SHRUBS</td>
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<tr>
<td>HORT 285</td>
<td>PERMACULTURE DESIGN AND THEORY: CERTIFICATE COURSE</td>
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<td>HORT 311</td>
<td>PLANT PROPAGATION</td>
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<td>HORT 314</td>
<td>PRINCIPLES OF TURFGRASS MAINTENANCE</td>
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<td>HORT 315</td>
<td>SUSTAINABLE LANDSCAPES: MAINTENANCE, CONSERVATION, RESTORE</td>
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<td>HORT 316</td>
<td>PLANT NUTRITION</td>
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<td>HORT 351</td>
<td>FLORICULTURE AND GREENHOUSE SYSTEMS</td>
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<td>HORT 361</td>
<td>PLANT NURSERY SYSTEMS</td>
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<td>HORT 380</td>
<td>SUSTAINABLE LANDSCAPE DESIGN</td>
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<td>PBI 431</td>
<td>PLANT GENETICS RECITATION</td>
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<td>RNG 442</td>
<td>RANGELAND-ANIMAL RELATIONS</td>
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Societal Issues

Select a minimum of 6 credits from the following:

AEC 372 AGRICULTURAL COOPERATIVES
AEC 442 AGRICULTURAL BUSINESS MANAGEMENT
ANS 315 *CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE
ANTH 361/FCSJ 361 *FOOD JUSTICE
ANTH 486/FCSJ 486 ANTHROPOLOGY OF FOOD
CROP 330 *WORLD FOOD CROPS
ENT 331/HORT 331 *POLLINATORS IN PERIL
FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
GEOG 420 *GEOGRAPHY OF FOOD AND AGRICULTURE
HORT 319 RESTORATION HORTICULTURE
HORT 330/ENT 300 *PLAGUES, PESTS, AND POLITICS
SUS 350 *SUSTAINABLE COMMUNITIES
400-level CROP, ENT, HORT courses may be added in consultation with an advisor

* Baccalaureate Core Course (BCC)

Option Code: 849
Environmental Policy and Economics Option

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available via Ecampus (https://ecampus.oregonstate.edu/).

The Environmental Conservation and Sustainability option is for students interested in environmental law, policy and advocacy.

Option Code: 844

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<thead>
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<tr>
<td>AEC 351</td>
<td>*NATURAL RESOURCE ECONOMICS AND POLICY</td>
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<tr>
<td>or AEC 352</td>
<td>*ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<tr>
<td>or ECON 352</td>
<td>*ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
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<tr>
<td>PS 475</td>
<td>ENVIRONMENTAL POLICIES AND POLICY</td>
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Electives

Select a minimum of 16 credits of the following:

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<tr>
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<tr>
<td>AEC 311</td>
<td>INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS</td>
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<tr>
<td>AEC 313</td>
<td>INTERMEDIATE APPLIED ECONOMICS II: MARKETS, WELFARE &amp; POLICY</td>
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<tr>
<td>AEC 353</td>
<td>*INTRODUCTION TO COASTAL AND MARINE RESOURCE ECONOMICS</td>
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<td>AEC 434</td>
<td>*MEASURING RESOURCE AND ENVIRONMENTAL IMPACTS</td>
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<tr>
<td>AEC 448</td>
<td>ADVANCED TOPICS IN ENVIRONMENTAL AND RESOURCE ECONOMICS</td>
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<tr>
<td>AEC 452</td>
<td>MARINE ECONOMICS</td>
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<tr>
<td>AEC 454</td>
<td>RURAL DEVELOPMENT ECONOMICS AND POLICY</td>
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<tr>
<td>AEC 461</td>
<td>*AGRICULTURAL AND FOOD POLICY ISSUES</td>
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<td>ECON 311</td>
<td>INTERMEDIATE MICROECONOMIC THEORY</td>
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<td>ECON 428</td>
<td>*INTRODUCTION TO ECONOMIC RESEARCH</td>
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<td>ECON 435</td>
<td>PUBLIC ECONOMICS</td>
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<td>ECON 439</td>
<td>*PUBLIC POLICY ANALYSIS</td>
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<td>ECON 446</td>
<td>*ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY</td>
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<td>AEC 432</td>
<td>ENVIRONMENTAL LAW</td>
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<tr>
<td>AEC 452</td>
<td>MARINE ECONOMICS</td>
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<tr>
<td>FOR 460</td>
<td>*FOREST POLICY</td>
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<td>FOR 462</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
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<td>FW 415</td>
<td>FISHERIES AND WILDLIFE LAW AND POLICY</td>
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<td>FW 422</td>
<td>INTRODUCTION TO OCEAN LAW</td>
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<tr>
<td>PPOL 441</td>
<td>*ENERGY AND SOCIETY</td>
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<tr>
<td>PPOL 446</td>
<td>THE POLICY AND LAW OF U.S. COASTAL GOVERNANCE</td>
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<td>PPOL 447</td>
<td>INTEGRATED POLICY: FOOD, ENERGY WATER, CLIMATE</td>
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<td>PPOL 448</td>
<td>MARINE POLICY IN THE UNITED STATES</td>
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<tr>
<td>PS 311</td>
<td>CONGRESSIONAL POLITICS</td>
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<td>PS 314</td>
<td>INTEREST GROUP POLITICS</td>
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<tr>
<td>PS 315</td>
<td>*THE POLITICS OF MEDIA</td>
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<td>PS 331</td>
<td>*STATE AND LOCAL POLITICS</td>
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<td>PS 455</td>
<td>*THE POLITICS OF CLIMATE CHANGE</td>
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<td>PS 461</td>
<td>ENVIRONMENTAL POLITICAL THEORY</td>
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<td>PS 473</td>
<td>US ENERGY POLICY</td>
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<td>PS 476</td>
<td>*SCIENCE AND POLICIES</td>
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<td>PS 477</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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<td>PS 478</td>
<td>RENEWABLE ENERGY POLICY</td>
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Applications

- BEE 411 GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS
- FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
- FES 485 *CONSensus AND NATURAL RESOURCES
- FOR 330 FOREST RESOURCE ECONOMICS I
- FW 340 *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES
- GEO 309 *ENVIRONMENTAL JUSTICE
- GEOG 330 **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION
- GEOG 331 *POPULATION, CONSUMPTION, AND ENVIRONMENT
- GEOG 430 RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT
- GEOG 431 GLOBAL RESOURCES AND DEVELOPMENT
- GEOG 440 WATER RESOURCES MANAGEMENT IN THE UNITED STATES
- GEOG 441 INTERNATIONAL WATER RESOURCES MANAGEMENT
- GEOG 450 **LAND USE IN THE AMERICAN WEST
- HST 481 *ENVIRONMENTAL HISTORY OF THE UNITED STATES
- PS 455 *THE POLITICS OF CLIMATE CHANGE
- SOC 360 *POPULATION TRENDS AND POLICY
- SOC 480 *ENVIRONMENTAL SOCIOLOGY
- SOC 481 *SOCIETY AND NATURAL RESOURCES

Total Hours: 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Environmental Science Education Option

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

The Environmental Science Education option in Environmental Sciences prepares students for entry into OSU’s Education Double Degree Program or the MS Professional Teacher Education Program. Environmental Sciences students preparing to teach in secondary school can choose either to pursue a state endorsement in Integrated Science (to teach any middle school science class or high school environmental science, earth science, or another course that is not biology, chemistry, or physics) or Biology, for all secondary biology classes. Students should consult the Content Mastery Sheets for these subjects that are provided by the OSU College of Education. The courses required are subject to change.

Option Code: 846

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<td>SED 406</td>
<td>PROJECTS</td>
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<td>ED 309</td>
<td>FIELD PRACTICUM</td>
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### Education Courses

Select 6 credits of the following:

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<th>Title</th>
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<td>ED 216</td>
<td>*PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
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<td>ED 219</td>
<td>CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
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<tr>
<td>SED 412</td>
<td>TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE</td>
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<tr>
<td>SED 413</td>
<td>INQUIRY IN SCIENCE AND SCIENCE EDUCATION</td>
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### Human Development Course

Select 3-4 credits of the following:

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<tr>
<td>ED 253</td>
<td>LEARNING ACROSS THE LIFESPAN</td>
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<tr>
<td>HDFS 313</td>
<td>ADOLESCENT DEVELOPMENT</td>
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### Special Course Requirement

Select one of the following:

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<tr>
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<tr>
<td>ED 216</td>
<td>*PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
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<tr>
<td>ED 219</td>
<td>CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
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<tr>
<td>ED 253</td>
<td>LEARNING ACROSS THE LIFESPAN</td>
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### Double Degree Program

Select 14-15 upper-division science credits

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<th>Code</th>
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<tbody>
<tr>
<td>FE 430</td>
<td>WATERSHED PROCESSES</td>
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<tr>
<td>or FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
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<tr>
<td>GEO 487</td>
<td>HYDROGEOLOGY</td>
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<td>GEOG 424</td>
<td>HYDROLOGY FOR WATER RESOURCES MANAGEMENT</td>
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### Upper-Division Science

Select 14-15 upper-division science credits

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<tbody>
<tr>
<td>BI 311</td>
<td>GENETICS (recommended but not required)</td>
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<tr>
<td>BI 445</td>
<td>EVOLUTION (recommended but not required)</td>
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Environmental Sciences students seeking an endorsement in Integrated Science must select the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 323</td>
<td>*CLIMATOLOGY</td>
<td></td>
</tr>
<tr>
<td>GEO 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
<td></td>
</tr>
<tr>
<td>GEO 203</td>
<td>*EVOLUTION OF PLANET EARTH</td>
<td></td>
</tr>
<tr>
<td>or GEO 308</td>
<td>*GLOBAL CHANGE AND EARTH SCIENCES</td>
<td></td>
</tr>
<tr>
<td>OC 201</td>
<td>*OCEANOGRAPHY</td>
<td></td>
</tr>
</tbody>
</table>

Environmental Sciences students seeking an endorsement in Biology must select the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td></td>
</tr>
</tbody>
</table>

### Total Hours

30-37

1 In consultation with your advisor, select additional upper-division science courses from Atmospheric Sciences (ATS), Biochemistry and Biophysics (BB), Botany (BOT), Geology (GEO), History of Science (HSTS), Microbiology (MB), Oceanography (OC) or Zoology (Z).

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

### Special Course Requirements by Program:

Environmental Sciences students preparing to teach in secondary school can choose either to pursue a state endorsement in Integrated Science (to teach any middle school science class or high school environmental science, earth science, or another course at is not biology, chemistry, or physics) or Biology, for all secondary biology classes. Students should consult the Content Mastery Sheets for these subjects that are provided by the OSU College of Education. The courses required are subject to change.

### Option Code: 846

**Environmental Water Resources Option**

This option is offered within the following major(s):

- Environmental Sciences - College of Earth, Ocean, and Atmospheric Sciences (p. 321)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

The Environmental Sciences BS with the option in Water Resources provides a solid science base for domestic and international work related to water.

### Option Code: 847

The option requires a minimum of 27 credits from the three categories below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE 430</td>
<td>WATERSHED PROCESSES</td>
<td>4</td>
</tr>
<tr>
<td>or FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>GEO 487</td>
<td>HYDROGEOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 424</td>
<td>HYDROLOGY FOR WATER RESOURCES MANAGEMENT</td>
<td>3</td>
</tr>
</tbody>
</table>

### Sciences

Select a minimum of two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEE 458</td>
<td>NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL</td>
<td>3</td>
</tr>
<tr>
<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
<td>5</td>
</tr>
<tr>
<td>FW 479</td>
<td>WETLANDS AND RIPARIAN ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>GEO 322</td>
<td>SURFACE PROCESSES</td>
<td>4</td>
</tr>
<tr>
<td>GEO 432</td>
<td>APPLIED GEOMORPHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 323</td>
<td>*CLIMATOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 423</td>
<td>SNOW HYDROLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>

### Resources and Policy

Select a minimum of two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC 251</td>
<td>*NATURAL RESOURCE ECONOMICS AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>AEC 252/ECON 352</td>
<td>*ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>ENVE 456</td>
<td>SUSTAINABLE WATER RESOURCES DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 430</td>
<td>RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 440</td>
<td>WATER RESOURCES MANAGEMENT IN THE UNITED STATES</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 441</td>
<td>INTERNATIONAL WATER RESOURCES MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 452</td>
<td>SUSTAINABLE SITE PLANNING</td>
<td>3</td>
</tr>
<tr>
<td>OC 333</td>
<td>OCEANS, COASTS, AND PEOPLE</td>
<td>3</td>
</tr>
<tr>
<td>RNG 355</td>
<td>DESERT WATERSHED MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>RNG 455</td>
<td>RIPARIAN ECOCYHROLOGY AND MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

### Option Code: 847
Oregon State University offers an undergraduate and graduate certificate in Geographic Information Science. Geographic Information Science (GIScience) is a discipline that combines theory and principles underlying:

- geospatial data collection (remotely sensed imagery from satellites, aircraft, and drones, social media, telemetry, GPS, etc.);
- technologies to manage, analyze, and visualize geospatial data (geographic information systems);
- computational, statistical, and mathematical methods to analyze and model geospatial data (machine learning, Big Data, spatial statistics, spatial modeling, geovisual analytics, etc.);
- digital cartography and geovisualization (the science and practice of creating maps); and
- cognitive, social, and environmental implications of GIScience (professional ethics, privacy, digital divide, etc.).

The OSU GIScience certificate can help lead to certification as a nationally-recognized geographic information systems (GIS) professional (GISP). GIS professionals are in high demand for jobs in government, NGOs, and the private sector, and have rewarding careers in natural resource management, online and interactive mapping, business, planning, and many others.

Certificate Code: C540

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FE 208</td>
<td>FOREST SURVEYING</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 201</td>
<td>FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 370</td>
<td>GEOVISUALIZATION: CARTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 480</td>
<td>REMOTE SENSING I: PRINCIPLES AND APPLICATIONS (EC)</td>
<td>4</td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>GEOG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
<td></td>
</tr>
<tr>
<td>FE 257</td>
<td>GIS AND FOREST ENGINEERING APPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>CE 202</td>
<td>CIVIL ENGINEERING: GEOSPATIAL INFORMATION AND GIS</td>
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</tr>
<tr>
<td>Electives</td>
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<td>7-8</td>
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<tr>
<td>Select 7-8 credits from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE 413</td>
<td>GIS IN WATER RESOURCES</td>
<td></td>
</tr>
<tr>
<td>CROP 414/HORT 414</td>
<td>PRECISION AGRICULTURE</td>
<td></td>
</tr>
<tr>
<td>ECE 468</td>
<td>DIGITAL IMAGE PROCESSING</td>
<td></td>
</tr>
</tbody>
</table>

Certificate Code: C540

Geographic Information Science Graduate Certificate

Also available via Ecampus.

Kuuipo Walsh, Director
GIScience Certificate Program
134 Wilkinson Hall
College of Earth, Ocean, and Atmospheric Sciences
Oregon State University
Corvallis, OR 97331
541-737-3795
FAX 541-737-1200
Email: kuuipo.walsh@oregonstate.edu
Website: http://ceoas.oregonstate.edu/giscience/

Oregon State University offers an undergraduate and graduate certificate in Geographic Information Science. Geographic Information Science (GIScience) is a discipline that combines theory and principles underlying:

- geospatial data collection (remotely sensed imagery from satellites, aircraft, and drones, social media, telemetry, GPS, etc.);
- technologies to manage, analyze, and visualize geospatial data (geographic information systems);
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The OSU GIScience certificate can help lead to certification as a nationally-recognized geographic information systems (GIS) professional (GISP). GIS professionals are in high demand for jobs in government, NGOs, and the private sector, and have rewarding careers in natural resource management, online and interactive mapping, business, planning, and many others.

Certificate Code: CG03

Students must have completed the following background course or have equivalent experience: introductory cartography (GEOG 370). This course can either be completed prior to starting the certificate program or pursued in tandem with the other courses in the certificate.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 370</td>
<td>GEOVISUALIZATION: CARTOGRAPHY (EC)</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 560</td>
<td>GISCIENCE I: INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE (EC)</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 580</td>
<td>REMOTE SENSING I: PRINCIPLES AND APPLICATIONS (EC)</td>
<td>4</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Electives</th>
<th>Select 11 credits from the following:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 513</td>
<td>GIS IN WATER RESOURCES</td>
<td></td>
</tr>
<tr>
<td>CE 562</td>
<td>DIGITAL TERRAIN MODELING</td>
<td></td>
</tr>
<tr>
<td>CE 566</td>
<td>3D LASER SCANNING AND IMAGING</td>
<td></td>
</tr>
<tr>
<td>CS 553</td>
<td>SCIENTIFIC VISUALIZATION</td>
<td></td>
</tr>
<tr>
<td>CS 554</td>
<td>GEOMETRIC MODELING IN COMPUTER GRAPHICS</td>
<td></td>
</tr>
<tr>
<td>FE 523</td>
<td>UNMANNED AIRCRAFT SYSTEM REMOTE SENSING</td>
<td></td>
</tr>
<tr>
<td>FOR 510/GEOG 510</td>
<td>INTERNSHIP (1 or more credits with advisor approval [EC])</td>
<td>9</td>
</tr>
</tbody>
</table>

| GEOG 551 | PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES | 9 |
| GEOG 561 | GISCIENCE II: ANALYSIS AND APPLICATIONS (EC) | 9 |
| GEOG 562 | GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS (EC) | 9 |
| GEOG 563 | GISCIENCE IV: SPATIAL MODELING | 9 |
| GEOG 564 | GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS (EC) | 9 |
| GEOG 565 | SPATIO-TEMPORAL VARIATION IN ECOLOGY AND EARTH SCIENCE | 9 |
| GEOG 566 | ADVANCED SPATIAL STATISTICS AND GISCIENCE | 9 |
| GEOG 571 | GEOVISUALIZATION: WEB MAPPING | 9 |
| GEOG 572 | GEOVISUALIZATION: GEOVISUAL ANALYTICS | 9 |
| GEOG 581 | REMOTE SENSING II: WEB MAPPING | 9 |
| H 547    | GIS AND PUBLIC HEALTH                            | 9 |
| H 592    | SPATIAL EPIDEMIOLOGY                            | 9 |
| OC 678   | OCEAN REMOTE SENSING                            | 9 |
| SOIL 568 | SOIL LANDSCAPE ANALYSIS                        | 9 |
| ST 555   | TIME SERIES                                     | 9 |
| ST 567   | SPATIAL STATISTICS                              | 9 |

The following courses may count towards elective credits after consulting with and receiving approval from the program director:

| CE 501   | RESEARCH                                        |       |
| CE 560   | SELECTED TOPICS IN GEOMATICS ENGINEERING        |       |
| CS 519   | SELECTED TOPICS IN COMPUTER SCIENCE             |       |
| CS 549   | SELECTED TOPICS ON DATA SCIENCE & SYSTEMS       |       |
| GEOG 501 | RESEARCH                                        |       |
| GEOG 501 | RESEARCH                                        |       |
| GEOG 599 | SPECIAL STUDIES                                 |       |
| GEOG 699 | SPECIAL STUDIES                                 |       |

EC Course can also be completed through Ecampus

Certificate Code: CG03

Geography and Geospatial Science Undergraduate Major (BS, HBS)

Also available via Ecampus.

Geography is a scientific approach to understanding people's relationship with their environment and resources. Geography is central to many important issues, including planning for land-use change, global studies, and adaptation to climate change. Geospatial science applies techniques, including web mapping, geovisualization, remote sensing, and geographic information systems (GIS), to address these issues. Geographic thinking and geospatial technology are present in every aspect of modern life, and career opportunities abound for students trained in geography and geospatial science.

Major Code: 896

Students majoring in Geography and Geospatial Science complete work in five major areas:

1. OSU's baccalaureate core
2. Basic statistics and math
3. Geography and Geospatial Science core
4. Electives
5. Experiential learning (field courses and internship or research)

The major consists of 85 credits of course work. In addition to baccalaureate core courses, the major consists of:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MTH 112</td>
<td>ELEMENTARY FUNCTIONS</td>
<td>4</td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
<tr>
<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
</tbody>
</table>

Supporting Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Foundational Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Baccalaureate Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Supporting Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Foundational Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Electives

<table>
<thead>
<tr>
<th>Select 11 credits from the following:</th>
<th></th>
</tr>
</thead>
</table>

Supporting mathematics and statistics | 12 |
Foundational skills in geography and geospatial science | 17 |
Upper-division geospatial science | 12 |
Experiential learning | 9 |
Seminar | 1 |
Upper-division electives | 31 |
Capstone course | 3 |

Total Hours | 85 |

Baccalaureate Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Supporting Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Foundational Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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</table>

Electives

<table>
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<tr>
<th>Select 11 credits from the following:</th>
<th></th>
</tr>
</thead>
</table>

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Foundational skills in geography and geospatial science | 17 |
Upper-division geospatial science | 12 |
Experiential learning | 9 |
Seminar | 1 |
Upper-division electives | 31 |
Capstone course | 3 |

Total Hours | 85 |

Baccalaureate Core

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Supporting Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Foundational Skills

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>

Electives

<table>
<thead>
<tr>
<th>Select 11 credits from the following:</th>
<th></th>
</tr>
</thead>
</table>

Supporting mathematics and statistics | 12 |
Foundational skills in geography and geospatial science | 17 |
Upper-division geospatial science | 12 |
Experiential learning | 9 |
Seminar | 1 |
Upper-division electives | 31 |
Capstone course | 3 |

Total Hours | 85 |
## Upper-Division Geospatial Science Techniques and Problem-Solving

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
<td>4</td>
</tr>
<tr>
<td>GEG 370</td>
<td>GEOVISUALIZATION: CARTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>GEG 480</td>
<td>REMOTE SENSING I: PRINCIPLES AND APPLICATIONS</td>
<td>4</td>
</tr>
</tbody>
</table>

### Seminar

**GEG 407** SEMINAR 1

### Experiential Learning

- **GEG 295** INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH 3
- **GEG 410** INTERNSHIP 1 (GEG 410 online) 3
  - or **GEG 401** RESEARCH
  - or **GEG 403** THESIS
- **GEG 495** FIELD GEOGRAPHY SYNTHESIS 3

### Capstone

- **GEG 464** GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS 3

### Upper-Division Geography and Geospatial Science Electives

- **GEG 323** *CLIMATOLOGY 1 (GEG 323 online) 4
  - or **GEG 324** *ECOLOGICAL BIOGEOGRAPHY

Select 27 credits from the following lists with at least five courses at 400 level: 27

#### Geospatial Science

- **GEG 361** GISCENCE II: ANALYSIS AND APPLICATIONS
- **GEG 371** GEOVISUALIZATION: WEB MAPPING
- **GEG 462** GISCENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS
- **GEG 463** GISCENCE IV: SPATIAL MODELING
- **GEG 472** GEOVISUALIZATION: GEOSpatial ANALYTICS 1
- **GEG 481** REMOTE SENSING II: DIGITAL IMAGE PROCESSING

#### International Studies

- **GEG 311** *GEOGRAPHY OF AFRICA 1
- **GEG 313** *GEOGRAPHY OF ASIA
- **GEG 314** *GEOGRAPHY OF LATIN AMERICA 1
- **GEG 330** **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION 1

#### Water Resources

- **GEG 340** INTRODUCTION TO WATER SCIENCE AND POLICY
- **GEG 423** SNOW HYDROLOGY 1
- **GEG 424** HYDROLOGY FOR WATER RESOURCES MANAGEMENT 1
- **GEG 440** WATER RESOURCES MANAGEMENT IN THE UNITED STATES
- **GEG 441** INTERNATIONAL WATER RESOURCES MANAGEMENT

#### Resources, Hazards, and Planning

- **GEG 300** SUSTAINABILITY FOR THE COMMON GOOD
- **GEG 331** POPULATION, CONSUMPTION, AND ENVIRONMENT
- **GEG 350** GEOGRAPHY OF NATURAL HAZARDS
- **GEG 430** RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT 1
- **GEG 432** GEOGRAPHY OF FOOD AND AGRICULTURE 1
- **GEG 450** LAND USE IN THE AMERICAN WEST 1
- **GEG 451** PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES
- **GEG 452** SUSTAINABLE SITE PLANNING

### Total credits required for graduation 180

- * Baccalaureate Core Course (BCC)
- ^ Writing Intensive Course (WIC)
- 1 Not available via Ecampus

**Major Code: 896**

---

### Sample Four-Year Plan: Geography and Geospatial Science

#### Course Title

<table>
<thead>
<tr>
<th>First Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GEG 102</strong></td>
</tr>
<tr>
<td>or <strong>GEG 202</strong></td>
</tr>
<tr>
<td><strong>GEG 103</strong></td>
</tr>
<tr>
<td>or <strong>GEG 203</strong></td>
</tr>
<tr>
<td><strong>GEG 105</strong></td>
</tr>
<tr>
<td>or <strong>GEG 106</strong></td>
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<tr>
<td><strong>MTH 112</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
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</tbody>
</table>

#### Second Year

| **GEG 201** | FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS 4 |
| **GEG 240** | CLIMATE CHANGE, WATER AND SOCIETY 3 |
| or **GEG 250** | LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES 3 |
| or **GEG 251** | *GEOGRAPHY OF DISASTER MANAGEMENT 3 |
| **GEG 295** | INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH 3 |
| **ST 351** | INTRODUCTION TO STATISTICAL METHODS 4 |
| **ST 352** | INTRODUCTION TO STATISTICAL METHODS 4 |

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
</tr>
</tbody>
</table>

#### Third Year

**Fall**

| **GEG 300** | SUSTAINABILITY FOR THE COMMON GOOD 3 |
| or **GEG 331** | POPULATION, CONSUMPTION, AND ENVIRONMENT 3 |
| or **GEG 340** | INTRODUCTION TO WATER SCIENCE AND POLICY 3 |
| **GEG 360** | GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY 4 |
| **GEG 370** | GEOVISUALIZATION: CARTOGRAPHY 4 |

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

**Winter**

| **GEG 300** | SUSTAINABILITY FOR THE COMMON GOOD 3 |
| or **GEG 330** | GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION 3 |
| or **GEG 350** | GEOGRAPHY OF NATURAL HAZARDS 3 |
| **GEG 361** | GISCIENCE II: ANALYSIS AND APPLICATIONS 4 |
| **GEG 371** | GEOVISUALIZATION: WEB MAPPING 4 |
| **GEG 423** | SNOW HYDROLOGY 3 |
| or **GEG 424** | HYDROLOGY FOR WATER RESOURCES MANAGEMENT 3 |
| or **GEG 441** | INTERNATIONAL WATER RESOURCES MANAGEMENT 3 |

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**Spring**

| **GEG 300** | SUSTAINABILITY FOR THE COMMON GOOD 3 |
| or **GEG 330** | INTRODUCTION TO WATER SCIENCE AND POLICY 3 |
| or **GEG 440** | WATER RESOURCES MANAGEMENT IN THE UNITED STATES 3 |
| **GEG 323** | CLIMATOLOGY 4 |
| or **GEG 324** | ECOLOGICAL BIOGEOGRAPHY 4 |
| **GEG 431** | GLOBAL RESOURCES AND DEVELOPMENT 3 |
| or **GEG 432** | GEOGRAPHY OF FOOD AND AGRICULTURE 3 |
| **GEG 462** | GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS 4 |
| or **GEG 472** | GEOVISUALIZATION: GEOVISUAL ANALYTICS 4 |

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#### Fourth Year

**Fall**

| **GEG 407** | SEMINAR 1 |
| **GEG 440** | WATER RESOURCES MANAGEMENT IN THE UNITED STATES 3 |
| or **GEG 453** | GISCIENCE IV: SPATIAL MODELING 3 |

<table>
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Sample Two-Year Plan: Geography and Geospatial Science

Up to 29 transfer credits may be accepted representing the equivalent of:

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<td>or GEO 202</td>
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<tr>
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<td>*HUMAN GEOGRAPHY</td>
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<tr>
<td>or GEO 203</td>
<td>*HUMAN-ENVIRONMENT GEOGRAPHY</td>
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<td>*GEOGRAPHY OF THE NON-WESTERN WORLD</td>
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<td>*GEOGRAPHY OF THE WESTERN WORLD</td>
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<td>*FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS</td>
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<td>GEOG 240</td>
<td>*CLIMATE CHANGE, WATER AND SOCIETY</td>
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<tr>
<td>or GEOG 250</td>
<td>LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES</td>
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<td>or GEOG 251</td>
<td>GEOGRAPHY OF DISASTER MANAGEMENT</td>
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<td>or ST 351</td>
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<td>&amp; ST 352</td>
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Total Hours 29

Course Title Hours

Third Year

Fall

GEOG 295 INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH 3

GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD 3
| or GEOG 331 | or *POPULATION, CONSUMPTION, AND ENVIRONMENT                  |  |
| or GEOG 340 | or *INTRODUCTION TO WATER SCIENCE AND POLICY                   |  |
| GEOG 360 | GSCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY          | 4     |
| GEOG 370 | GEOVISUALIZATION: CARTOGRAPHY                                   | 4     |

Winter

GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD 3
| or GEOG 330 | or *GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION |  |
| or GEOG 350 | or *GEOGRAPHY OF NATURAL HAZARDS                               |  |
| GEOG 361 | GSCIENCE II: ANALYSIS AND APPLICATIONS                         | 4     |
| GEOG 371 | GEOVISUALIZATION: WEB MAPPING                                   | 4     |
| GEOG 423 | SNOW HYDROLOGY                                                 | 3     |
| or GEOG 424 | or HYDROLOGY FOR WATER RESOURCES                                |  |
| or GEOG 441 | or MANAGEMENT                                                  |  |
| or GEOG 451 | or INTERNATIONAL WATER RESOURCES MANAGEMENT                    |       |

Spring

GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD 3
| or GEOG 340 | or *INTRODUCTION TO WATER SCIENCE AND POLICY                   |  |
| or GEOG 440 | or WATER RESOURCES MANAGEMENT IN THE UNITED STATES             |  |
| GEOG 323 | *CLIMATOLOGY                                                    | 4     |
| or GEOG 324 | or *ECOLOGICAL BIOGEOGRAPHY                                    |  |
| GEOG 431 | GLOBAL RESOURCES AND DEVELOPMENT                                | 3     |
| or GEOG 432 | or *GEOGRAPHY OF FOOD AND AGRICULTURE                         |  |
| GEOG 462 | GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS              | 4     |
| or GEOG 472 | or GEOVISUALIZATION: GEOVISUAL ANALYTICS                       |       |

Fourth Year

Fall

GEOG 440 WATER RESOURCES MANAGEMENT IN THE UNITED STATES 3
| or GEOG 463 | or GSCIENCE IV: SPATIAL MODELING                               |  |
| GEOG 480 | REMOTE SENSING I: PRINCIPLES AND APPLICATIONS                   | 4     |
| GEOG 407 | SEMINAR                                                       | 1-16   |

Winter

GEOG 410 INTERNSHIP 1-16
| or GEOG 401 | or RESEARCH                                                    |  |
| or GEOG 403 | or THESIS                                                      |  |
| GEOG 423 | SNOW HYDROLOGY                                                 | 3     |
| or GEOG 424 | or HYDROLOGY FOR WATER RESOURCES                                |  |
| or GEOG 441 | or MANAGEMENT                                                  |  |
| or GEOG 451 | or INTERNATIONAL WATER RESOURCES MANAGEMENT                    |       |
| GEOG 481 | REMOTE SENSING II: DIGITAL IMAGE PROCESSING                     | 4     |

Spring

GEOG 430 RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT 3
| or GEOG 440 | or WATER RESOURCES MANAGEMENT IN THE UNITED STATES             |  |
| or GEOG 452 | or WATER RESOURCES MANAGEMENT IN THE UNITED STATES             |  |
| or GEOG 472 | or SUSTAINABLE SITE PLANNING                                    |  |
| or GEOG 464 | or GEOVISUALIZATION: GEOVISUAL ANALYTICS                       |       |
| GEOG 495 | FIELD GEOGRAPHY SYNTHESIS                                      | 3     |

Total Hours 67-97

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)
**Geography Graduate Major (MS, PhD)**

**Graduate Areas of Concentration**

*Geographic information science, physical geography, resource geography*

Geography is the study of human use and interaction with the Earth and the identification of spatial and temporal variation in natural and human processes. Geography uses principles of mathematics, social science, and natural science to analyze and interpret change in the environment. Many geographic studies require a combination of field, laboratory, and computational work. Geography plays an important role in urban and land use planning, resource evaluation, environmental analysis, education, and cartography.

Majors in geography develop a background in regional geography, resource geography, geographic information science, and physical geography and in statistics and disciplines related to geography such as geology, forestry, and anthropology. Course offerings combined with excellent facilities and supportive electives allow students to develop particular interests such as resource management, environmental analysis, land use planning and cartography/geographic information systems/remote sensing.

The program has an applied orientation, placing emphasis on the application of geographic information science to environmental and resource utilization and problem solution. Master’s degree candidates may elect a thesis or nonthesis option. No foreign language is required for the MS degree. One foreign language is required for the PhD degrees.

Contact Program Director Julia Jones, 541-737-1224, jonesj@geo.oregonstate.edu, for additional information.

**Major Code: 5450**

**Geography Graduate Minor**

A Geography graduate minor consists of a minimum of 15 credits of Geography graduate coursework, including courses in physical geography and resource geography. A student interested in Geographic Information Science should pursue the Graduate Certificate in Geographic Information Science.

Contact Program Director Julia Jones, 541-737-1224, jonesj@geo.oregonstate.edu for additional information

**Minor Code: 5450**

**Geography Minor**

Also available via Ecampus.

The Geography minor will allow interested non-majors to explore:

- how the Earth works,
- the people who live on its surface,
- the value of accessing and properly using geographic information, and
- how to bring concepts of relative location, pattern, and spatial process to bear on key societal questions.

**Minor Code: 545**

The minor consists of 14 credits of core courses and at least 13 credits of elective courses for a total of 27 credits. Students must complete a minimum of 14 unique credits in the minor that do not fulfill requirements of majors, minors, options or certificates.

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<td>*EARTH SYSTEMS SCIENCE</td>
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<td>GEOG 203</td>
<td>*EVOLUTION OF PLANET EARTH</td>
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<td>GEOG 221</td>
<td>*ENVIRONMENTAL GEOLOGY (EC)</td>
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<td>*PHYSICAL GEOGRAPHY (EC)</td>
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<td>OC 103</td>
<td>*EXPLORING THE DEEP GEOGRAPHY OF THE WORLD’S OCEANS (EC)</td>
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<td>GEOG 201</td>
<td>*FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS (EC)</td>
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<td>G ISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY (EC)</td>
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<td>GEOG 370</td>
<td>GEOVISUALIZATION: CARTOGRAPHY (EC)</td>
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<tr>
<td>GEOG 371</td>
<td>GEOVISUALIZATION: WEB MAPPING</td>
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**Electives**

Select at least 13 credits of the following:

- **Physical Geography**
  - FE 430 | WATERSHED PROCESSES (EC) | 4 |
  - GED 306 | *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT (EC) | 4 |
  - GEOG 323 | *CLIMATOLOGY (EC) | 4 |
  - GEOG 324 | *ECOLOGICAL BIOGEOGRAPHY | 4 |
  - GEOG 423 | SNOW HYDROLOGY | 4 |

- **International Studies**
  - GEOG 311 | *GEOGRAPHY OF AFRICA | 4 |
  - GEOG 313 | *GEOGRAPHY OF ASIA | 4 |
  - GEOG 330 | **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION | 4 |
  - GEOG 431 | GLOBAL RESOURCES AND DEVELOPMENT | 4 |

- **Water Resources**
  - GEOG 340 | *INTRODUCTION TO WATER SCIENCE AND POLICY | 4 |
  - GEOG 423 | SNOW HYDROLOGY | 4 |
  - GEOG 440 | WATER RESOURCES MANAGEMENT IN THE UNITED STATES | 4 |
  - GEOG 441 | INTERNATIONAL WATER RESOURCES MANAGEMENT | 4 |

- **Resources, Hazards, and Planning**
  - GEOG 305 | *LIVING WITH ACTIVE CASCADE VOLCANOES (EC) | 4 |
  - GEOG 308 | *GLOBAL CHANGE AND EARTH SCIENCES (EC) | 4 |
  - GEOG 380 | *EARTHQUAKES IN THE PACIFIC NORTHWEST (EC) | 4 |
  - GEOG 331 | *POPULATION, CONSUMPTION, AND ENVIRONMENT | 4 |
  - GEOG 350 | *GEOGRAPHY OF NATURAL HAZARDS | 4 |
  - GEOG 432 | *GEOGRAPHY OF FOOD AND AGRICULTURE | 4 |
  - GEOG 450 | LAND USE IN THE AMERICAN WEST | 4 |
  - GEOG 451 | PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES | 4 |
The MA degree requires a foreign language proficiency equivalent to that attained at the end of a second-year university course in that language with a grade of C (2.00) or better.

Doctor of Philosophy (PhD) Degree
The doctor of philosophy (PhD) degree is granted for proven ability in research and mastery of an area within the discipline of geology. This is demonstrated through successful performance in at least 108 credits of appropriate course work and research. The pursuit of the PhD also requires passing qualifying exams that advance a student to candidacy. The doctoral program includes original research in a major topic in one of the department's areas of specialization submitted as a dissertation that is presented and defended orally. A committee of at least four members of the graduate faculty assist the major professor in supervising and examining the PhD student. PhD candidates must complete at least three of four consecutive terms with at least 36 credits taken on the OSU campus.

Graduate Minor
Advanced degree programs in geology may include an optional minor subject area. It may be in a single discipline or an integrated grouping of courses organized around a theme. In developing minors, students commonly combine courses from several campus departments.

Geology Graduate Minor (MA, MS, PhD)
Geology is the study of the materials, processes, and history of the solid Earth and its fluid envelopes. Geology is an integrative field, drawing on mathematics, chemistry, physics and biology to understand the interactions of the lithosphere, biosphere, atmosphere and hydrosphere. Studies in geology commonly combine observations and measurements from field, laboratory, and computational studies. Geology plays an important role in decisions about resource use, slope stability and the safety of building projects, natural hazards standards, mineral exploration and extraction, the basic workings of the Earth, and the understanding of the effects and rates of natural and human-induced change in the environment.

Most graduate research in the geology program includes field study. An approved field course of at least 9 quarter credits or equivalent experience is prerequisite to candidacy for a graduate degree. No foreign language is required.

Contact Program Director Ed Brook, 541-737-8197, brooke@geo.oregonstate.edu, for additional information.

Students who seek training in a combination of field and laboratory techniques applying a variety of scientific problems will find very few places with the number of opportunities or the variety of facilities that are available at Oregon State. Research in the department falls under three broad areas: Solid Earth Processes and History; Surface Earth Processes and History; and Human Interaction with the Earth.

Programs of study in the Geology graduate major lead to the Master of Science or Master of Arts and Doctor of Philosophy degrees.

Master of Science (MS) and Master of Arts (MA) Degrees
The master's degree requires successful completion of at least 45 credits of appropriate courses including a thesis. The thesis presents a written summary of research findings and conclusions. All master's programs include a final oral examination. Each graduate program is supervised by a committee of at least three members of the graduate faculty who collaborate with the student in developing a program of study and research leading to the final oral examination. The examination is conducted and approved by the student's graduate committee.

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<td>GEO 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
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<tr>
<td>or GEOG 102</td>
<td>*PHYSICAL GEOGRAPHY</td>
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<td>SURFACE PROCESSES</td>
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<td>GEO 370</td>
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<td>GEO 412</td>
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</table>
Marine Resource Management Graduate Certificate

Minor Code: 550

The management of our marine resources encompasses both biophysical and human dimensions. Marine management professionals need to understand these dimensions, utilizing both physical and social sciences to tackle challenging issues, and effectively communicate best management practices to scientists, decision makers, and stakeholders.

The Marine Resource Management graduate certificate offers a blend of science- and management-oriented courses that prepare participants (professionals, decision-makers, and graduate students) to become leaders in marine resource management.

- Current graduate students must notify the Marine Resource Management program of their intention to pursue this certificate. Upon consultation with MRM faculty, they will be given instructions regarding listing courses on their programs of study and obtaining the required signature for that form.
- Professionals and other students must notify the Marine Resources Management program of their intention to pursue this certificate.

The Marine Resource Management graduate certificate is not eligible for federal financial aid if it is not part of a master's degree-seeking program. The certificate is not eligible if taken as a stand-alone program. The MRM graduate certificate is eligible for federal financial aid if it is part of a master's degree-seeking program.

Contact Robert Allan, 541-737-1340, rallan@coas.oregonstate.edu, for more information.

Certificate Code: CG07

Certificate Overview
- Completion of core courses in marine policy and law,
- Two courses from the human dimensions area, and
- Two courses from the ocean and coastal science area.

Course Examples
- Ocean Law
- Rights-Based Fisheries Management
- Ecological Policy
- Physical Oceanography
- Marine Pollution

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<td>ENVIRONMENTAL AND RESOURCE ECONOMICS</td>
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<td>ANTH 581</td>
<td>NATURAL RESOURCES AND COMMUNITY VALUES</td>
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<td>COMM 540</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
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<td>COMM 542</td>
<td>BARGAINING AND NEGOTIATION PROCESSES</td>
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<td>MARINE CONSERVATION BIOLOGY</td>
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<td>ENVIRONMENTAL POLITICS AND POLICY</td>
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<td>OC 533</td>
<td>COASTAL AND ESTUARINE OCEANOGRAPHY</td>
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<tr>
<td>OEAS 540</td>
<td>THE BIOGEOCHEMICAL EARTH</td>
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Total Hours: 27

Other courses may be substituted upon approval of the certificate director.

Certificate Code: CG07

Marine Resource Management Graduate Major (MA, MS)

Graduate Areas of Concentration

Marine resource management

Marine Resource Management (MRM) is a science-based, interdisciplinary master’s program based in College of Earth, Ocean, and Atmospheric Sciences (CEOAS). The program provides students with the interdisciplinary training necessary to function confidently and effectively in professional resource management positions. Marine and coastal issues are technically and politically complex, involving many interests, perspectives, and stakeholders. To deal effectively with these issues, marine resource managers need a broad-based background in both physical and social sciences. Graduates from the program are trained to bridge the gap between science and policy.

The program offers two tracks, professional and a thesis:

**Professional track** students develop a project and defend a report on that work, based on either an internship or a research project.

**Thesis track** students are expected to produce a more extensive and rigorous piece of original work and analysis, and must meet additional requirements set by the Graduate School and advisor. Applicants must meet the general admission requirements of the college.
More than 40 faculty members from CEDAS, other university departments, and outside institutions participate in MRM. These partnerships include departments of Fisheries and Wildlife, Applied Economics, and Anthropology; the School of Public Policy; Sea Grant Extension specialists; and scientists and management professionals from state and federal agencies. The program consists of required courses in oceanography, atmospheric science, and marine law. Typical elective courses include resource economics, fisheries science, political science, anthropology, sociology, and communications. Each program of study is adjusted to the needs of the individual. Applicants must meet the general admission requirements of the college.

Contact Flaxen Conway, 541-737-1340, fconway@coas.oregonstate.edu, for more information.

**Major Code:** 6550

**Minor Code:** 6550

### Marine Resource Management Graduate Minor

Contact Robert Allan, 541-737-1340, rallan@coas.oregonstate.edu for more information.

**Minor Code:** 6550

### Ocean, Earth and Atmospheric Sciences Graduate Major (MA, MS, PhD)

#### Graduate Areas of Concentration

*Atmospheric sciences, geological oceanography, geophysics, ocean ecology and biogeochemistry, physical oceanography*

**Major Code:** 5001

Ocean, Earth and Atmospheric Sciences (OEAS) is an interdisciplinary graduate major that first introduces students to the elements of the Earth system and the processes of mass and energy flow among them through a set of core/breadth courses:

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<td>THE FLUID EARTH</td>
<td>4</td>
</tr>
<tr>
<td>OEAS 540</td>
<td>THE BIOGEOCHEMICAL EARTH</td>
<td>4</td>
</tr>
</tbody>
</table>

Students then pursue focused graduate course work and research in the following concentration areas, directed by their program committee.

### OEAS Concentration Areas

#### Atmospheric Sciences

The atmospheric sciences are concerned with dynamics, physics and processes, including the interactions of the atmosphere with soil physics, hydrology and oceanic circulation. The atmospheric sciences concentration in the College of Earth, Ocean, and Atmospheric Sciences prepares students for careers in teaching and research through advanced study and participation in research projects directed by faculty members. MA, MS and PhD degrees are offered.

Applicants should have an undergraduate degree in physics, mathematics, engineering, chemistry or atmospheric science, with strength in mathematics. All applicants should have completed one year each of chemistry and physics with calculus, and courses in vector calculus and in differential equations.

Students perform thesis research on a wide range of problems including the study of global climate change, clouds and the earth's radiation budget, the structure and dynamics of turbulent flows, air-sea interaction, planetary atmospheres, the optimal use and economic value of weather and climate forecasts, and the study of acid rain and its effects on terrestrial ecosystems. In addition to theoretical, numerical, and observational methods of analysis, approximately one-fourth of the research projects either use or are developing methods for obtaining meteorological information from satellites.

Opportunities exist for PhD candidates to conduct some of their thesis research in Europe or at the National Center for Atmospheric Research. Most research projects involve collaboration with other scientists, either on the Oregon State University campus or at major domestic or international research centers.

#### Geophysics

Geophysics is concerned with physical processes within and on Earth, especially the internal physical constitution of the planet, and seismic, gravitational, geothermal, geoelectrical, geomagnetic phenomena and their relation to geological processes. The geophysics concentration offers graduate work toward MA, MS, and PhD degrees. Candidates should have an undergraduate degree in physics, mathematics, engineering, geology, or geophysics. Mathematics through differential equations is required and mathematical physics is desirable. Graduate Record Exam scores are required of all applicants. Opportunities for research exist on a wide range of geophysical problems in marine and continental regimes, emphasizing experimental, applied, and theoretical aspects.

#### Oceanography

Oceanography, the application of the sciences to the study of the oceans, is an interdisciplinary environmental science concerned with all processes: biological, chemical, geological, and physical, as well as the interactions between the ocean. The College of Earth, Ocean, and Atmospheric Sciences graduate major offers MA, MS, and PhD degrees with a concentration in oceanography.

For all areas in oceanography, applicants should have a strong quantitative background and an undergraduate degree in a relevant field of science or engineering and one year each of chemistry, physics, and calculus. Prior background in oceanography is not essential.

In geological oceanography (marine geology), a broad range of geological processes that influence the ocean is studied. Fields of interest include plate tectonics and the structure of the ocean basins, igneous petrology and geochemistry, paleoceanography and paleoclimatology, and coastal sedimentary processes. Candidates show strength in one or more of these fields: earth science, chemistry, physics, biology or mathematics.

Physical oceanography research covers the physical processes in the sea, exchange of energy and momentum at the air-sea interface, and the transmission and absorption of energy in the sea (e.g., light, heat, and sound). Circulation, tides, waves, heat content and density distributions
are some of the other phenomena of particular interest. Candidates should have an undergraduate major in physics, mathematics, or engineering.

Contact Robert Allan, 541-737-1340, rallan@coas.oregonstate.edu, for more information.

**Major Code:** 5001

**Oceanography Minor**

**Minor Code:** 660

Must complete a minimum of 14 unique credits in the minor that do not fulfill requirements of majors, minors, options or certificates.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required Core</strong></td>
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</tr>
<tr>
<td>OC 201</td>
<td>*OCEANOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>OC 332</td>
<td>COASTAL OCEANOGRAPHY</td>
<td>3</td>
</tr>
<tr>
<td>OC 333</td>
<td>OCEANS, COASTS, AND PEOPLE</td>
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<tr>
<td></td>
<td>Select two courses from the following: 6-8</td>
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<tr>
<td>OC 420</td>
<td>PRINCIPLES OF PHYSICAL OCEANOGRAPHY</td>
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<tr>
<td>OC 440</td>
<td>BIOLOGICAL OCEANOGRAPHY</td>
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<tr>
<td>OC 450</td>
<td>CHEMICAL OCEANOGRAPHY</td>
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<tr>
<td>OC 460</td>
<td>GEOLOGICAL OCEANOGRAPHY</td>
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<tr>
<td></td>
<td><strong>Electives</strong></td>
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<tr>
<td>Select 10-11 credits from the following: 1</td>
<td>10-11</td>
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</tr>
<tr>
<td>OC 434</td>
<td>ESTUARINE ECOLOGY</td>
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</tr>
<tr>
<td>OC 433</td>
<td>COASTAL AND ESTUARINE OCEANOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>or FW 434</td>
<td>ESTUARINE ECOLOGY</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Biological Science</strong></td>
<td></td>
</tr>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>BI 421</td>
<td>AQUATIC BIOLOGICAL INVASIONS</td>
<td></td>
</tr>
<tr>
<td>FW 426</td>
<td>COASTAL ECOLOGY AND RESOURCE MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FW 497</td>
<td>*AQUACULTURE (taught at Hatfield Marine Science Center)</td>
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<tr>
<td>Z 461</td>
<td>MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY</td>
<td></td>
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</tbody>
</table>

Total Hours: 26-29

1 Select from the listed courses (or the two other 400-level courses above) to bring the credit total to 27. Courses are grouped by focus area, but students may choose courses from one or more areas

**Risk and Uncertainty Quantification in Earth Systems Graduate Minor**

Marine and coastal scientific and management issues are technically and socially complex, involving many forms of science, interests, perspectives, and stakeholders. There is much uncertainty in modeling forecast and policy outcomes associated with climate change and global markets. This interdisciplinary graduate minor will provide students with knowledge and skills to quantify and communicate risk and uncertainty derived from the analyses of large data in earth system science.

The graduate minor focuses on marine science and resource management, yet will be relevant to students from a variety of fields. Students will extend their ability to perceive and solve problems in a transdisciplinary context related to statistical inference, uncertainty quantification, risk analyses, earth system science, and social systems. Students will also acquire professional skills in communication and collaboration. The world is changing. Join us in becoming more resilient. The graduate minor is open to all OSU graduate students.

**Learning Goals**

**Social Systems**

The “social or human system” component is one of the key elements of a coupled natural human system. Specifically, it encompasses the social, cultural, economic, management, and policy aspects of the system, and how they interact with each other and with their environment. Disciplinary approaches to the human system include anthropology, sociology, policy, economics, etc. The goal of the “social systems” training component of the graduate R&U minor is to learn about social science methods, theory and/or applications as they relate to a marine, coupled natural human system. Risk and Uncertainty graduate minor students are expected to complete the requirements by taking at least one course in this area.

The course must allow students to: (1) Recognize the perspective of the particular discipline or area of study, (2) Understand and respect the various methodological approaches used in the social sciences (qualitative and/or quantitative), their possibilities and limitations, and how these may be best integrated to the earth systems, big data or R&U component of the minor, (3) Explain and extract the scalar nature of the course material, whether it is related to cultural, social, institutional, management, or policy aspects of a system, (4) Critically assess gaps or opportunities for inclusion of social, cultural, or economic elements of a natural system, and vice versa.

**Risk and Uncertainty**

The goal of the risk and uncertainty quantification training component of the graduate R&U minor is to understand and acquire mastery of some of the fundamental mathematical/computational and statistical methods for quantifying uncertainty and analyzing risk for decision making. NRT (National Research Traineeship) students seeking the graduate minor are expected to acquire (mathematical/computational/statistical) tools that can be used to describe and assess risk and uncertainty in problems related to the marine, coupled natural human system. Students have options to choose from a variety of courses dealing with the mathematical foundations of risk and uncertainty involving

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)
mathematical techniques in (i) decision making under uncertainty, (ii) ruin probabilities, (iii) measures of variability, (iv) probabilities of rare events and large deviations, (v) Monte Carlo simulation, (vi) optimization and dynamic programming, (vii) stochastic models in biology pertaining to spread of disease and related phenomena. Students are expected to acquire experience in a combination of computational, simulation and/or theoretical approaches. NRT students with a social science or human dimension component will be expected to understand and become literate and conversant in the quantitative aspects of risk and uncertainty quantification.

Earth Systems
Students will develop an integrated understanding of the Earth System, including biological, physical and geological mechanisms that affect Earth climate, species dynamics and interactions, elemental cycles and ecosystem services. The emphasis will be on understanding the linkages between physics, biology, geology, and chemistry from a system theory perspective, and on how these linkages affect Earth’s biogeochemical processes. Disciplinary components of the Earth System module include biological, chemical and physical oceanography, biogeochemistry, geology, climate and atmospheric sciences, and ecology.

Big Data
Issues surrounding massive data sets ('big' data) are intertwined with data-enabled science and engineering. The goals of the big data training component are for students

1. to acquire computational and data-management skills necessary for handling and processing large data sets, and
2. to assess the value of information obtained from big data with respect to such issues as observation bias, signal versus noise, spurious relationships, and incidental endogeneity.

Much of the training in big data management and processes is acquired through hands-on experiences. Specific components of the big data module include handling and processing massive datasets; being able to identify and articulate the limitations of big data sets; implementing classification, clustering and/or network analyses as appropriate.

Minor Code: 5050
Graduate PhD students are required to complete at least 18 credits, MS students complete 15 credits.

All students complete the professional development requirement (6 credits).

Additional credits are taken from these four following specializations:

1. Big Data and Uncertainty Quantification
2. Risk Analyses
3. Earth Systems
4. Social Systems

Mentoring Requirements
There must be a minor professor in the student’s committee. The minor professor is in any of the fields where course designators fall but must not be from the student’s major.

Classes for Minor
Graduate PhD students are required to complete at least 18 credits, MS students are required to complete at least 15 credits for the minor.

PhD students take one course from each of the four remaining areas: Big data and Uncertainty Quantification, Risk Analyses, Earth Systems, and Social Systems.

MS students take one course in Social Systems and one in Earth Systems and choose one course from either Big Data and Uncertainty Quantification or Risk Analysis.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRM 525</td>
<td>SPECIAL TOPICS IN MARINE RESOURCE MANAGEMENT</td>
<td>6</td>
</tr>
<tr>
<td>CS 515</td>
<td>ALGORITHMS AND DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CS 534</td>
<td>MACHINE LEARNING</td>
<td>4</td>
</tr>
<tr>
<td>GEG 565</td>
<td>SPATIO-TEMPORAL VARIATION IN ECOLOGY AND EARTH SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>ST 538</td>
<td>MODERN STATISTICAL METHODS FOR LARGE AND COMPLEX DATA SETS</td>
<td>3</td>
</tr>
<tr>
<td>ST 599</td>
<td>SPECIAL TOPICS (Big Data and Uncertainty Quantification)</td>
<td>1-4</td>
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</tbody>
</table>

Risk Analysis Specialization

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FW 544</td>
<td>QUANTITATIVE DECISION ANALYSIS FOR FISH AND WILDLIFE MANAGEMENT</td>
<td>4</td>
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<tr>
<td>ME 515</td>
<td>RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN</td>
<td>4</td>
</tr>
<tr>
<td>MTH 527</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 563</td>
<td>PROBABILITY I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 567</td>
<td>ACTUARIAL MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>MTH 599</td>
<td>SPECIAL TOPICS (Risk Analysis)</td>
<td>3</td>
</tr>
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</table>

Earth Systems Specialization

Select at least one of the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ATS 520</td>
<td>PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE</td>
</tr>
<tr>
<td>GED 550</td>
<td>COASTAL HAZARDS: PROCESSES, RESPONSE, AND ADAPTATION</td>
</tr>
<tr>
<td>GED 684 or SOIL 684</td>
<td>GLOBAL BIOGEOCHEMICAL CYCLES</td>
</tr>
<tr>
<td>OC 523</td>
<td>OCEAN ECOLOGICAL DYNAMICS</td>
</tr>
<tr>
<td>OC 533</td>
<td>COASTAL AND ESTUARINE OCEANOGRAPHY</td>
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<tr>
<td>OC 534</td>
<td>ESTUARINE ECOLOGY</td>
</tr>
<tr>
<td>OC 599</td>
<td>SPECIAL TOPICS IN OCEANOGRAPHY</td>
</tr>
<tr>
<td>OEAS 520</td>
<td>THE SOLID EARTH</td>
</tr>
<tr>
<td>OEAS 530</td>
<td>THE FLUID EARTH</td>
</tr>
<tr>
<td>OEAS 540</td>
<td>THE BIOGEOCHEMICAL EARTH</td>
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</tbody>
</table>

Social Systems Specialization

Select at least one of the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>AEC 552 or MRM 552</td>
<td>MARINE ECONOMICS</td>
</tr>
<tr>
<td>ANTH 581</td>
<td>NATURAL RESOURCES AND COMMUNITY VALUES</td>
</tr>
<tr>
<td>COMM 599</td>
<td>SPECIAL TOPICS (Policy Conflict and Public Participation, 3)</td>
</tr>
<tr>
<td>MRM 530</td>
<td>PRINCIPLES AND PRACTICE OF MARINE RESOURCE MANAGEMENT</td>
</tr>
<tr>
<td>PPOL 545</td>
<td>INTERNATIONAL MARINE POLICY</td>
</tr>
<tr>
<td>PPOL 546</td>
<td>THE POLICY AND LAW OF UNITED STATES COASTAL GOVERNANCE</td>
</tr>
<tr>
<td>PPOL 548</td>
<td>MARINE POLICY IN THE UNITED STATES</td>
</tr>
</tbody>
</table>
Water Conflict Management and Transformation Graduate Certificate

Also available via Ecampus.

Non-degree students, and those requiring additional information and advising, should contact the program director.

Lynette de Silva, Director
Program in Water Conflict Management and Transformation
Oregon State University
College of Earth, Ocean, and Atmospheric Sciences
256 Wilkinson Hall
Corvallis, OR 97331
Phone: 541-737-7013
Fax: 541-737-1200
Email: desilval@geo.oregonstate.edu
Website: http://transboundarywaters.science.oregonstate.edu/

The graduate certificate in Water Conflict Management and Transformation is an 18-credit interdisciplinary program. It is designed to provide graduate students, non-degree students, water professionals and decision-makers with the required specialized resources and skills to address the water demands and challenges of the 21st Century, in Oregon, across the United States and internationally.

The curriculum centers around case-based, interactive course and field work to provide an in-depth look at water conflict, conflict transformation, and prevention issues and strategies across four distinct and overlapping themes:

- Water Governance
- Water and Ecosystems
- Water and Society
- Water and Economics

Each theme incorporates several topics critical to understanding water conflicts.

Certificate Code: CG06

Advisor guidance and approval is required for each student’s certificate program of study. All students seeking a graduate certificate are subject to all general policies governing the courses for the master’s degree. As such, these students will be required to take a minimum of 50% graduate stand-alone courses. The remaining credits may be the 500 component of 400/500 slash courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Capstone Coursework</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 3 credits from the following:

- COMM 542 BARGAINING AND NEGOTIATION PROCESSES
- COMM 546 COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES
- WRP 521 WATER CONFLICT MANAGEMENT AND TRANSFORMATION

Capstone Practicum/Internship

Select one course from the following: 3

- WRP 509 PRACTICUM
- WRP 510 INTERNSHIP

Water Governance

Select one course from the following: 3

- AEC 532 ENVIRONMENTAL LAW
- COMM 540 THEORIES OF CONFLICT AND CONFLICT MANAGEMENT
- FOR 562 NATURAL RESOURCE POLICY AND LAW
- FOR 563 ENVIRONMENTAL POLICY AND LAW INTERACTIONS
- GEOG 540 WATER RESOURCES MANAGEMENT IN THE UNITED STATES
- GEOG 541 THE WORLD’S WATER
- PS 575 ENVIRONMENTAL POLITICS AND POLICY
- PS 577 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
- WRP 599 SPECIAL TOPICS (Oregon Water Law and Policy)

Water and Society

Select one course from the following: 3-4

- ANTH 581 NATURAL RESOURCES AND COMMUNITY VALUES
- ENVE 531 FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS
- ENVE 532 AQUATIC CHEMISTRY NATURAL AND ENGINEERED SYSTEMS
- ENVE 554 GROUNDWATER REMEDIATION
- ENVE 556 SUSTAINABLE WATER RESOURCES DEVELOPMENT
- FES 585 CONSENSUS AND NATURAL RESOURCES
- GEOG 530 RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT
- H 512 INTRODUCTION TO ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES
- H 514 ENVIRONMENT, SAFETY AND HEALTH SEMINAR
- H 527 CRITICAL ASSESSMENT OF INTERNATIONAL HEALTH PROGRAMS
- H 528 GLOBAL HEALTH ISSUES
- H 529 INTERNATIONAL HEALTH
- H 540 WATER AND HUMAN HEALTH
- H 541 AIR QUALITY AND HUMAN HEALTH
- PHL 540 ENVIRONMENTAL ETHICS
- PHL 543/REL 543 WORLD VIEWS AND ENVIRONMENTAL VALUES
- PS 577 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
- SNR 520 SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES
- SOC 580 ENVIRONMENTAL SOCIOLOGY
- SOC 581 SOCIETY AND NATURAL RESOURCES
- WRP 524 SOCIOTECHNOLOGICAL ASPECTS OF WATER RESOURCES

Water and Ecosystems

Select one course from the following: 3-4

- BEE 512 PHYSICAL HYDROLOGY
- BEE 558 NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL
- FE 530 WATERSHED PROCESSES
- FE 532 FOREST HYDROLOGY
- FW 526 COASTAL ECOSYSTEMS AND LANDSCAPE MANAGEMENT
- FW 579 WETLANDS AND RIPARIAN ECOLOGY
- GEOG 523 SNOW HYDROLOGY
- MNR 511 INTRODUCTION TO SUSTAINABLE NATURAL RESOURCES
Major Code: CG06

Water Conflict Management and Transformation Graduate Minor
Graduate Areas of Concentration

Water conflict management and transformation

The graduate minor in Water Conflict Management and Transformation is designed to accommodate the needs of professionals and graduate students. It offers an integrative approach that explicitly integrates human and policy dimensions of water resources within the framework of scientific and technological solutions. The graduate minor is a flexible, coherent program that offers critical and underemphasized skills essential to preventing and resolving water conflicts. It helps facilitate dialogue on critical water issues across diverse values and perspectives, and it serves OSU students, citizens and officials in Oregon, the United States and internationally.

The curriculum centers around case-based, interactive course and field work to provide an in-depth look at water conflict, conflict transformation, and prevention issues and strategies across four distinct and overlapping themes: water governance, water and ecosystems, water and society, and water and economics. Each theme incorporates several topics critical to understanding water conflicts. A highlight of the minor is the capstone course coupled with an intersession practicum working with watershed councils, landowners, and agencies in Northeast Oregon; and a guided and critiqued project in which two teams take on, for example, the roles of Jordan and Israel to negotiate a treaty for water resource allocation in a simulated water negotiation. These techniques will hone student skills, understanding and thought development. Students will also take part in fieldwork in a watershed or basin at risk of, or in, water conflict.

Through this minor, students will learn about and practice conflict transformation skills, explore what new institutional networks and relationships are needed, and how these can be achieved through role-playing, in-class exercises, and guest lectures. Students will also be introduced to leadership skills for guiding this type of change.

Contact Lynette de Silva, 541-737-7013, desilval@geo.oregonstate.edu, for additional information.

Minor Code: 1006

All students seeking a graduate minor are subject to all general policies governing the courses for the master’s degree. As such, these students will be required to take a minimum of 50 percent graduate stand-alone courses. The remaining credits may be the 500-component of 400/500 slash courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>WRP 599</td>
<td>PRACTICUM</td>
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<tr>
<td>WRP 510</td>
<td>INTERNSHIP</td>
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Water Governance

Select one course from the following: 3

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<th>Title</th>
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<tr>
<td>AEC 511</td>
<td>ENVIRONMENTAL LAW</td>
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<tr>
<td>COMM 540</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FOR 562</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
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</tr>
<tr>
<td>FOR 563</td>
<td>ENVIRONMENTAL POLICY AND LAWS INTERACTIONS</td>
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<tr>
<td>GEOG 540</td>
<td>WATER RESOURCES MANAGEMENT IN THE UNITED STATES</td>
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<tr>
<td>GEOG 541</td>
<td>THE WORLD’S WATER</td>
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<tr>
<td>PS 575</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
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<tr>
<td>PS 577</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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<tr>
<td>WRP 599</td>
<td>SPECIAL TOPICS (Oregon Water Law and Policy)</td>
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Water and Society

Select one course from the following: 2-4

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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ANTH 581</td>
<td>NATURAL RESOURCES AND COMMUNITY VALUES</td>
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</tr>
<tr>
<td>ENVE 531</td>
<td>FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS</td>
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<tr>
<td>ENVE 532</td>
<td>AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS</td>
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<tr>
<td>ENVE 554</td>
<td>GROUNDWATER REMEDIATION</td>
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<tr>
<td>ENVE 556</td>
<td>SUSTAINABLE WATER RESOURCES DEVELOPMENT</td>
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<tr>
<td>FES 585</td>
<td>CONSENSUS AND NATURAL RESOURCES</td>
<td></td>
</tr>
<tr>
<td>GEOG 530</td>
<td>RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>H 512</td>
<td>INTRODUCTION TO ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES</td>
<td></td>
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<tr>
<td>H 514</td>
<td>ENVIRONMENT, SAFETY AND HEALTH SEMINAR</td>
<td></td>
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<tr>
<td>H 527</td>
<td>CRITICAL ASSESSMENT OF INTERNATIONAL HEALTH PROGRAMS</td>
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<td>H 528</td>
<td>GLOBAL HEALTH ISSUES</td>
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<td>H 529</td>
<td>INTERNATIONAL HEALTH</td>
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<tr>
<td>H 540</td>
<td>WATER AND HUMAN HEALTH</td>
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<tr>
<td>H 541</td>
<td>AIR QUALITY AND HUMAN HEALTH</td>
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<td>PHL 540</td>
<td>ENVIRONMENTAL ETHICS</td>
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<tr>
<td>PHL 543</td>
<td>WORLD VIEWS AND ENVIRONMENTAL VALUES</td>
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<tr>
<td>or REL 543</td>
<td>WORLD VIEWS AND ENVIRONMENTAL VALUES</td>
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<tr>
<td>PS 577</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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<td>SNR 520</td>
<td>SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES</td>
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College of Education

The College of Education develops multiculturally competent researchers, scholars, learning leaders and practitioners who make a difference by promoting innovation, social justice, and lifelong learning with a focus on STEM and cultural and linguistic diversity. Our research and professional preparation foster scholarship, intellectual stimulation, openness, flexibility, and a sense of community.

Minor Code: 1006

College of Education

The College of Education offers undergraduate and graduate degrees to prepare teachers, counselor educators, educational researchers, and other educational professionals for careers in K-12 schools, community colleges/universities, business and industry, and other postsecondary settings. In addition, there are electives for undergraduate students who wish to explore education as a career choice. All programs reflect research-based approaches to education and counseling developed by university faculty.

Authorization and Accreditation

The College of Education is authorized by the State Board of Higher Education to offer teacher education and counseling programs and by the Oregon Teacher Standards and Practices Commission (TSPC) to recommend teacher and counselor candidates for initial licensure. Refer to the listing of endorsements (http://www.tspc.state.or.us/program_list.asp) that OSU is authorized to approve.

All teacher education programs are fully accredited by the Council for the Accreditation of Educator Preparation (CAEP) and by the Oregon Teacher Standards and Practices Commission. Counselor education programs are fully accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).

Applicants for teacher and counselor licensure must meet TSPC requirements in effect at the time of admission to a licensure program. Licensure rules are regulated by TSPC and may change. Students should consult regularly with their advisor.

Advising

Early and continuous advising is an important aspect of an education in both the undergraduate and graduate programs in the College of Education.

Scholarships

The College of Education offers a variety of scholarships and fellowships to deserving students. A listing of the many opportunities can be found on the College of Education website (http://education.oregonstate.edu/education-scholarships-and-fellowships/). Additional state and private scholarship information are available at the OSU Office of Financial Aid and Scholarships.

Faculty

Professors Alexander, Buxton, Crisp, Dierking, Dykeman, Ng, Storksdeick
**Associate Professors** Bouwma-Gearhart, Ciechanowski, Colomer, Elliott, Kibler, Rowe, Rubel, Thompson

**Assistant Professors** Arellano, Giamellaro, Nguyen, Reese, Tevis

**Clinical Assistant Professors** Biles, Cazares-Cervantes, DeMeyer, Ford, LaGue, Muzacz, Schulz


**Emeritus Faculty**

Falk, Flick, Moule, Niess, Russ-Eft, Stern, Winograd

**Program Leads**

Ford, McKiel, Palaniuk, Pitcher, Platt, Roach, Schulz, Wright

**Undergraduate Programs**

**Majors**

- Education (p. 370)
  - **Options:**
    - Advanced Mathematics Teaching (p. 371)
    - Biology Teaching (p. 372)
    - Chemistry Teaching (p. 372)
    - Elementary Teaching (p. 373)
    - Family and Consumer Sciences Teaching (p. 374)
    - Foundational Mathematics Teaching (p. 375)
    - Health Teaching (p. 375)
    - Integrated Science Teaching (p. 376)
    - Language Arts Teaching (p. 377)
    - Physics Teaching (p. 377)
    - Social Studies Teaching (p. 378)
    - Elementary Education (p. 379)

**Minors**

- Education (p. 370)

**Graduate Programs**

**Majors**

- Adult and Higher Education (p. 361)
  - **Options:**
    - Community College Leadership (p. 362)
    - Leadership in Higher Education (p. 363)
  - Counseling (p. 363)
  - **Options:**
    - Clinical Mental Health Counseling (p. 364)
    - Counselor Education
    - School Counseling (p. 365)
  - Education (p. 366)
  - **Options:**
    - Advanced Science and Mathematics Education (p. 368)
    - Agricultural Education (p. 368)
    - Free-Choice Learning (p. 368)
    - Language Equity and Educational Policy (p. 368)
    - Mathematics Education (p. 369)
    - PK-12 English to Speakers of Other Language (ESOL) (p. 369)
    - Science Education (p. 369)
    - Science/Mathematics Education (p. 369)
    - Social Justice Education (p. 370)
    - Teaching (p. 381)
  - **Options:**
    - Clinically Based Elementary (p. 382)
    - Elementary (p. 382)
    - Language Arts (p. 383)
    - Mathematics (p. 383)
    - Music (p. 383)
    - Science (p. 384)
    - Social Studies (p. 384)

**Minors**

- Adult Education (p. 363)
- Counseling (p. 366)
- Education (p. 370)
- Mathematics Education (p. 381)
- Science Education (p. 381)

**Certificate**

- Dual Language Education (p. 366)
- English for Speakers of Other Languages (p. 381)
- Instructional Design (p. 381)

**Adult Education and Higher Education Leadership**

**AHE 199. SPECIAL TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**AHE 299. SPECIAL TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**AHE 399. SPECIAL TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**AHE 401. RESEARCH. (1-16 Credits)**

*Equivalent to: ED 401*  
*This course is repeatable for 16 credits.*

**AHE 402. INDEPENDENT STUDY. (1-16 Credits)**

*Equivalent to: ED 402*  
*This course is repeatable for 16 credits.*

**AHE 405. READING AND CONFERENCE. (1-16 Credits)**

*Equivalent to: CSSA 405*  
*This course is repeatable for 16 credits.*

**AHE 406. PROJECTS. (1-16 Credits)**

*Equivalent to: CSSA 406*  
*This course is repeatable for 16 credits.*

**AHE 407. SEMINAR. (1-16 Credits)**

*Equivalent to: CSSA 407, UEXP 407*  
*This course is repeatable for 16 credits.*

**AHE 408. WORKSHOP. (1-16 Credits)**

*Equivalent to: CSSA 408*  
*This course is repeatable for 16 credits.*

**AHE 410. INTERNSHIP/WORK EXPERIENCE. (1-16 Credits)**

*Equivalent to: ED 410*  
*This course is repeatable for 16 credits.*
AHE 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ED 499
This course is repeatable for 16 credits.

AHE 501. RESEARCH. (1-16 Credits)
Equivalent to: CSSA 501, ED 501
This course is repeatable for 16 credits.

AHE 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: CSSA 502
This course is repeatable for 16 credits.

AHE 503. THESIS. (1-16 Credits)
Equivalent to: CSSA 503
This course is repeatable for 999 credits.

AHE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSSA 505
This course is repeatable for 16 credits.

AHE 506. PROJECTS. (1-16 Credits)
Equivalent to: CSSA 506
This course is repeatable for 16 credits.

AHE 507. SEMINAR. (1-5 Credits)
Equivalent to: CSSA 507
This course is repeatable for 16 credits.

AHE 508. WORKSHOP. (1-3 Credits)
Equivalent to: CSSA 508
This course is repeatable for 16 credits.

AHE 509. PRACTICUM. (1-16 Credits)
Equivalent to: ED 509
This course is repeatable for 16 credits.

AHE 510. INTERNSHIP. (1-18 Credits)
By special permission and arrangement.
Equivalent to: ED 510
This course is repeatable for 18 credits.

AHE 517. EDUCATION AND WORK. (3 Credits)
Issues related to work in the U.S. and other countries. The role of public, private, corporate, government, military and other education and training programs in meeting changing individual, corporate, and social work-related needs.
Equivalent to: ED 517

AHE 520. MULTICULTURAL ISSUES IN HIGHER EDUCATION. (3 Credits)
Developing understanding, knowledge, and skills of multiculturalism affecting the student affairs profession and careers in student affairs administration.
Equivalent to: CSSA 520

AHE 522. INSTRUCTIONAL TECHNOLOGY I. (1 Credit)
Explores technologies used in distance education to deliver content and facilitate active learning through learner creation of digital portfolios and artifacts using online tools and apps.

AHE 523. INSTRUCTIONAL TECHNOLOGY II. (1 Credit)
An overview of best practices in digital-age learning design, including implementation of backward design principles.
Prerequisites: AHE 522 with C or better

AHE 524. INSTRUCTIONAL TECHNOLOGY III. (1 Credit)
Students will develop the knowledge and skills needed to design and create complete online teachings/courses within a learning management system.
Prerequisites: (AHE 522 with C or better and AHE 523 [C])

AHE 525. INSTRUCTIONAL TECHNOLOGY IV. (1 Credit)
Learners will research and demonstrate how to use a current innovative instructional technology, as well as develop skills in understanding trends and preparing for future innovations in instructional technology.
Prerequisites: (AHE 522 with C or better and AHE 523 [C] and AHE 524 [C])

AHE 531. INSTRUCTIONAL DESIGN. (4 Credits)
Designed for instructors, trainers, managers, organizational consultants or others who are responsible for the development of programs and courses in community colleges, the workplace or other settings. Using systems concepts and methods, students will learn to design learner-centered instructional programs and courses.
Equivalent to: ED 531

AHE 532. PROGRAM EVALUATION. (4 Credits)
Assessing outcomes in college curriculum and workplace training programs from a systems perspective and evaluation of program effectiveness. Particular emphasis on formative and summative evaluation, frameworks for program evaluation, quantitative and qualitative methods and analysis, communicating and reporting evaluation findings, and the ethics and standards of evaluation practice.
Equivalent to: ED 532

AHE 533. NEEDS ASSESSMENT AND RESEARCH. (4 Credits)
Introduces workplace learning needs assessment (WLNA) and research principles and practices for individual and collaborative learning groups.
Prerequisites: AHE 553 with C or better
Equivalent to: ED 533

AHE 534. ORGANIZATIONS AND SYSTEMS THEORY. (4 Credits)
Introduces principles and practices underlying individual and collaborative work group learning. Participants will learn how to create an environment that promotes effective and efficient workplace learning.

AHE 547. INSTRUCTIONAL STRATEGIES FOR ADULT LEARNERS. (4 Credits)
Exploration of and practice using instructional strategies to enhance adult learning. Acquisition of an instructional strategy tool kit as well as a method for evaluating adult learning events.
Equivalent to: ED 547
This course is repeatable for 60 credits.

AHE 549. ETHICAL AND PROFESSIONAL ISSUES. (4 Credits)
Focuses on issues facing professionals working with adult learners as well as ethical issues relevant to the practice and scholarship in the field. Combines instruction in inquiry-based teaching methods and learning theory with work in professional settings, such as for-profit and non-profit organizations and government agencies.

AHE 553. ADULT LEARNING & DEVELOPMENT. (4 Credits)
Introduces workplace learning needs assessment (WLNA) and research principles and practices for individual and collaborative learning groups.
Prerequisites: AHE 553 with C or better
Equivalent to: ED 553

AHE 557. INSTRUCTIONAL STRATEGIES FOR ADULT LEARNERS. (4 Credits)
Introduces workplace learning needs assessment (WLNA) and research principles and practices for individual and collaborative learning groups.
Prerequisites: AHE 553 with C or better
Equivalent to: ED 553

AHE 567. LEADERSHIP DEVELOPMENT AND HUMAN RELATIONS. (4 Credits)
Exploration of multiple theories of leadership in different organizational contexts; synthesize theory with experience to construct a personal framework for leadership practice.
Equivalent to: ED 567
AHE 575. EDUCATIONAL FINANCE. (3 Credits)
Finance, budgeting and accounting for sources of revenue; deferral, state and local financing, budgeting and accounting models, practical experience combined with examination of theory, trends and issues. Focus in either public schools, community colleges or higher education through practical experience.
Equivalent to: ED 575

AHE 582. LEGAL ISSUES IN HIGHER EDUCATION. (3 Credits)
A comprehensive presentation and discussion of the law governing administration within community colleges and college/universities with a special emphasis on student services administration.

AHE 599. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: CSSA 599, ED 599
This course is repeatable for 16 credits.

AHE 601. RESEARCH. (1-16 Credits)
Equivalent to: ED 601
This course is repeatable for 16 credits.

AHE 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: ED 602
This course is repeatable for 16 credits.

AHE 603. THESIS. (1-16 Credits)
Equivalent to: ED 603
This course is repeatable for 999 credits.

AHE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: ED 605
This course is repeatable for 16 credits.

AHE 606. PROJECTS. (1-16 Credits)
Equivalent to: CSSA 606
This course is repeatable for 16 credits.

AHE 607. SEMINAR. (1-16 Credits)
Equivalent to: ED 607
This course is repeatable for 16 credits.

AHE 608. WORKSHOP. (1-16 Credits)
Equivalent to: ED 608
This course is repeatable for 16 credits.

AHE 609. PRACTICUM CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: ED 609
This course is repeatable for 16 credits.

AHE 610. INTERNSHIP. (1-15 Credits)
Equivalent to: ED 610
This course is repeatable for 15 credits.

AHE 611. QUANTITATIVE ANALYSIS IN EDUCATIONAL RESEARCH I. (3 Credits)
A comprehensive course to methods and statistics used in quantitative educational research. Examines data analysis, statistical procedures, and interpretation of results within postsecondary environments.

AHE 612. RESEARCH PERSPECTIVES IN EDUCATION. (3 Credits)
Research perspectives, how they are influenced by worldviews, and how these worldviews influence research.
Equivalent to: ED 612
Recommended: AHE 562 and completion or concurrent enrollment in an introductory statistics course

AHE 613. RESEARCH ANALYSIS AND INTERPRETATION IN EDUCATION. (3 Credits)
Critical analysis of scholarly studies in education from a variety of research perspectives.
Equivalent to: ED 613
Recommended: AHE 612 and completion or concurrent enrollment in an intermediate statistics course

AHE 614. ADVANCED RESEARCH METHODS IN EDUCATION. (1-3 Credits)
Selected topics in research methods as appropriate for research perspectives in education. May be repeated.
Equivalent to: ED 614
This course is repeatable for 6 credits.
Recommended: AHE 613

AHE 615. RESEARCH ISSUES. (3 Credits)
A core course in the College of Education's doctoral program that focuses on research issues.
Prerequisites: (AHE 612 with C or better and AHE 613 [C] and AHE 614 [C])

AHE 616. QUANTITATIVE ANALYSIS IN EDUCATIONAL RESEARCH II. (3 Credits)
Develop conceptual and practical understanding of research and evaluation in higher education. Course topics include basic statistics, survey design, data analysis, and assessment issues. As an advanced statistics course, students will have the opportunity to apply concepts and gain direct research experience by conducting an original research project.
Prerequisites: AHE 611 with C or better

AHE 618. QUALITATIVE ANALYSIS IN EDUCATIONAL RESEARCH. (3 Credits)
Introduces learners to a variety of qualitative research perspectives and methodologies. Participants will examine these approaches by critiquing a scholarly article containing qualitative methods; formulating qualitative questions; writing a short proposal; collecting, coding, and analyzing data; and writing a final synthesis paper.

AHE 621. LEADERSHIP IN STUDENT SERVICES. (3 Credits)
Exploration of significant issues in design and delivery of student services in community college and higher education settings. Group discussion, model building, problem posing, issues analysis, and theory applications are employed. Students will reflect on current and future practices in student services, including emerging approaches to leadership.
Equivalent to: ED 621

AHE 638. HISTORY OF HIGHER EDUCATION. (3 Credits)
Surveys American higher education across 200-plus years of American history, with a specific emphasis in this section on the American community college.

AHE 640. HIGHER EDUCATION ADMINISTRATION. (3 Credits)
Current leadership and management theories and models, systems of organization, patterns of internal and external governance, and issues in institutional planning and advancement in higher education.
Equivalent to: ED 640

AHE 643. ORGANIZATION THEORY-HIGHER EDUCATION. (3 Credits)
An introduction to organizational theory (OT). The texts allow us to explore how systems thinking is applied to our world, and how we can use it to better understand the nature of human social engagement. Both OT and living systems theories are deeply associated with improvement and change theories in higher education settings and business.
Counseling

COUN 421. PERSONAL GROWTH AND WELLNESS IN THE MODERN WORLD. (3 Credits)
Explores social and emotional adjustment, growth, and wellness within current social contexts. Examines challenges to wellness and the role of normal development, self-help, and the helping professions in the growth process.

COUN 441. INTRODUCTION TO PROFESSIONAL COUNSELING. (3 Credits)
Provides students with an overview of the counseling profession that includes the history and philosophical foundations of the profession and roles and functions of professional counselors. The course content will critically engage the privilege and responsibility of the counseling profession in a multicultural society.

COUN 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COUN 501. RESEARCH. (1-16 Credits)
Equivalent to: TCE 501
This course is repeatable for 16 credits.

COUN 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 502
This course is repeatable for 16 credits.

COUN 503. THESIS. (1-16 Credits)
Equivalent to: TCE 503
This course is repeatable for 999 credits.

COUN 505. READING AND CONFERENCE. (1-3 Credits)
Equivalent to: TCE 505
This course is repeatable for 16 credits.

COUN 506. PROJECTS. (1-3 Credits)
Equivalent to: TCE 506
This course is repeatable for 16 credits.

COUN 507. SEMINAR. (1-3 Credits)
Equivalent to: TCE 507
This course is repeatable for 16 credits.

COUN 508. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 508
This course is repeatable for 16 credits.

COUN 509. PRACTICUM. (1-16 Credits)
Designed to develop competencies in basic skills, facilitative dimensions, and counseling process. Self-critique, peer-critique, and supervisor-critique of videotaped interview. Written self-critique, oral case presentation and charting skills are learned. Graded P/N.
Equivalent to: TCE 509
This course is repeatable for 16 credits.

COUN 510. INTERNSHIP. (1-18 Credits)
The internship is the culminating field experience of the MS in Counseling program. It is designed to provide students with an on-site placement in a public or private mental health or school setting that will create the necessary bridge between training and professionalism. Students are expected to function per the expectations of other full-time employees and counseling staff at the internship site. Graded P/N.
Equivalent to: TCE 510
This course is repeatable for 16 credits.
COUN 513. COUNSELING PRE-PRACTICUM. (3 Credits)
Designed to develop competencies in basic counseling skills and processes. Self-critique, peer-critique, and supervisor critique of videotaped interviews with peer clients. A pass requires at least B level work. Graded P/N.
Equivalent to: TCE 513
This course is repeatable for 6 credits.

COUN 514. PRACTICUM IN COUNSELING. (1-3 Credits)
Designed to develop competencies in basic skills, facilitative dimensions, and counseling process. Self-critique, peer-critique, and supervisor-critique of videotaped interview. Written self-critique, oral case presentation and charting skills are learned. A pass requires at least B level work. Graded P/N.
Equivalent to: TCE 514
This course is repeatable for 9 credits.

COUN 515. COUNSELING INTERNSHIP. (1-15 Credits)
The internship is the culminating field experience of the MS in Counseling program. It is designed to provide the student with an on-site placement in a public or private mental health or school setting that will create the necessary bridge between training and professionalism. Graded P/N.
Equivalent to: TCE 515
This course is repeatable for 24 credits.

COUN 530. FUNDAMENTALS OF COUNSELING. (3 Credits)
Exploration of basic helping processes appropriate in a variety of settings. Designed for students planning on working in a human service profession, such as counseling, teaching, nursing, medicine, law. A variety of skills and techniques are demonstrated and practiced through videotape and role play, and review of ethical standards of conduct.
Equivalent to: CSSA 530, TCE 530

COUN 531. DEVELOPMENTAL PERSPECTIVES IN COUNSELING. (3 Credits)
A study of affective, behavioral, cognitive, physical, and moral development for human growth and maturation. Theories of personality and learning that affect normal and non-normal development. Relationship of understanding human development to the counseling profession.
Equivalent to: TCE 531

COUN 532. SOCIAL AND CULTURAL PERSPECTIVES IN COUNSELING. (3 Credits)
Social and cultural factors effecting counseling. Includes studies of change, ethnic groups, subcultures, changing roles of women, sexism, urban and rural societies, population patterns, cultural mores, use of leisure time, and differing life patterns.
Equivalent to: TCE 532

COUN 533. ADDICTIVE BEHAVIOR COUNSELING. (3 Credits)
Techniques for addictive behavior assessment and counseling. Specific addictions covered include substance abuse, gambling, and eating disorders.
Equivalent to: TCE 533

COUN 536. APPLIED PSYCHOPHARMACOLOGY FOR COUNSELORS. (3 Credits)
Acquaints counseling students with the fundamentals of psychotropic drugs. Basics of pharmacology, adverse effects, indications, and drug interactions will be discussed. Boundaries of practice and practical issues of assessment and referral will be covered. The overall aim of the course is to provide information about psychopharmacology to the non-medical mental health care provider so that she or he can be a more informed member of the mental health care team. This course does not purport to prepare the student to be any part of the pharmacological prescriptive process. That is the purview of the medically trained person.
Equivalent to: TCE 536

COUN 540. NEW VISION SCHOOL COUNSELING: ACADEMIC ACHIEVEMENT. (3 Credits)
Participants will be able to implement research-based educational practices in: 1. Individual and group academic achievement counseling. 2. Consulting with parents, teachers, and schools regarding academic achievement. 3. Utilizing culturally competent practices in addressing academic achievement issues. 4. Applying the appropriate legal and ethical guidelines to work in the academic domain.
Equivalent to: TCE 540

COUN 541. THE COUNSELING PROFESSION. (3 Credits)
Provides the foundation for becoming a counselor and explores the psychological and philosophical ramifications of the counselor in a changing world. Topics will include values in counseling, ethical and legal issues in counseling, research in counseling, and maintaining a professional identity.
Equivalent to: TCE 541

COUN 546. LEADERSHIP OF SCHOOL COUNSELING PROGRAMS. (3 Credits)
Designed to prepare school counselors to lead teams in the development and implementation of comprehensive school counseling programs. Principles of leadership, system change, and advocacy are introduced. State and National Comprehensive School Counseling models are examined.
Equivalent to: TCE 546

COUN 548. SPECIAL EDUCATION ISSUES IN COUNSELING. (3 Credits)
Addresses various educational disability categories, the fundamentals of special education law, the special education assessment process, the special education definition of emotional/behavioral disorders, and the counselor’s role in supporting children with special emotional needs.
Equivalent to: TCE 548

COUN 550. FOUNDATIONS OF MENTAL HEALTH COUNSELING. (3 Credits)
Addresses the foundations of mental health counseling: (1) historical, philosophical, societal, cultural, economic, and political dimensions of, and current trends in, the mental health movement; (2) roles, functions, preparation standards, credentialing, licensure and professional identity of mental health counselors, (3) policies, laws, legislation, recognition, reimbursement, right-to-practice, and other issues relevant to mental health counseling.
Equivalent to: TCE 550

COUN 551. THEORY AND TECHNIQUES OF COUNSELING I. (3 Credits)
Basic concepts and facilitative skills of helping relationships. Introduction and overview of counseling theories and their related processes and techniques.
Equivalent to: TCE 551
COUN 552. THEORY AND TECHNIQUES OF COUNSELING II. (3 Credits)
Continued development of the theories and techniques of counseling including identification of the counseling process. Emphasis on personality development and affective, behavioral and cognitive approaches.
Equivalent to: TCE 552
Recommended: COUN 551

COUN 556. INTRODUCTION TO RESEARCH METHODS IN COUNSELING. (3 Credits)
An introductory course for master's level students. Explains basic evaluation, quantitative and qualitative research methods in the counseling profession; action research and the fundamental statistical procedures used in the interpretation and use of research studies.

COUN 557. APPRAISAL OF THE INDIVIDUAL. (3 Credits)
Development of framework for understanding the individual; methods for data gathering and assessment; individual and group testing; case study approaches; observational, sociometric, and environmental procedures; study of individual differences. Ethnic, cultural, and sex factors are emphasized.
Equivalent to: TCE 557
Recommended: Basic statistics course.

COUN 558. LIFESTYLE AND CAREER DEVELOPMENT. (3 Credits)
Major theoretical approaches to career development; available resources for educational and occupational assessment; procedures to enhance career exploration, planning, and placement. Emphasis is on the decision-making process and issues of career counseling with special populations.
Equivalent to: TCE 558

COUN 559. GROUP COUNSELING PROCEDURES. (3 Credits)
A conceptual and experiential introduction to group dynamics. Group counseling approaches and models; issues of group leadership; styles of leadership and group facilitation skills. Consideration is given to group counseling goals, composition, phases and research.
Equivalent to: TCE 571

COUN 567. FAMILY COUNSELING. (3 Credits)
An overview of the major theoretical approaches to family counseling will be covered. Through the use of readings, demonstrations, and videos the student will become familiar with systems foundations, the history of family counseling, family roles, interaction patterns, and decision-making processes.
Equivalent to: TCE 575

COUN 568. APPLIED PSYCHOPATHOLOGY AND PSYCHODIAGNOSTICS. (3 Credits)
Addresses the principles of diagnosis of psychopathology and the use of current diagnostic tools, including the current edition of the Diagnostic and Statistical Manual (DSM). Includes psychiatric terminology, treatment, current research, cross cultural impact, ethical implications, and goal planning related to mental health processes and case management.
Equivalent to: TCE 577
Recommended: COUN 541 and COUN 551 and COUN 552.

COUN 571. GROUP COUNSELING II. (3 Credits)
Trauma-informed counseling methods for promoting client wellness and resilience are addressed.
Prerequisites: COUN 578 with C or better
Recommended: COUN 509

COUN 572. CROSS-CULTURAL COUNSELING. (3 Credits)
Cognitive and experimental study of social and psychological variables influencing the cross-cultural counseling relationship. Social and psychological experiences of selected subcultures. Relevant assessment instruments and current literature, methods and outcome studies.
Equivalent to: TCE 581

COUN 573. MULTICULTURAL COUNSELING II. (3 Credits)
Further explores multicultural counseling by studying in-depth the experience of specific student populations and their unique strengths and needs. Students will gain understanding of the specialized school programs and state and national regulations that support a variety of learners as well as the theories and research related to language acquisition to support ELL and bilingual students in the PK-12 system. Students will engage in authentic experiences and assignments to enrich their understanding of sub-populations of students and their families to enhance their cultural responsiveness with those specific groups of learners.
Prerequisites: COUN 581 with C or better

COUN 574. CRISIS, TRAUMA, AND GRIEF COUNSELING. (3 Credits)
The theory and pragmatics of crisis, trauma and grief counseling are addressed.
Equivalent to: TCE 578
COUN 603. THESIS. (1-16 Credits)
Equivalent to: TCE 603
This course is repeatable for 999 credits.

COUN 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: TCE 605
This course is repeatable for 16 credits.

COUN 606. PROJECTS. (1-16 Credits)
Equivalent to: TCE 606
This course is repeatable for 16 credits.

COUN 607. SEMINAR. (1-16 Credits)
Equivalent to: TCE 607
This course is repeatable for 16 credits.

COUN 608. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 608
This course is repeatable for 16 credits.

COUN 609. PRACTICUM IN COUNSELING. (1-12 Credits)
Specialized counseling experiences supervised by a professional. Emphasis is on development of advanced skills in counseling specific to a population.
Equivalent to: TCE 609
This course is repeatable for 16 credits.

COUN 610. INTERNSHIP IN COUNSELING. (1-15 Credits)
Designed to provide experiences in development of teaching and supervision skills in preparation as a counselor educator and supervisor.
Equivalent to: TCE 610
This course is repeatable for 15 credits.

COUN 612. RESEARCH PERSPECTIVES IN EDUCATION. (3 Credits)
Research perspectives, how they are influenced by worldviews, and how these worldviews influence research.
Equivalent to: TCE 612
Recommended: COUN 562 and completion or concurrent enrollment in an introductory statistics course

COUN 613. RESEARCH ANALYSIS AND INTERPRETATION IN EDUCATION. (3 Credits)
Critical analysis of scholarly studies in education from a variety of research perspectives.
Equivalent to: TCE 613
Recommended: (TCE 612 or COUN 612) and completion or concurrent enrollment in an intermediate statistics course

COUN 614. ADVANCED RESEARCH METHODS IN EDUCATION. (1-3 Credits)
Selected topics in research methods as appropriate for research perspectives in education.
Equivalent to: TCE 614
This course is repeatable for 6 credits.
Recommended: COUN 613

COUN 616. UNIVERSITY LEVEL INSTRUCTIONAL THEORY AND METHODS. (3 Credits)
Addresses general university level instructional theory and methods as well as pedagogy specific to counselor education.
Equivalent to: TCE 616

COUN 617. ADVANCED COUNSELOR SUPERVISION. (3 Credits)
Advanced theory and techniques in counselor supervision. Pedagogical issues in training supervisors are addressed.
Equivalent to: TCE 617

COUN 618. PRACTICUM IN COUNSELING. (1-12 Credits)
Specialized counseling experiences supervised by a professional. Emphasis is on development of advanced skills in counseling specific to a population.
Equivalent to: TCE 618
This course is repeatable for 16 credits.

COUN 619. INTERNSHIP IN COUNSELING. (1-12 Credits)
Designed to provide experiences in development of teaching and supervision skills in preparation as a counselor educator and supervisor.
Equivalent to: TCE 619
This course is repeatable for 16 credits.

COUN 621. ADVANCED TOPICS IN EDUCATION. (3 Credits)
Advanced critical study of theory and research related to specific topics of counseling and counselor education.
Equivalent to: TCE 621
This course is repeatable for 16 credits.

COUN 632. ADVANCED COUNSELING THEORY. (3 Credits)
The goal of this course is to develop in each student an advanced level of understanding and skill in emergent counseling models.
Equivalent to: TCE 632

COUN 633. ADVANCED COUNSELING PRACTITIONER I. (3 Credits)
Assists the advanced counseling practitioner with their knowledge and skills in training, leadership, and writing.
Equivalent to: TCE 633

COUN 634. ADVANCED COUNSELING PRACTITIONER II. (3 Credits)
Addresses the theory, science, pragmatics and pedagogy of evidence-based practices in professional counseling.
Equivalent to: TCE 634

COUN 662. COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS I. (3 Credits)
Part I of a three-course sequence designed to prepare students to meet the CACREP doctoral standards for quantitative research methods in counselor education. Topics addressed in course I include application of the following in counselor education research: (1) data scales and scale transformation, (2) frequency distributions and histograms, (3) measures of central position, (4) variability, (5) characteristics of data curves, (6) normality, (7) measures of variability, (8) the statistical hypothesis, (9) statistical errors (Type I/Type II), (10) power analysis, and (11) statistical correlation.
Equivalent to: TCE 662
Recommended: COUN 562.

COUN 663. COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS II. (3 Credits)
Part II of a three-part course sequence designed to prepare students to meet the CACREP doctoral standards for quantitative research methods in counselor education. Topics addressed in course II include application of the following in counselor education research: (1) a review of the dependent variable, normal curve, Type I and Type II errors, power analysis, and criteria for selecting statistical tools, (2) significance tests, including Chi-square t-test, one-factor analysis of variance, multiple comparison tests (L.S.D. and Tukey’s HSD), two-factor analysis of variance, statistical interaction (ordinal and disordinal), linear regression, factor analysis, and analysis of covariance.
Equivalent to: TCE 663
COUN 664. COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS III. (3 Credits)
Part III of a three-course sequence designed to prepare students to meet the CACREP doctoral standards for quantitative research methods in counselor education. Topics addressed in course III include application of the following in counselor education research: (1) multiple regression, (2) path analysis, (3) confirmatory factor analysis, analysis, (4) logistic regression, (5) reliability and generalizability theory, (6) cluster analysis, (7) structural equation modeling, and (8) single subject designs.
Equivalent to: TCE 664

COUN 665. PUBLICATION METHODS IN COUNSELOR EDUCATION. (3 Credits)
Teaches doctoral students how to write theses, grant reports, peer-reviewed journal articles, and textbook chapters.
Equivalent to: TCE 665

COUN 667. ADVANCED ASSESSMENT IN COUNSELING. (3 Credits)
Explores current issues in the use of assessment in counseling, best practices in instrument development, and best practices in assessment pedagogy.
Equivalent to: TCE 667

COUN 668. ADVANCED CAREER DEVELOPMENT AND CONSULTATION IN COUNSELING. (3 Credits)
An advanced course surveying past, current, and possible future technical and philosophical perspectives concerning career development and counseling. Issues in consultation, social change theory, and advocacy action planning are also reviewed in light of their impact on future counseling practitioners. Pedagogical methods for presenting current issues in career development, consultation, social change theory and advocacy action planning are a major focus of the class.
Equivalent to: TCE 668
Recommended: COUN 568 and COUN 598.

COUN 671. ADVANCED GROUP COUNSELING. (3 Credits)
Provides learning experiences beyond the entry level in group counseling. Theoretical and pedagogical innovations in this area are discussed.
Equivalent to: TCE 671

COUN 681. ADVANCED DIVERSITY AND SOCIAL JUSTICE IN COUNSELOR EDUCATION. (3 Credits)
Addresses pedagogy relevant to multicultural, diversity, and social justice issues and the role of racial, ethnic, and cultural heritage, nationality, socioeconomic status, family structure, age, gender, sexual orientation, religious and spiritual beliefs, occupation, cultural, and mental status, local, regional, national, international perspective, and issues of equity such as oppression, power and privilege in counselor education.
Equivalent to: TCE 681
Recommended: COUN 581

COUN 696. COUNSELOR EDUCATION. (3 Credits)
Orientation to the profession of counselor education. Specific topics include: (1) history and organization of the profession, (2) program accreditation standards and practices, (3) instructional theory and methods relevant to counselor education, and (4) ethical and legal considerations in counselor education.
Equivalent to: TCE 696

COUN 697. COUNSELOR SUPERVISION. (3 Credits)
Practical experience for counseling professionals who have responsibility directing personal and professional development of counselors, promoting counselor competency, and developing and implementing counseling services and programs. Theoretical models of supervision are utilized to develop supervisor roles.
Equivalent to: TCE 697

Education

ED 199. SPECIAL TOPICS. (1-16 Credits)
Students in this course receive training and experience in one-on-one and group tutoring in varied courses. They are then assigned tutees.
Equivalent to: TCE 199
This course is repeatable for 16 credits.

ED 216. *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY. (3 Credits)
Introduction to the historical, social, philosophical, political, legal and economic foundations of education in Oregon, the United States, and other countries in order to provide a framework from which to analyze contemporary educational and environmental issues in various schools, communities, and workplaces. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ED 216H, TCE 216

ED 216H. *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY. (3 Credits)
Introduction to the historical, social, philosophical, political, legal and economic foundations of education in Oregon, the United States, and other countries in order to provide a framework from which to analyze contemporary educational and environmental issues in various schools, communities, and workplaces. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ED 216

ED 219. CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION. (3 Credits)
Examination of the context of working with students, schools, communities, and workplaces; the diversity of learning cultures (e.g., urban, suburban, rural) and the diversity among learners within those different cultures; and the influence of culture on one’s learning.
Equivalent to: TCE 219

ED 253. LEARNING ACROSS THE LIFESPAN. (3 Credits)
An exploration of how learning occurs at all ages from early childhood through adulthood. Covers major and emerging theories and styles, self-reflection on implications of how learning occurs for self and others, and the impact of these issues on the development and delivery of instruction.
Equivalent to: TCE 253

ED 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: TCE 299

ED 309. FIELD PRACTICUM. (3-6 Credits)
Placement in either an elementary, middle or secondary school. To assist students to develop competencies in dealing with children or adolescents according to the individual major of the university student.
Equivalent to: TCE 309
This course is repeatable for 18 credits.

ED 310. INTERNSHIP/WORK EXPERIENCE. (1-18 Credits)
This course is repeatable for 18 credits.
ED 340. SUPPORTIVE DIFFERENTIATED ENVIRONMENTS. (3 Credits)
Addresses special abilities and needs of learners and helps prepare teachers to develop strategies and instructional practices for diverse learners and students with exceptionalities in a supportive and inclusive classroom. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: TCE 340

ED 394. DIFFERENTIATION IN THE ELEMENTARY CLASSROOM. (2 Credits)
The role of culture, language, and group identification in learning will be examined and applied to the consideration of differentiated instructional strategies in grades K-5. Students will learn strategies teachers use to help differentiate instruction to meet the diverse needs of students in the elementary classroom.
Equivalent to:

ED 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: TCE 399
This course is repeatable for 16 credits.

ED 401. RESEARCH. (1-16 Credits)
Equivalent to: TCE 401
This course is repeatable for 16 credits.

ED 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 402
This course is repeatable for 16 credits.

ED 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ED 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: TCE 405
This course is repeatable for 16 credits.

ED 406. PROJECTS. (1-3 Credits)
Equivalent to: TCE 406
This course is repeatable for 16 credits.

ED 407. SEMINAR. (1-16 Credits)
Equivalent to: ED 407H, TCE 407
This course is repeatable for 16 credits.

ED 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ED 407, TCE 407
This course is repeatable for 16 credits.

ED 408. WORKSHOP. (1-3 Credits)
Equivalent to: ED 408H, TCE 408
This course is repeatable for 16 credits.

ED 408H. WORKSHOP. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ED 408, TCE 408H
This course is repeatable for 16 credits.

ED 409. PRACTICUM/CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: TCE 409
This course is repeatable for 16 credits.

ED 410. INTERNSHIP/WORK EXPERIENCE. (1-18 Credits)
Equivalent to: TCE 410
This course is repeatable for 18 credits.

ED 411. EDUCATIONAL PSYCHOLOGY, LEARNING AND DEVELOPMENT. (3 Credits)
An opportunity to begin the transition from student to teacher. Explores the relationship between human development and learning through the life cycle.
Equivalent to: TCE 411

ED 412. LEARNING STYLES AND NEEDS IN ADOLESCENCE. (2 Credits)
Exploration of the particular learning styles and needs of the adolescent, major and emerging learning theories, individual learning styles including one's own learning styles, self-reflection on implications of how learning occurs, and the impact of these issues on the development and delivery of instruction.
Equivalent to: TCE 412

ED 413. LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT. (3 Credits)
Creating a positive culture in the classroom, managing student behavior, and engaging students in critical learning discourse are challenges faced by all educators. Students will learn to develop the components of a productive and safe learning environment.

ED 414. LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT. (2 Credits)
Students will expand their knowledge about constructing a positive K-12 classroom environment to a productive learning environment accommodated to fit the needs of a diversified student population.
Prerequisites: ED 413 with D- or better

ED 420. CLASSROOM MANAGEMENT. (3 Credits)
Build knowledge and learn techniques for cultivating a positive learning environment and for managing classrooms. Learn through examining the literature and observing relevant learning environments and classrooms. Explore factors that influence student behavior, including those associated with social and/or multicultural student populations.

ED 424. TEACHER AS REFLECTIVE PRACTITIONER. (2 Credits)
Designed to help teachers make complex judgments based upon their knowledge and understanding of their students, the curriculum, and larger social and cultural issues through reflective practice. Problem solving related to teaching with strong focus on generating new knowledge about teaching, learning, and assessment.
Prerequisites: ED 407 with C- or better and ED 410 [C-]

ED 425. CURRICULUM IMPLEMENTATION AND INSTRUCTIONAL STRATEGIES 7-12. (4 Credits)
The relationship of theory to practice in teaching the content areas in grades 7-12 is examined. General curriculum trends as well as content selection in specific endorsement/subject areas are explored. This course is preparation for and is coordinated with part-time student teaching.
Equivalent to: TCE 425

ED 427. ASSESSMENT FOR K-12 INSTRUCTION. (2 Credits)
Students study and practice the administration, interpretation, and design of assessments for groups and individuals within the content area. Students will develop an understanding of a variety of assessment strategies for K-12 education that will enhance their understandings of the role of assessment in learning and curriculum design.
Equivalent to: TCE 427
ED 429. CURRICULUM, INSTRUCTION, AND ASSESSMENT FOR CTE. (3 Credits)
Build knowledge and skills in curriculum design, instructional strategies, and assessment for successful teaching in a Career and Technical Education and other specialty areas: (a) Agriculture Food and Natural Resource Systems, (b) Arts, Information and Communications, (c) Business Management, (d) Health Sciences (e) Human Resources, (f) Industrial and Engineering Systems, (g) Family and Consumer Sciences, (h) Career Trades.

ED 440. HUMAN DEVELOPMENT AND PSYCHOLOGY OF THE ADOLESCENT. (3 Credits)
Examines research from psychology, human development, and neuroscience to provide a holistic understanding of adolescents and learning with a focus on the middle/secondary student. Investigates the influence of family, neighborhood, peer, and school contexts on brain development; identity formation; and the challenges and opportunities of adolescence.

ED 450. FOUNDATIONS OF EDUCATION AND PLANNING. (4 Credits)
The first of three courses examining the iterative cycle of curriculum planning, instruction and assessment. An introduction to learning theory and the relationship between teaching and learning provide the foundation. An overview of the complete teaching cycle leads to a focus on curriculum planning based on state standards.

ED 451. ASSESSMENT. (4 Credits)
Assessment for and of learning and its importance to student engagement and advancement. Formal and informal writing derived from multiple revisions will result in documents intended for different audiences including parents, school administrators, and national assessment prompts citing research-based practices.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ED 450 with C or better

ED 452. USING DATA TO SUPPORT ALL STUDENTS. (3 Credits)
Teacher candidates will gather and analyze student data to inform instructional practice devoted to enhancing student learning; develop data literacy skills; differentiate instruction for targeted groups and individualized student learners while continuing to foster higher-order thinking and communication skills in the whole class: analyze patterns and gaps in individualized student learning; apply differentiated instruction and assessment strategies to support student growth; engage learners in goal setting; and identify teaching and assessment strategies to work with students with exceptional needs.
Prerequisites: ED 451 with C or better

ED 456. STRATEGIES FOR TEACHING LANGUAGE ARTS AND SOCIAL STUDIES. (3 Credits)
Exploration of language arts and social studies programs (e.g., children's literature, writing, special needs, spelling, and cultural factors). Development of research-based teaching strategies and assessment. Focuses on the development of inquiry approaches that reflect interdisciplinary curriculum as well as subject-specific pedagogy in the teaching of both social studies and language arts.
Equivalent to: TCE 456
Recommended: ED 216 and ED 219 and ED 253

ED 457. TEACHING ELEMENTARY MATHEMATICS FOR UNDERSTANDING. (3 Credits)
Part of the Education Double Degree. Explores the teaching of mathematics in K-8 classrooms in a manner consistent with state and national standards. Students learn teaching strategies that incorporate the development of mathematical models and mental constructs.
Equivalent to: TCE 457
Recommended: MTH 211 and MTH 212 and MTH 390

ED 458. STRATEGIES FOR TEACHING WELLNESS AND FINE ARTS. (2 Credits)
Exploration of recent trends and research-based practices in the teaching of wellness, physical education, and fine arts. Includes strategies, assessments, special needs, integrating curriculum through developmentally appropriate practices, content standards, and the value of developing holistic learners through an effective wellness and fine arts program.
Equivalent to: TCE 458
Recommended: ED 216 and ED 219 and ED 253

ED 459. STRATEGIES FOR TEACHING PHYSICAL EDUCATION HEALTH & WELLNESS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of physical education, health, and wellness in elementary school. Includes instructional strategies for developing holistic learners through an effective wellness program.

ED 465. ELEMENTARY METHODS: LITERACY. (2-4 Credits)
Understanding the theoretical and developmental foundations for literacy programs K-5; targeted reading, writing, listening, vocabulary, and speaking skill needs assessments; organizational strategies for teaching literacy; understanding dyslexia and how to differentiate instruction for students with dyslexia; and the integration of cultural diversity and social justice into literacy learning.
This course is repeatable for 4 credits.

ED 466. ELEMENTARY METHODS II: MATHEMATICS. (4 Credits)
Exploration of the teaching of early childhood/elementary school mathematics with emphases on problem solving, connections, representation, communication, reasoning and proof. Course will incorporate the development of mathematical models and mental constructs. Research-based, developmentally appropriate and culturally relevant practices will be incorporated into lessons.

ED 467. ELEMENTARY METHODS III: NATURAL AND SOCIAL SCIENCE. (4 Credits)
Inquiry approaches to the teaching and learning of the natural and social sciences are used to explore the structure of the disciplines and support the creation of instructional units that develop disciplinary knowledge and practices/skills while highlighting cross-cutting themes. Scientific literacy and civic competence are emphasized.

ED 468. ELEMENTARY METHODS IV: LANGUAGE ARTS. (4 Credits)
This course will build on ED 465: Elementary Methods I: Literacy. Development of pedagogy in teaching of reading to elementary-aged students, including the teaching of vocabulary, comprehension, phonics, fluency and motivation to read. Use of children's literature, assessment approaches, and special needs students are also addressed. Students will gain a deeper level of understanding in how to differentiate the teaching of reading at grades K-5, how to run a Writers' Workshop, and how to integrate literacy into other content areas.
Prerequisites: ED 465 with C or better
ED 469. STRATEGIES FOR TEACHING THE FINE ARTS. (1 Credit)
Exploration of recent trends and research-based practices in the
教学 of performing arts (dance, music, theater) and the visual arts
in elementary school. Includes instructional strategies for developing
holistic learners though an effective fine arts program.

ED 470. BILITERACY INSTRUCTION. (3 Credits)
Explores literacy development in Spanish and English. Examines
differences in literacy development across the two languages, as well
as pedagogical approaches that leverage students’ home language
and literacy practices. Explores equity and bias in classroom language
practices. Taught bilingually in Spanish and English.
Prerequisites: ED 472 (may be taken concurrently) with C or better

ED 471. MULTILINGUAL LINGUISTICS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics,
pragmatics, and discourse. Focuses on academic language development
and teaching implications for emergent bilingual students in Spanish-
English K-12 dual language programs. Taught bilingually in Spanish and
English.
Prerequisites: ED 472 (may be taken concurrently) with C or better

ED 472. FOUNDATIONS OF ESOL EDUCATION. (3 Credits)
Examines characteristics of English language learners (ELLs), key
theories in language acquisition, the role of culture in language
development, and instructional program models for ELLs, while
considering implications for classroom instruction.
Equivalent to: TCE 472

ED 473. INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION. (3 Credits)
Examines characteristics of standards-based content-area instruction
for emergent bilinguals. Includes integration of content and language
development, classroom-based assessment, and use of technology to
support student learning.
Prerequisites: ED 472 with C or better
Equivalent to: TCE 473

ED 474. PROJECT-BASED MATHEMATICS. (3 Credits)
Building on the foundational concepts covered in ED 457 and ED 466/
ED 566, students will plan and apply project-based lessons. Students will
transfer knowledge and skills of mathematics to real world problems and
will learn to teach with a project-based approach.

ED 475. INTEGRATED STEM. (3 Credits)
Students will continue to develop their pedagogical content knowledge
in science, technology, engineering, mathematics, and integrated STEM.
Students will develop a deeper understanding of the crosscutting
concepts common to all science endeavors and will learn how to use
these concepts to bridge across science or STEM curriculum units.
Students will also examine and develop expertise in using science and
engineering practices to lead students in authentic inquiry. Integrating
crosscutting concepts, science and engineering practices, and
disciplinary core ideas, students will learn and practice the development
of curriculum and instruction utilizing the engineering design process.

ED 476. PARTNERSHIPS AND IDEOLOGIES IN ESOL EDUCATION. (3 Credits)
Considers social and political issues pertaining to educating English
language learners. Focuses on exploring multiple ideologies in ESOL and
building partnerships across schools, families, and communities.
Prerequisites: ED 472 with C or better
Equivalent to: TCE 476

ED 477. DIFFERENTIATION FOR STUDENTS WITH SPECIAL NEEDS. (3 Credits)
Building on the foundational concepts covered in HDFS 431, this course
goes into greater depth on how to provide students with a range of
exceptionalities with education in the least restrictive environment.
Teacher candidates will explore differentiated instruction techniques
for students with special needs that can be used in both the regular
education and pull out Special Education resource classrooms.

ED 478. SPECIAL EDUCATION LAW RIGHTS AND REGULATIONS. (3 Credits)
In-depth review of special education law and regulations that protect
and provide educational rights for students with disabilities. Teacher
candidates will leave the class understanding both the historical and
current legal rights of students receiving special education and how to
best meet those rights in both the regular and special education resource
classrooms.

ED 479. LINGUISTICS FOR TEACHERS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics,
pragmatics, and discourse. Focuses on teaching implications—from
psycholinguistic, sociolinguistic, and critical perspectives—for emergent
bilingual students in P-12 contexts.
Prerequisites: ED 472 with C or better
Equivalent to: TCE 479

ED 480. TEACHING MATH TO SECONDARY LEARNERS IN CONTEXT. (3 Credits)
Enhance and reinforce mathematics embedded within occupational-
specific curricula taught at the secondary level to prepare Career and
Technical Education teachers for licensure.

ED 481. READING AND WRITING FOR SECONDARY LEARNERS IN CONTEXT. (3 Credits)
Enhance and reinforce the authentic reading and writing embedded
within occupationally relevant materials to prepare Career and Technical
Education teachers for licensure.

ED 483. DEVELOPMENTAL READING. (3 Credits)
Development of pedagogy in teaching of reading to elementary-aged
students, including teaching of vocabulary, comprehension, phonics,
fluency and motivation to read. Use of children’s literature, assessment
approaches, and special needs students are also addressed. This is a
PTCE course in the elementary Double Degree Program.
Equivalent to: TCE 483

ED 484. INTRODUCTION TO CAREER AND TECHNICAL EDUCATION. (3 Credits)
A study of the history of Career and Technical Education, the impact of
the educational reform on Career and Technical Education and workforce
development. Topics include leaders in vocational education; legislative
initiatives, social issues, and organizations involved in and impacting
Career and Technical Education.

ED 492. TECHNOLOGY TOOLS FOR TEACHING. (2 Credits)
Teacher candidates will learn the technology skills needed to be
successful as a classroom teacher. Topics range from exploration of how
digital tools can be used in instruction, assessment, communication, and
collaboration in educational settings to bring vibrant energy into student
learning and engagement. The course also covers responsible digital
citizenship, responsible use and ethics of technology in the classroom.
ED 493. READING, LITERATURE, AND LANGUAGE DEVELOPMENT IN THE CONTENT. (2 Credits)
Examination of reading, literature, and language development methods that can be used by middle school and high school teachers to support students’ learning of content area information. Development of specific reading strategies in content areas.
Equivalent to: TCE 493

ED 494. CONTENT STANDARDS AND CURRICULUM DEVELOPMENT FOR HIGH SCHOOL. (3 Credits)
Exploration of content standards, materials and methods appropriate for high school students. Develops skills in work sample methodology through the design of effective instruction, integrating a variety of methods with existing understandings of content area, how people learn, and the diverse communities in which they work.
Equivalent to: TCE 494

ED 496. TECHNOLOGY FOR EDUCATORS. (3 Credits)
Explore the integration of current and emerging technologies into K-12 content areas by engaging learners in real world issues and learning in a social context. Integrate technologies that promote critical thinking, communication, collaboration, and creativity. Discuss technologies in terms of cultural linguistic diversity. Gain transferable skills. Taught via Ecampus only.
Recommended: Basic computer literacy.

ED 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: TCE 499
This course is repeatable for 16 credits.
ED 501. RESEARCH. (1-16 Credits)
Equivalent to: TCE 501
This course is repeatable for 16 credits.
ED 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 502
This course is repeatable for 16 credits.
ED 503. THESIS. (1-16 Credits)
Equivalent to: TCE 503
This course is repeatable for 999 credits.
ED 505. READING & CONFERENCE. (1-16 Credits)
Equivalent to: TCE 505
This course is repeatable for 16 credits.
ED 506. PROJECTS. (1-3 Credits)
Equivalent to: TCE 506
This course is repeatable for 16 credits.
ED 507. SEMINAR. (1-16 Credits)
Equivalent to: TCE 507
This course is repeatable for 16 credits.
ED 508. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 508
This course is repeatable for 16 credits.
ED 509. PRACTICUM. (1-16 Credits)
Equivalent to: TCE 509
This course is repeatable for 16 credits.
ED 510. INTERNSHIP. (1-18 Credits)
By special permission and arrangement.
Equivalent to: TCE 510
This course is repeatable for 40 credits.

ED 513. LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT. (3 Credits)
Creating a positive culture in the classroom, managing student behavior, and engaging students in critical learning discourse are challenges faced by all educators. Students will learn to develop the components of a productive and safe learning environment.
ED 514. LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT. (2 Credits)
Students will expand their knowledge about constructing a positive K-12 classroom environment to a productive learning environment accommodated to fit the needs of a diversified student population.
Prerequisites: ED 513 with B or better

ED 515. LEARNING ENVIRONMENTS III: CULTURES AND COMMUNITIES. (2 Credits)
The third in a series of courses to assist the Teacher candidate in developing a classroom culture of learning that challenges every student to succeed and thrive. Teacher candidates will understand the important role that culture and community play in the teaching and learning process, and develop culturally responsive teaching practices.
Prerequisites: ED 513 with B or better and ED 514 [B]

ED 517. ACADEMIC WRITING FOR MASTER’S STUDENTS. (1 Credit)
A writing refresher that addresses academic voice, style, tone, construction, conventions, and writing style appropriate for master’s-level research papers and capstones.
Equivalent to: TCE 517
This course is repeatable for 2 credits.

ED 518. PROFESSIONAL PRACTICE IN THE TEACHING COMMUNITY. (2 Credits)
The professional themes of communication, collaboration, reflection, knowledge of learners, professional ethics, social justice and cultural understanding will be explored and applied to teaching contexts, behaviors, dispositions, and actions.

ED 519. CAPSTONE: TEACHING AS A PROFESSION. (3 Credits)
Capstone course for the MAT in which teacher candidates further develop their educational philosophy and analyze their professional growth in alignment with national standards.

ED 520. CLASSROOM MANAGEMENT. (3 Credits)
Build knowledge and learn techniques for cultivating a positive learning environment and for managing classrooms. Learn through examining the literature and observing relevant learning environments and classrooms. Explore factors that influence student behavior, including those associated with social and/or multicultural student populations.
Equivalent to: TCE 520

ED 521. FUNDS OF KNOWLEDGE IN EDUCATION. (3 Credits)
An introduction to multicultural education and developing cultural competence by using a funds of knowledge approach. This approach helps educators combine fieldwork and ethnographic research methods to gain cultural competence about the students they serve. Educators explore their own funds of knowledge as well as the children’s through exploring their community and developing activities centered on children’s own connections and resources.
ED 522. RACIAL AND CULTURAL HARMONY IN THE K-12 CLASSROOM. (3 Credits)
An overview of many issues relevant to the increasingly diverse student population in public schools today. It explores how a culturally competent perspective can be incorporated into curriculum design, teaching strategies, and interactions with students and parents. The course is both self-directed and communal, requiring students to respond to the materials and each other, yet at their own pace.
Equivalent to: TCE 522

ED 524. TEACHER AS REFLECTIVE PRACTITIONER. (2-3 Credits)
Designed to help teachers make complex judgments based upon their knowledge and understanding of their students, the curriculum, and larger social and cultural issues through reflective practice. Problem solving related to teaching with strong focus on generating new knowledge about teaching, learning, and assessment.
Equivalent to: TCE 524

ED 528. ASSESSMENT FOR LEARNING. (3 Credits)
Applies the formative learning cycle to through development of an assessment plan. Examines various formative assessment practices that promote higher order thinking and empower students to show evidence of their learning through self-assessment and feedback.
Equivalent to: TCE 528

ED 531. SCIENCE METHODS I: INQUIRY AND THE NATURE OF SCIENCE. (4 Credits)
Introduction to (1) fundamentals of science teaching including the nature of science and inquiry, (2) designing instructional sequences and selecting curriculum resources aligned to state science standards and research-based learning progressions, (3) effective teaching moves, (4) supporting acquisition of academic language, and (5) productive and safe science learning environments.
Equivalent to: SED 513

ED 532. SCIENCE METHODS II: SUPPORTING STUDENTS’ CONCEPTUAL CHANGE. (4 Credits)
Development of skill in identifying and addressing misconceptions or naive conceptions as part of the individualized conceptual change process. Integration of technology tools for instruction and assessment. Development of high-leverage science teaching practices with a focus on enhancing classroom discourse and evidence-based argumentation with a survey of science curriculum models.
Prerequisites: ED 531 with B or better

ED 533. SCIENCE METHODS III: SCIENCE FOR ALL LEARNERS. (4 Credits)
Teaching science as a community of practice means addressing the needs of all learners, particularly those underrepresented in science. Uses technology to enhance high-leverage teaching practices and practices safe and effective laboratory teaching methods. Explores contextualized and interdisciplinary approaches to science education.
Prerequisites: ED 531 with B or better and ED 532 [B]

ED 537. MATHEMATICAL METHODS I: FOUNDATIONS OF NUMERICAL THOUGHT. (4 Credits)
Introduction to the fundamentals of mathematics teaching including the nature and goals of mathematical thinking, numeracy, inquiry, and related academic language of mathematics. Students are introduced to the high high-leverage practices of ambitious mathematics teaching, designing instructional sequences and selecting curriculum resources aligned to state science standards and research-based learning progressions.
Equivalent to: SED 514

ED 538. MATHEMATICS METHODS II: CYCLES OF ENACTMENT. (4 Credits)
Teacher candidates create instructional units based on student knowledge and skill while attending to needed accommodations. Designed to help the teacher candidate select or modify instructional materials based on student prior knowledge, experience, and interests; make accommodations for students; and provide for multiple representations across a unit of instruction.
Prerequisites: ED 537 with B or better

ED 539. MATHEMATICAL METHODS III: MATHEMATICS FOR EVERY LEARNER. (4 Credits)
Teacher candidates will develop practices that support all students, regardless of background or ability. The teacher candidate will design a unit of instruction with complex learning goals that are cross- and multi-disciplinary, draw on multiple perspectives, and invoke higher order thinking and communication skills.
Prerequisites: ED 537 with B or better and ED 538 [B]

ED 540. HUMAN DEVELOPMENT AND PSYCHOLOGY OF THE ADOLESCENT. (3 Credits)
Examines research from psychology, human development, and neuroscience to provide a holistic understanding of adolescents and learning with a focus on the middle/secondary student. Investigates the influence of family, neighborhood, peer, and school contexts on brain development; identity formation; and the challenges and opportunities of adolescence.

ED 542. TEACHER LEADERSHIP. (3 Credits)
Examines current conceptions, research, and philosophies of educational leadership. The goal is to promote teacher-leadership in effective teaching and learning and influence in local educational policies and programs.
Equivalent to: TCE 542

ED 544. TEACHING CRITICAL LITERACY. (3 Credits)
Examines literacy curriculum and teaching practices in various real world contexts, such as critical literacy, supporting second language learners, argumentation, reading engagement and social justice. While still addressing technical dimensions of literacy education, students write critical literacy curricula, take turns leading critical book discussions, and learn to critique text bias. Course challenges students to develop critical consciousness as teachers of literacy in a democracy.

ED 548. STUDENTS WITH SPECIAL NEEDS. (2 Credits)
Examines the broad range of special needs that are represented in today's classrooms. Addresses various types and characteristics of disabilities as well as collaborating with specialists and families with children with special needs. Discussion strategies and instructional practices to enhance the learning of diverse students in the inclusive classroom.

ED 549. TEACHING IN A DIFFERENTIATED AND DIVERSE CLASSROOM. (3 Credits)
Addresses the philosophical framework, strategies, and assessment of differentiation to meet the needs of all students in the classroom.
Equivalent to: TCE 549

ED 550. THE EFFECTIVE TEACHING CYCLE I: FOUNDATIONS AND PLANNING. (4 Credits)
The first of three courses examining the iterative cycle of curriculum planning, instruction, and assessment. An introduction to learning theory and the relationship between teaching and learning provides the foundation. An overview of the complete teaching cycle leads to a focus on curriculum planning based on state standards.
ED 551. THE EFFECTIVE TEACHING CYCLE II: ASSESSMENT. (4 Credits)
The second of three courses examining the iterative cycle of curriculum planning, instruction, and assessment. Learning in this class will concentrate on assessment for and of learning and its importance to student engagement and advancement.
Prerequisites: ED 550 with B or better

ED 558. STRATEGIES FOR TEACHING WELLNESS AND FINE ARTS. (2 Credits)
Exploration of recent trends and research-based practices in the teaching of wellness, physical education, and fine arts. Includes strategies, assessments, special needs, integrating curriculum through developmentally appropriate practices, content standards, and the value of developing holistic learners though an effective wellness and fine arts program.

ED 559. STRATEGIES FOR TEACHING HUMANITIES. (3 Credits)
Pedagogical approaches to teaching language arts and social studies in K-5, multiple subject classrooms. Focus on developing research-based daily lessons and unit plans that integrate curriculum, support national standards, and use an inquiry approach for student learning.

ED 560. CHANGES IN ESOL EDUCATION. (3 Credits)
Explores recent developments in education for K-12 emergent bilingual students, examining changes in theory, policy, and instruction. Practice-based projects draw on new language acquisition theories to address both language and content-knowledge development. Course work intended for K-12 teachers who earned an ESOL endorsement more than five years ago, as well as those with equivalent background knowledge. Recommended: K-12 teaching license with ESOL endorsement

ED 551. ACTION RESEARCH. (1-3 Credits)
Examines action research as a vehicle for teacher and administrator professional development. Specific topics of study include problem posing, data collection and analysis, theory building, and writing the report.
Equivalent to: TCE 561
This course is repeatable for 3 credits.

ED 562. INTRODUCTION TO EDUCATIONAL RESEARCH. (3 Credits)
Explores the purpose and use of social science research in education with emphasis on action and applied research. Designed to help teachers and informal educators to critically read, interpret, and apply research findings to the diverse contexts in which they work, and to become informed consumers of educational research.
Equivalent to: TCE 562

ED 563. STRATEGIES FOR TEACHING PHYSICAL EDUCATION HEALTH & WELLNESS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of physical education, health, and wellness in elementary school. Includes instructional strategies for developing holistic learners though an effective wellness program.

ED 565. ELEMENTARY METHODS: LITERACY. (2-4 Credits)
Understanding the theoretical and developmental foundations for literacy programs K-5; targeted reading, writing, listening, vocabulary, and speaking skill needs assessments; organizational strategies for teaching literacy; understanding dyslexia and how to differentiate instruction for students with dyslexia; and the integration of cultural diversity and social justice into literacy learning. This course is repeatable for 4 credits.

ED 566. ELEMENTARY METHODS: MATHEMATICS. (4 Credits)
Exploration of the teaching of early childhood/elementary school mathematics with emphases on problem solving, connections, representation, communication, reasoning and proof. Course will incorporate the development of mathematical models and mental constructs. Research-based, developmentally appropriate and culturally relevant practices will be incorporated into lessons.

ED 567. ELEMENTARY METHODS: NATURAL AND SOCIAL SCIENCE. (4 Credits)
Inquiry approaches to the teaching and learning of the natural and social sciences are used to explore the structure of the disciplines and support the creation of instructional units that develop disciplinary knowledge and practices/skills while highlighting cross-cutting themes. Scientific literacy and civic competence are emphasized.

ED 569. STRATEGIES FOR TEACHING THE FINE ARTS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of performing arts (dance, music, theater) and the visual arts in elementary school. Includes instructional strategies for developing holistic learners though an effective fine arts program.

ED 570. BILITERACY INSTRUCTION. (3 Credits)
Explores literacy development in Spanish and English. Examines differences in literacy development across the two languages, as well as pedagogical approaches that leverage students’ home language and literacy practices. Explores equity and bias in classroom language practices. Taught bilingually in Spanish and English.
Prerequisites: ED 572 (may be taken concurrently) with C or better

ED 571. MULTILINGUAL LINGUISTICS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics, pragmatics, and discourse. Focuses on academic language development and teaching implications for emergent bilingual students in Spanish-English K-12 dual language programs. Taught bilingually in Spanish and English.
Prerequisites: ED 572 (may be taken concurrently) with C or better

ED 572. FOUNDATIONS OF ESOL EDUCATION. (3 Credits)
Examines characteristics of English language learners (ELLs), key theories in language acquisition, the role of culture in language development, and instructional program models for ELLs, while considering implications for classroom instruction.
Equivalent to: TCE 572

ED 573. INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION. (3 Credits)
Examines characteristics of standards-based content-area instruction for emergent bilinguals. Includes integration of content and language development, classroom-based assessment, and use of technology to support student learning.
Prerequisites: ED 572 with C or better
Equivalent to: TCE 573

ED 574. PROJECT-BASED MATHEMATICS. (3 Credits)
Building on the foundational concepts covered in ED 457 and ED 466/ ED 566, students will plan and apply project-based lessons. Students will transfer knowledge and skills of mathematics to real world problems and will learn to teach with a project-based approach.
ED 575. INTEGRATED STEM. (3 Credits)
Students will continue to develop their pedagogical content knowledge in science, technology, engineering, mathematics, and integrated STEM. Students will develop a deeper understanding of the crosscutting concepts common to all science endeavors and will learn how to use these concepts to bridge across science or STEM curriculum units. Students will also examine and develop expertise in using science and engineering practices to lead students in authentic inquiry. Integrating crosscutting concepts, science and engineering practices, and disciplinary core ideas, students will learn and practice the development of curriculum and instruction utilizing the engineering design process.

ED 576. PARTNERSHIPS AND IDEOLOGIES IN ESOL EDUCATION. (3 Credits)
Considers social and political issues pertaining to educating English language learners. Focuses on exploring multiple ideologies in ESOL and building partnerships across schools, families, and communities.
Prerequisites: ED 572 with C or better
Equivalent to: TCE 579

ED 577. DIFFERENTIATION FOR STUDENTS WITH SPECIAL NEEDS. (3 Credits)
Building on the foundational concepts covered in HDFS 431, this course goes into greater depth on how to provide students with a range of exceptionalities with education in the least restrictive environment. Teacher candidates will explore differentiated instruction techniques for students with special needs that can be used in both the regular education and pull out Special Education resource classrooms.

ED 578. SPECIAL EDUCATION LAW RIGHTS AND REGULATIONS. (3 Credits)
In-depth review of special education law and regulations that protect and provide educational rights for students with disabilities. Teacher candidates will leave the class understanding both the historical and current legal rights of students receiving special education and how to best meet those rights in both the regular and special education resource classrooms.

ED 579. LINGUISTICS FOR TEACHERS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics, pragmatics, and discourse. Focuses on teaching implications—from psycholinguistic, sociolinguistic, and critical perspectives—for emergent bilingual students in P-12 contexts.
Prerequisites: ED 572 with C or better
Equivalent to: TCE 579

ED 582. STRATEGIES FOR DEVELOPING LITERACY. (3 Credits)
Focus on teaching of reading to K-5 students. Instruction in pedagogical techniques and assessment on teaching vocabulary, comprehension, phonics and fluency. Strategies related to motivation to read, integration of cultural diversity and social justice and the needs of diverse learners in literacy development are also addressed.

ED 584. LANGUAGE ARTS METHODS I: ADOLESCENT LITERACY. (4 Credits)
Teaching language arts to middle and high school students requires a deep understanding of how reading and writing to learn occur. Guided by current professional and state literacy standards, students will learn to assess and advance adolescent reading comprehension, and writing and speaking skills.

ED 585. LANGUAGE ARTS METHODS II: STRATEGIES FOR GRADES 5-12. (4 Credits)
Explores the integration and implementation of curriculum and high leverage instructional practices that respond to the learning needs of adolescents in language arts classrooms. Examines the importance of metacognitive strategies in the teaching of content-related skills and concepts, and how to create school cultures that support high achievement.

ED 586. LANGUAGE ARTS METHODS III: CURRICULUM AND THE PROFESSION. (4 Credits)
Learning to teach language arts as a community of practice including the development of high-leverage instructional practices. Focus on enhancing classroom discourse and building student comprehension, meaning construction, interpretation, and response to complex text. Integration of technology tools for instruction and assessment.
Prerequisites: ED 584 with B or better and ED 585 [B]

ED 587. SOCIAL STUDIES METHODS I: ADOLESCENT LITERACY. (4 Credits)
Teaching social studies to middle and high school students requires a deep understanding of how reading and writing to learn occur. Guided by current professional and state literacy standards, students will learn to assess and advance adolescent content reading comprehension, writing and speaking skills.

ED 588. SOCIAL STUDIES METHODS II: STRATEGIES FOR GRADES 5-12. (4 Credits)
Explores the integration and implementation of curriculum and high leverage instructional practices that respond to the learning needs of adolescents in secondary social studies classrooms. Examines the importance of metacognitive strategies in the teaching of content-related skills and concepts, and how to create school cultures that support high achievement.

ED 589. SOCIAL STUDIES METHODS III: CURRICULUM AND THE PROFESSION. (4 Credits)
Learning to teach social studies as a community of practice including the development of high-leverage instructional practices. Focus on curriculum strategies that provide opportunities for learners to develop and use facts, concepts, interpretations, and analyses to build and support arguments. Integration of technology tools for instruction and assessment.
Prerequisites: ED 587 with B or better and ED 588 [B]

ED 590. SOCIAL JUSTICE IN EDUCATION. (3 Credits)
Examines social, environmental and ecological justice in educational settings focusing on bias critique in text, development of social justice curriculum, and creation of an action related to a social justice issue. The interconnectedness of social and ecological justice is also explored. Various international justice standards are used to ground students’ work in curriculum development.
Equivalent to: TCE 590

ED 592. TECHNOLOGY TOOLS FOR TEACHING. (1-2 Credits)
Teacher candidates will learn the technology skills needed to be successful as a classroom teacher. Topics range from exploration of how digital tools can be used in instruction, assessment, communication, and collaboration in educational settings to bring vibrant energy into student learning and engagement. The course also covers responsible digital citizenship, responsible use and ethics of technology in the classroom.
This course is repeatable for 2 credits.
ED 594. DIFFERENTIATION. (2 Credits)
Issues of K-12 learner and the role of culture, language, and group identification in learning will be examined and applied to the consideration of differentiated instructional strategies.

ED 595. EDUCATIONAL DEVELOPMENT. (2 Credits)
Issues of K-12 learner social/emotional/cognitive development across multiple areas of learning will be examined, with consideration given to impact on classroom pedagogy.

ED 596. TECHNOLOGY FOR EDUCATORS. (3 Credits)
Explore the integration of current and emerging technologies into K-12 content areas by engaging learners in real world issues and learning in a social context. Integrate technologies that promote critical thinking, communication, collaboration, and creativity. Discuss technologies in terms of cultural linguistic diversity. Gain transferable skills. Taught via Ecampus only.
Equivalent to: TCE 596
Recommended: Basic computer literacy.

ED 597. K-5 STEM INTEGRATION IN DIVERSE CLASSROOMS. (2 Credits)
An investigation of theory and practice related to science teaching and learning in diverse classrooms through integration of science, math, literacy and social studies.

ED 599. SPECIAL TOPICS. (1-4 Credits)
Equivalent to: TCE 599
This course is repeatable for 90 credits.

ED 601. RESEARCH. (1-16 Credits)
Equivalent to: TCE 601
This course is repeatable for 16 credits.

ED 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 602
This course is repeatable for 16 credits.

ED 603. THESIS. (1-16 Credits)
Equivalent to: TCE 603
This course is repeatable for 999 credits.

ED 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: TCE 605
This course is repeatable for 16 credits.

ED 606. PROJECTS. (1-16 Credits)
Equivalent to: TCE 606
This course is repeatable for 16 credits.

ED 607. SEMINAR. (1-16 Credits)
Equivalent to: TCE 607
This course is repeatable for 16 credits.

ED 608. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 608
This course is repeatable for 16 credits.

ED 609. PRACTICUM/CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: TCE 609
This course is repeatable for 16 credits.

ED 610. INTERNSHIP. (1-15 Credits)
Equivalent to: TCE 610
This course is repeatable for 15 credits.

ED 650. EQUITY AND EDUCATION POLICY. (3 Credits)
Introduces students to key educational policy debates, with a particular focus on attempts to use education policy to advance equity. Examines different visions for the purpose of education and different definitions of equity. Explores the roles of different actors within education policy, including legislators, courts, and non-governmental organizations. Provides students with frameworks for analyzing education policy, which students will then apply to analyze a current policy debate that is of interest to them.

ED 651. RESEARCH BILINGUALISM AND MULTILINGUALISM. (3 Credits)
Develops critical research skills to create new knowledge in the field of multilingualism. Examines inter-disciplinary and intersectional perspectives to consider notions of identity among multilinguals and explore the historical trajectory of bilingualism and multilingualism research. Provides a broad understanding of the theoretical and methodological frameworks used to study bilingualism and multilingualism in globalized contexts.

ED 652. ETHNOGRAPHIC METHODS. (3 Credits)
As an advanced qualitative method class, this course introduces theory and ethnographic research methods by presenting the various ways by which socio-cultural anthropologists observe and analyze phenomena, groups or individuals in everyday language and social practices in their local and global contexts, taking into account issues of language, equity and educational policy. Students will carry out an ethnographic research project of a particular phenomenon they wish to learn more about.
Prerequisites: SED 622 with B or better

ED 653. DISCOURSE, IDENTITY AND EDUCATION. (3 Credits)
Builds a foundation in discourse theory and its applications to identity and education. Includes empirical studies that draw from particular lenses of discourse theory, exemplifying how these scholars organize the design, implementation, and discussion of research around discourse theory. Develops knowledge of discourse theory to propose a study that could be conducted drawing from discourse analytic perspectives.

ED 808. WORKSHOP. (1-4 Credits)
Equivalent to: TCE 808
This course is repeatable for 16 credits.

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SED 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SED 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SED 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SED 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SED 409. FIELD PRACTICUM: SCIENCE AND MATHEMATICS. (3 Credits)
Placement in middle or high school (grades 7-12) to assist in developing competencies with adolescents in science/mathematics classes.
This course is repeatable for 18 credits.

SED 412. TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE. (3 Credits)
Integration of instructional technologies with other strategies to teach math and science in elementary, middle, and secondary schools in the 21st century.
Equivalent to: SED 412H
SED 413. INQUIRY IN SCIENCE AND SCIENCE EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in science as it relates to science education. Students will examine issues relating to integrating scientific understandings and practice into K-12 instruction.

SED 414. INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of mathematics as it relates to mathematics education. Students will examine issues related to integrating mathematical understanding, mathematics standards/curricula, and mathematics-specific strategies in K-12 instruction. Lec/lab.

SED 416. INQUIRY IN SCIENCE AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in mathematics and science as it relates to education. Students will examine issues relating to integrating mathematical and scientific understandings and practices into K-12 education.

SED 419. TEACHING MATHEMATICAL MODELING IN STEM. (3 Credits)
Provides students an overview of the content requirements in the Common Core Standards for Mathematics and the teaching practices that are central to those standards with a focus on the role of mathematical modeling. Students experience content lessons and lessons focused on supporting students in developing understanding of that content.

Recommended: Background in an educational setting or as a pre-service teacher at any level, a K-12 teacher or free-choice learning educator.

SED 431. OVERVIEW OF FREE-CHOICE LEARNING. (3 Credits)
Examines learning that occurs when people believe they have choices over what and how they learn, how much time they spend learning, and what their sources of information are. Covers current research on learning in museums, aquariums, zoos, botanical gardens, science centers, after-school programs, media and apprenticeships.

SED 435. COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES. (3 Credits)
For students interested in improving their ability to communicate their scientific knowledge by helping general public and student audiences learn about ocean sciences in a wide variety of learning settings. Combines instruction in inquiry-based teaching methods and learning theory with work in student's local informal learning settings like museums, zoos, aquariums and libraries.

SED 459. SCIENCE AND THE NATURE OF INQUIRY. (3 Credits)
Focuses on inquiry approaches to the teaching and learning of science. Development of teaching strategies including materials and resources for teaching science using an inquiry approach as well as more teacher-directed approaches.

SED 473. SCIENCE PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 science instruction: learning theory, nature of science, technology integration, and reform recommendations. Lec/lab/rec.

SED 474. MATHEMATICS PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 mathematics instruction: learning theory, nature of mathematics, technology integration, and reform recommendations.

Recommended: Investigation of mathematics as it relates to mathematics education and SED 414.

SED 476. MATHEMATICS PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of additional pedagogical content knowledge in grades 6-12; stress on dominant themes of the school mathematics curriculum including problem solving, reasoning, communication, and connections as well as the integration of technology into the mathematics classroom.

Prerequisites: SED 474 with D- or better.

SED 477. SCIENCE PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of pedagogical content knowledge in grades 6-12; science instruction; learning theory, nature of science, technology integration, and reform recommendations.

Prerequisites: SED 473 with C or better.

SED 499. SPECIAL TOPICS. (3 Credits)
PREREQ: Provisional acceptance to Education Double Degree program. This course is repeatable for 18 credits.

SED 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SED 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

SED 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SED 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SED 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SED 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

SED 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

SED 510. PROFESSIONAL INTERNSHIP: SCIENCE OR MATHEMATICS EDUCATION. (1-16 Credits)
Supervised teaching experience at the elementary, middle or high school level; students experience general classroom and professional responsibilities common to the regular science or mathematics teacher.

This course is repeatable for 16 credits.

SED 511. ANALYSIS OF CLASSROOMS I. (3 Credits)
Observation and analysis of the complex science/ mathematics classroom (grades 3-12) and school culture and their impact on student learning.

SED 512. TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE. (3 Credits)
Integration of instructional technologies with other strategies to teach math and science in elementary, middle, and secondary schools in the 21st century.

SED 513. INQUIRY IN SCIENCE AND SCIENCE EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in science as it relates to science education. Students will examine issues relating to integrating scientific understandings and practice into K-12 instruction.

SED 514. INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of mathematics as it relates to mathematics education. Students will examine issues related to integrating mathematical understanding, mathematics standards/curricula, and mathematics-specific strategies in K-12 instruction. Lec/lab.
SED 516. INQUIRY IN SCIENCE AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in mathematics and science as it relates to education. Students will examine issue relating to integrating mathematical and scientific understandings and practices into K-12 education.

SED 519. TEACHING MATHEMATICAL MODELING IN STEM. (3 Credits)
Provides students an overview of the content requirements in the Common Core Standards for Mathematics and the teaching practices that are central to those standards with a focus on the role of mathematical modeling. Students experience content lessons and lessons focused on supporting students in developing understanding of that content.
Recommended: Background in an educational setting or as a pre-service teacher at any level, a K-12 teacher or free-choice learning educator

SED 520. TECHNOLOGY FOR MATH AND SCIENCE EDUCATION. (3 Credits)
Explore current and emerging technologies applied to math and science learning that promote critical thinking, communication, collaboration, and creativity. Gain technology skills and resources that can be transferred to formal and informal learning environments.
Recommended: Basic computer literacy

SED 531. OVERVIEW OF FREE-CHOICE LEARNING. (3 Credits)
Examines learning that occurs when people believe they have choices over what and how they learn, how much time they spend learning, and what their sources of information are. Covers current research on learning in museums, aquariums, zoos, botanical gardens, science centers, after-school programs, media and apprenticeships.

SED 535. COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES. (3 Credits)
For students interested in improving their ability to communicate their scientific knowledge by helping general public and student audiences learn about ocean sciences in a wide variety of learning settings. Combines instruction in inquiry-based teaching methods and learning theory with work in student's local informal learning settings like museums, zoos, aquariums and libraries.

SED 541. WEATHER CONCEPTS FOR SCIENCE AND MATH TEACHING. (3 Credits)
Science content and pedagogy in learning and teaching basic weather concepts.
Recommended: Background in an educational setting or as a K-12 teacher or free-choice learning educator

SED 550. HIGH QUALITY SCIENCE AND MATHEMATICS INSTRUCTION. (3 Credits)
Explores high quality science and mathematics instruction to prepare professional teachers in science and mathematics. Develops skills in high-leverage instructional practices and reviews research literature that supports these practices. Investigates social justice issues related to systems of schooling in the United States.

SED 552. MATHEMATICS METHODS: PRACTICUM I. (3 Credits)
Theoretical background, practical knowledge, and skills for teaching in mathematics classrooms (grades 3-12). Instructional methods/modes, classroom management, contemporary curriculum goals and instructional planning.

SED 553. SCIENCE METHODS/PRACTICUM I. (3 Credits)
Theoretical background, practical knowledge, and skills for teaching in science classrooms (grades 3-12). Instructional methods/modes, classroom management, contemporary curriculum goals and instructional planning.

SED 554. ENGINEERING AND SCIENCE IN THE LIVES OF STUDENTS. (3 Credits)
Explore the use of construction engineering as a vehicle to make science and math more relevant and useful for the everyday life of students.
Recommended: Background in an educational setting or as a K-12 teacher or free-choice learning educator (eg. museum, science camp)

SED 556. FOSTERING REFLECTIVE DISCOURSE IN SCIENCE AND MATH CONTEXTS. (3 Credits)
Examines ways of speaking that foster learning in science and mathematics contexts such as K-16 classrooms and free-choice learning settings (i.e., museums, zoos, science camps, etc.). Assignments assume the participant is a K-12 teacher or free-choice learning educator enrolled in a graduate licensure program or has access to an educational setting.

SED 573. SCIENCE PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 science instruction: learning theory, nature of science, technology integration, and reform recommendations. Lec/lab/rec.

SED 574. MATHEMATICS PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 mathematics instruction: learning theory, nature of mathematics, technology integration, and reform recommendations.
Recommended: Investigation of mathematics as it relates to mathematics education and SED 414

SED 576. MATHEMATICS PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of additional pedagogical content knowledge in grades 6-12; stress on dominant themes of the school mathematics curriculum including problem solving, reasoning, communication, and connections as well as the integration of technology into the mathematics classroom.
Prerequisites: SED 574 with C or better

SED 577. SCIENCE PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of pedagogical content knowledge in grades 6-12; science instruction: learning theory, nature of science, technology integration, and reform recommendations.
Prerequisites: SED 573 with C or better

SED 580. RESEARCH AND EVALUATION. (3 Credits)
Analysis of qualitative and quantitative empirical research in science education, mathematics education and education in general.
Development of data collection instruments for use by researchers and teachers of science education, mathematics education and education in general, including portfolio and other forms of alternative assessment.

SED 581. PROFESSIONAL DEVELOPMENT AND PRACTICUM IN MATHEMATICS. (3 Credits)
Developing and implementing a program for continuing learning and evaluation in mathematics education.

SED 582. PERSONAL DIMENSIONS OF FREE-CHOICE LEARNING. (3 Credits)
Investigates the fundamental roles that identity, motivation, interest, prior knowledge and experience, and choice and control play in supporting learning and how learning leaders can build on these dimensions of learning in order to successfully engage lifelong learners.
Prerequisites:
with a focus on teaching as the unit of analysis.

Critical analysis of perspectives of research in science/math education

SED 611. SURVEY OF RESEARCH ON TEACHING. (3 Credits)
This course is repeatable for 16 credits.

SED 608. WORKSHOP . (1-16 Credits)
SED 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
SED 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
SED 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 999 credits.
SED 604. RESEARCH. (1-16 Credits)
This course is repeatable for 18 credits.
SED 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 16 credits.

Critical analysis of perspectives of research in science/math education.
Prerequisites: SED 580 with C or better

SED 612. QUANTITATIVE RESEARCH DESIGN AND CRITICAL ANALYSIS. (3 Credits)
A study of quantitative research designs and analytical procedures with specific applications in science or mathematics education.
Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 613. LEARNING THEORY. (3 Credits)
Provides a critical overview and analysis of current theories of learning and development, beginning with a discussion about what learning is, how it has been viewed and studied over time, and how seminal theories inform an understanding of lifelong learning and its facilitation.
Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 615. PRACTICUM IN MATHEMATICS/SCIENCE IN COLLEGE TEACHING. (3 Credits)
Supervised field practicum in college mathematics/science teaching.
This course is repeatable for 9 credits.

SED 621. SURVEY OF RESEARCH ON LEARNING. (3 Credits)
Critical analysis of perspectives on student thinking and learning in science/math education.
Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 622. QUALITATIVE RESEARCH TECHNIQUES. (3 Credits)
A study of qualitative research designs and analytical procedures with specific applications in science and mathematics education.
Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 598. MATHEMATICS AND SCIENCE CURRICULUM. (3 Credits)
Current trends, history of these trends, and rationale for mathematics and science curriculum reform across learning environments.

SED 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

SED 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

Adult and Higher Education Graduate Major (EDD, EDM, PhD)

EdM available only via Ecampus.

The College of Education offers graduate work leading to Master of Education (EdM), Doctor of Education (EdD), and Doctor of Philosophy (PhD) degrees with a major in Adult and Higher Education, as well as Masters of Arts in Interdisciplinary Studies (MAIS).

Master of Education (EdM)
The Masters of Education (EdM) degree in Adult and Higher Education is a program designed for working professionals to enhance their knowledge, skills, and abilities to serve adult learners in a number of settings. These can include for-profit corporations, not-for-profit agencies, community organizations, and various higher education settings. This
Community College Leadership Graduate Option

The EdM degree in Adult and Higher Education is a fully online cohort-based program. It is designed to be completed in two years.

Admission to the EdM Degree

For specific admission information, please go to the AHE website (http://education.oregonstate.edu/how-apply-2/).

The Adult and Higher Education major offers two options: Community College Leadership (CCL) and Leadership in Higher Education (LHE). Candidates will pursue their chosen option either in an EdD or PhD designation, depending upon the purpose and approach of their research study and the intended role to be sought after successful completion of the degree. Both options require completion of courses in foundational and research cores, internship hours, and thesis courses. A minimum of 12 credits of content specialty courses must be taken for each option.

Note: Both options are part-time, cohort-based that meet face-to-face and online (hybrid model), and designed to be completed within a three-to-four-year period.

Doctor of Education (EdD) Degree

The Doctor of Education degree prepares professionals for faculty/administrative leadership roles in a variety of positions in community colleges or other higher education settings. Candidates must have appropriate professional experience that enables them to benefit from the stated program outcomes. Examples of experience include teaching, student services, administration, finance, curriculum specialist, support staff, or supervisor in an educational related setting.

Doctor of Philosophy (PhD) Degree

The Doctor of Philosophy degree prepares professionals for research, administration, and professorial roles in higher education settings. Candidates must have significant experience in an education or education-related setting such as teaching, leadership administration, curriculum specialist, supervisor, etc., where the primary function is education. Knowledge of educational research methodology is highly desirable.

Major Code: 2075

The EdM in Adult and Higher Education Masters degree requires a minimum of 45 quarter credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td>ORGANIZATIONS AND SYSTEMS THEORY</td>
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<td>AHE 547</td>
<td>INSTRUCTIONAL STRATEGIES FOR ADULT LEARNERS</td>
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<td>ETHICAL AND PROFESSIONAL ISSUES</td>
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<td>ADULT LEARNING &amp; DEVELOPMENT</td>
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Additional Requirements

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EdD Requirements

1. Complete a minimum of 114 graduate credits beyond the baccalaureate degree.
2. An earned master’s degree. Up to 36 credits may be credited toward the required graduate credits.
3. At least 24 thesis/dissertation credits.
4. A mentored internship in an appropriate work setting for a minimum of 6 credits.

PhD Requirements

1. Complete a minimum of 120 graduate credits beyond the baccalaureate degree.
2. An earned master’s degree. Up to 33 credits may be credited toward the required graduate credits.
3. A mentored internship in an appropriate work setting for a minimum of 3 credits.
4. At least 36 thesis/dissertation credits.

Major Code: 2075

Community College Leadership Graduate Option

This option is offered within the following major(s):

- Adult and Higher Education - College of Education (p. 361)

An overview of the growing literature related to community colleges, with an emphasis on the role of research in understanding and interpreting the unique nature of community college leadership. The option is committed to developing tomorrow’s leaders based on the principle that leadership can be learned and enhanced. Effective leadership is a combination of commitment, management, and vision related to the role and mission of community colleges. This option is dedicated to developing student competencies in communications, resource management, organizational strategy, collaboration, leadership, and community college advocacy. Ethics and a commitment to social justice are critical foundations that undergird all course work.

This option is designed for the scholar-practitioner wanting to examine through research particular elements of community college organization, learning, and/or leadership.

Option Code: 2076

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<td>ADVANCED RESEARCH METHODS IN EDUCATION</td>
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<td>AHE 506</td>
<td>PROJECTS</td>
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Total Hours 12

Option Code: 2076
Leadership in Higher Education Graduate Option

This option is offered within the following major(s):

- Adult and Higher Education - College of Education (p. 361)

An overview of the extensive literature related to four-year colleges and universities, with an emphasis on the role of research in understanding and interpreting the nature of higher education leadership. The option of leadership in higher education is committed to developing tomorrow's leaders based on the principle that leadership can be learned and enhanced. Effective leadership is a combination of commitment, management, and vision related to the role and mission of higher education institutions. This option is dedicated to developing student competencies in communications, resource management, organizational strategy, collaboration, leadership, and higher education advocacy. Ethics and a commitment to social justice are critical foundations that undergird all course work.

This option is designed for the scholar-practitioner wanting to examine through research particular elements of higher education organization, learning, and/or leadership.

Option Code: 2077

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<td>AHE 673</td>
<td>RESEARCH INTERPRETATION IN FOUR-YEAR HIGHER EDUCATION</td>
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<td>AHE 674</td>
<td>ADVANCED RESEARCH METHODS IN FOUR-YEAR HIGHER EDUCATION</td>
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<td>AHE 675</td>
<td>FOUR-YEAR HIGHER EDUCATION RESEARCH ISSUES</td>
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</table>

Total Hours 12

Option Code: 2077

Adult Education Graduate Minor

The Adult Education graduate minor is offered with focus areas in organization development and training, workforce development, and workplace development.

Minor Code: 2070

A minimum of 15 credits of approved coursework is required.

Minor Code: 2070

Counseling Graduate Major (MCOUN, PhD)

Available only at OSU-Cascades and via Ecampus.

The mission of the Oregon State University graduate program in counseling is to prepare counseling professionals who promote the social, psychological and physical well-being of individuals, families, communities and organizations. We believe that such professional leaders stand for social, economic and political justice and therefore must be prepared to be proactive educators, change agents and advocates in the face of injustice. Counseling professionals are sensitive to life span developmental issues, demonstrate multicultural awareness and recognize a global perspective as integral to the preparation of counselors and counselor educators.

Two graduate degrees are offered in counseling: the Master of Counseling (MCoun) and the Doctor of Philosophy (PhD). The Master of Counseling has two transcript-visible graduate options, Clinical Mental Health Counseling and School Counseling.

OSU's counselor education degree programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The School Counseling graduate option is approved by the Oregon's Teacher Standards and Practices Commission (TSPC).

Major Code: 2970

Master of Counseling Degree (MCoun)

Written Exam Requirement

Graduate Learning Outcomes (GLO): See Learning Outcomes for Master’s Degree Programs (https://gradschool.oregonstate.edu/faculty/program-assessment/).

For students admitted to MCoun program prior to June 2017:

Students admitted to the MCoun degree program prior to June 2017 must successfully pass a written project portfolio that demonstrates mastery GLO(b) of the MCoun learning outcomes. Students will specifically address GLO(a) by describing how they have and/or how they would utilize research/evidence-based counseling practice in their clinical work. Students will address GLO(c) by describing an ethical dilemma they have faced in their clinical practice to date and include an ethical decision model when describing their ethical decision-making processes. The written project portfolio will assess the 8 CACREP areas, in which the MCoun learning outcome objectives are based. These areas include:

1. Human growth and development
2. Social and cultural foundations
3. Helping relationships
4. Group work
5. Career and lifestyle development
6. Appraisal
7. Research and program evaluation - GLO(a)
8. Professional orientation and ethics - GLO(c)

The student’s major advisor and one additional faculty member from the unit will serve as the student’s committee. A student shall receive a Pass when the grading committee unanimously grades the portfolio as a Pass. In cases where consensus is not reached (one member votes Pass and one member votes No Pass) a third faculty member will serve as a third voter. Two outcomes are then possible: the candidate has passed with one dissenting vote or the candidate has not passed (two or more negative votes). In cases where the student has not passed, the committee recommends, by majority vote, that the student's work toward the degree be terminated. The committee recommends, by majority vote, that the student be allowed to resubmit a modified written project portfolio, but not before the end of the term in which the written project portfolio was completed. No more than two modified written project portfolios are permitted.

For students admitted to MCoun program beginning June 2017:
Students admitted to the MCoun degree program beginning June 2017 must successfully pass a nationally administered exam (i.e., Counselor Preparation Comprehensive Examination). The minimum passing score for the national exam is defined as one standard deviation below the national mean at the time of administration. Candidates who do not pass the national exam are allowed to take re-examination, but not before the end of the term in which the exam was administered. No more than two re-exams are permitted.

The written exam will evaluate all three Graduate Learning Outcomes (GLO). Successful completion of the national exam will evidence the candidate’s mastery of MCoun subject material GLO(b) covered in the program, assess the candidate’s ability to apply research GLO(a), and ethical GLO(c) proficiencies on the exam. The exam will assess the 8 CACREP areas, in which the MCoun learning outcomes objectives are based. These areas include:

1. Human growth and development
2. Social and cultural foundations
3. Helping relationships
4. Group work
5. Career and lifestyle development
6. Appraisal
7. Research and program evaluation - GLO(a)
8. Professional orientation and ethics - GLO(c)

**Admission to the Master of Counseling (MCoun) Programs**

The application must be made online via the Graduate School website (http://gradschool.oregonstate.edu/admissions/process/). The minimal prerequisite is a bachelor’s degree. Admission is based on academic background, personal and emotional stability, commitment to diversity, and educational and professional goals. Admission is competitive, by cohort, and begins with the summer session.

Academic performance is not the sole criterion for continuation in clinical courses, such as practicum courses and internships. The university may evaluate an individual’s background to determine the likelihood that the student will maintain standards of professional conduct necessary in the discipline. An evaluation may consider current performance along with past experiences and actions that could affect a student’s ability to perform in the particular course or program.

It should also be noted that individuals who want to become school counselors and do not have a teaching license are eligible to apply for the school counselor option.

The MCoun degree requires a minimum of 49 credits.

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<thead>
<tr>
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<td>COUNSELING PRE-PRACTICUM</td>
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<td>COUN 514</td>
<td>PRACTICUM IN COUNSELING (n.b., taken 2 quarters for 6 credits total)</td>
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<td>COUN 531</td>
<td>DEVELOPMENTAL PERSPECTIVES IN COUNSELING</td>
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<td>COUN 532</td>
<td>SOCIAL AND CULTURAL PERSPECTIVES IN COUNSELING</td>
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<td>COUN 533</td>
<td>ADDICTIVE BEHAVIOR COUNSELING</td>
<td>3</td>
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<tr>
<td>COUN 541</td>
<td>THE COUNSELING PROFESSION</td>
<td>3</td>
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<tr>
<td>COUN 551</td>
<td>THEORY AND TECHNIQUES OF COUNSELING I</td>
<td>3</td>
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<tr>
<td>COUN 552</td>
<td>THEORY AND TECHNIQUES OF COUNSELING II</td>
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<td>COUN 557</td>
<td>APPRAISAL OF THE INDIVIDUAL</td>
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<td>COUN 568</td>
<td>LIFESTYLE AND CAREER DEVELOPMENT</td>
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<td>COUN 571</td>
<td>GROUP COUNSELING PROCEDURES</td>
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<td>COUN 575</td>
<td>FAMILY COUNSELING</td>
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<td>COUN 577</td>
<td>APPLIED PSYCHOPATHOLOGY AND PSYCHODIAGNOSTICS</td>
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<td>COUN 578</td>
<td>CRISIS, TRAUMA, AND GRIEF COUNSELING</td>
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<td>CROSS-CULTURAL COUNSELING</td>
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<td>COUNSELOR CONSULTATION</td>
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<tr>
<td>ED 562</td>
<td>INTRODUCTION TO EDUCATIONAL RESEARCH</td>
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</table>

**Doctor of Philosophy in Counseling**

The PhD degree in Counseling is designed to prepare experienced counseling professionals to extend their roles in the counseling profession. The doctoral program is appropriate for those whose career path is that of research and teaching in counselor preparation programs, in student development at a college or university level, or in supervisory or leadership positions in schools or agencies.

**Requirements for the PhD**

A minimum of 150 credits is required beyond the baccalaureate degree. The program includes thesis, internship, and the balance of credits in specialty areas, including participation in doctoral seminars. Doctoral students can meet the majority of their residency and course requirements in two years of full-time study or three years of part-time study.

**Admission to the PhD Program**

It is expected that individuals entering the PhD program will have completed a master’s degree in counseling that covers the nine areas of concentration required by the Council for Accreditation of Counseling and Related Educational programs (CACREP). The nine areas are human growth and development, social and cultural foundations, helping relationships, groups, career and lifestyle development, appraisal, research and program evaluation, professional orientation, and clinical instruction. Areas not covered in the student’s master’s program or through continuing higher education must be taken in doctoral study.

Applicants are preferred who have a minimum of two years of post-master’s experience as a counselor. Preference will be given to National Certified Counselors (NCCs), state Licensed Professional Counselors (LPCs), those who have graduated with a master’s degree from a CACREP-accredited program, and those who are licensed through a school counseling licensing body, such as Oregon Teacher Standards and Practices. It is also expected that applicants will have participated in counseling as a client prior to admission to the program. Desirable, but not essential, is work in the field of education such as teaching, school administration, curriculum or instruction, and/or educationally related work in child, youth, or adult development programs.

The application must be made online via the Graduate School website (http://gradschool.oregonstate.edu/admissions/process/). A personal interview is a final step in the application process.

Admission is by cohort to begin each summer term.

**Major Code: 2970**

**Clinical Mental Health Counseling Graduate Option**

This option is offered within the following major(s):
Available only at OSU-Cascades and via Ecampus.

The Master of Counseling (MCoun) degree offers a Clinical Mental Health Counseling (CMHC) option for individuals who want to work in community agencies, treatment programs, community colleges and other counseling centers.

This is a 90-credit option offered: 1) on-campus at OSU-Cascades in Bend, or 2) via Ecampus as a hybrid program with online coursework and face-to-face meetings at a convenient Willamette Valley location. OSU-Cascades is a two-three year program and the Ecampus program is a minimum of 3 1/2 years for completion.

Option Code: 2975

Students enrolled in the CMHC option must complete 54 credits of MCoun core courses, 27 credits of specialty courses, and a minimum of 9 credits of CMHC elective courses.

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<td>COUN 536</td>
<td>APPLIED PSYCHOPHARMACOLOGY FOR COUNSELORS</td>
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<td>COUN 550</td>
<td>FOUNDATIONS OF MENTAL HEALTH COUNSELING</td>
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<td>COUN 579</td>
<td>TRAUMA-INFORMED COUNSELING</td>
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<td>or COUN 595</td>
<td>GROUP COUNSELING II</td>
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<td>COUN 597</td>
<td>INTRODUCTION TO COUNSELOR SUPERVISION</td>
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<td>PROJECTS (Up to 0)</td>
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<td>COUN 515</td>
<td>COUNSELING INTERNSHIP (Up to 9)</td>
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Total Hours 36

Option Code: 2975

Counselor Education Graduate Option

This option is offered within the following major(s):

- Counseling - College of Education (p. 363)

Available only via Ecampus (https://ecampus.oregonstate.edu/online-degrees/graduate/education/counseling/).

The Counselor Education option offers a PhD degree in Counseling. It is designed to prepare experienced counseling professionals to extend their roles in the counseling profession. A doctoral degree in Counseling is appropriate for those whose career path is that of research and teaching in counselor preparation programs, in student development at a college or university level, or in supervisory or leadership positions in schools or agencies.

Doctoral students can meet course requirements in two years of part-time study. Writing and defense of the dissertation typically takes two years beyond completing the required course work.

Option Code: 2981

A minimum of 150 credits is required beyond the baccalaureate degree to obtain a PhD in Counselor Education. This option includes 42 credits of core courses and 52 credits of thesis, practicum and internship courses.

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<td>UNIVERSITY LEVEL INSTRUCTIONAL THEORY AND METHODS</td>
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<td>COUN 617</td>
<td>ADVANCED COUNSELOR SUPERVISION</td>
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<td>COUN 662</td>
<td>COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS I</td>
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<td>PUBLICATION METHODS IN COUNSELOR EDUCATION</td>
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<td>COUN 667</td>
<td>ADVANCED CAREER DEVELOPMENT AND CONSULTATION IN COUNSELING</td>
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<td>COUN 619</td>
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Total Hours 94

Option Code: 2981

School Counseling Graduate Option

This option is offered within the following major(s):

- Counseling - College of Education (https://catalog.oregonstate.edu/college-departments/education/counseling-mcoun-phd/)

Available only at OSU-Cascades and via Ecampus.

The Master of Counseling (MCOUN) degree with a School Counseling option is a 75-credit program offered 1) on-campus at OSU-Cascades in Bend, and 2) through an Ecampus 'hybrid' model, online and face-to-face. The OSU-Cascades program offers a two-year full-time or three-year part-time format while the Ecampus program is a three-year part-time format.

The Master of Counseling degree uses a competency-based approach to preparing school counselors. The program prepares the counselor to provide comprehensive school counseling programs that serve all students. Counselors will learn to utilize strategies to work with their students’ academic, personal/social, and career development needs. Preparation consists of a sequential program that integrates academic knowledge and theory with closely supervised counseling practice. Self-exploration and personal development are integral components of the program.

Graduates are eligible for an Oregon School Counselor License upon completion of additional steps required by the Oregon Teacher Standards and Practices Commission.

Option Code: 2980
Counseling Graduate Minor

Option Code: 2980

Minor Code: 2970

Dual Language Education Graduate Certificate

Available only via Ecampus.

This program enables Oregon’s kindergarten through 12th grade (K-12) teachers to effectively educate students in dual language settings. This specialization follows a standards-based curriculum, addressing the six domains specified in Oregon Administrative Rule 584-420-0630:

1. Language
2. Culture
3. Planning, Implementing, and Managing Instruction
4. Assessment
5. Professionalism
6. Community and Family Engagement

In addition to being recognized by state teacher licensing agencies, including Oregon, dual language education is an academic discipline drawing from linguistics, language pedagogy, second language acquisition, multicultural education, education policy, and program administration.

Certificate Code: CG23

Master of Education (EdM) Degree

The EdM program through Ecampus has been suspended effective Summer 2019 (202000).

The Master of Education (EdM) degree advances the knowledge and teaching of PK–12 teachers and other educators who are interested in continued professional development in the field of education in order to create inclusive, supportive learning environments that contribute to student learning and growth. Candidates take courses in educational research, technology, cultural competency, and leadership. They also further their pedagogical content knowledge and instruction in a specific area/option.

Master of Science (MS) Degree

The Master of Science (MS) in Education prepares candidates to be secondary science or mathematics teachers who are skilled professionals drawing upon current educational research to create innovative and inclusive science or math learning environments. Candidates work within a cohort of peers in science and mathematics education and are taught by faculty who specialize in and conduct educational research in science, mathematics, and equity.

Doctor of Philosophy (PhD) Degree

The Doctor of Philosophy (PhD) in Education provides advanced theory and methods in educational research and in specific content areas. This is a research-oriented degree intended for doctoral candidates interested in becoming educational researchers and assume professional positions in a variety of settings, including colleges and universities, non-profit organizations, and government agencies. This degree aims to prepare professional researchers, scholars, or other scholar practitioners. Candidates develop competencies in educational scholarship and research that focus on acquiring new knowledge.

Major Code: 2310

Master of Education (EdM) Degree

The EdM program through Ecampus has been suspended effective Summer 2019 (202000).

The Master of Education degree requires completion of one graduate option for a total of 45 quarter credits. All options require completion of 18 credits of core courses, 12–15 credits of content specialty courses, and 12–15 credits of elective courses from the other EdM options or OSU Colleges. Up to 15 graduate credits may be transferred if they meet OSU Graduate School requirements.

Note: Completion of this degree does not lead to initial (preliminary) teaching licensure; it is an advanced degree for continued professional development in targeted areas.

There are four EdM options, all online and approved by the Oregon Teacher Standards and Practices Commission (TSPC) and nationally accredited by NCATE.

1. Advanced Science and Mathematics Education
2. Free-Choice Learning

Education Graduate Major (EDD, EDM, MS, PhD)

The College of Education offers graduate work leading to the Master of Education (EdM), Master of Science in Education (MS), Doctor of Education (EdD; not available at this time), and Doctor of Philosophy (PhD) degrees with a major in education.
3. PK–12 English to Speakers of Other Languages (ESOL)
4. Social Justice in Education

Applicants to the EdM program must possess teaching experience in a K–12 classroom or in an education-related setting. Because this major is practitioner-based, it requires access to a classroom or informal learning environment to apply educational research, theory, and pedagogical practices, and for completion of a final project.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 506</td>
<td>PROJECTS</td>
<td>3</td>
</tr>
<tr>
<td>ED 522</td>
<td>RACIAL AND CULTURAL HARMONY IN THE K-12 CLASSROOM</td>
<td>3</td>
</tr>
<tr>
<td>ED 542</td>
<td>TEACHER LEADERSHIP OR LEADERSHIP SKILLS FOR CAREER SUCCESS</td>
<td>3</td>
</tr>
<tr>
<td>ED 561</td>
<td>ACTION RESEARCH</td>
<td>3</td>
</tr>
<tr>
<td>ED 562</td>
<td>INTRODUCTION TO EDUCATIONAL RESEARCH</td>
<td>3</td>
</tr>
<tr>
<td>ED 596</td>
<td>TECHNOLOGY FOR EDUCATORS</td>
<td>3</td>
</tr>
<tr>
<td>SED 506</td>
<td>PROJECTS</td>
<td>3</td>
</tr>
<tr>
<td>SED 509</td>
<td>PRACTICUM</td>
<td>3</td>
</tr>
<tr>
<td>SED 510</td>
<td>PROFESSIONAL INTERNSHIP SCIENCE OR MATHEMATICS EDUCATION</td>
<td>15</td>
</tr>
<tr>
<td>SED 511</td>
<td>ANALYSIS OF CLASSROOMS I</td>
<td>3</td>
</tr>
</tbody>
</table>

Content Specialty Courses
Select 12-15 credits

Electives
Select 12-15 credits

Total Hours: 42-48

Master of Science (MS) Degree

The program is comprised of a coherent set of courses that emphasize research-based instruction, educational equity, innovation, and community-partnerships. Candidates work with community partners in public school settings during every term. As part of the program, candidates complete a master’s project that integrates research, theory, and practice.

The program consists of 50 graduate-level credits including 33 credits of core courses, practicum and internship, and 17 credits in a content specialty: Science Education or Mathematics Education. Both options are offered on-campus at OSU in Corvallis.

Upon completion of the program, candidates will have:

• A Master of Science degree in one option:
  • Science Education
  • Mathematics Education
• An Oregon preliminary teaching license; and
• One or more endorsements in Advanced Mathematics, Biology, Chemistry, Integrated Science or Physics.
• It is also possible to earn an ESOL endorsement which includes additional courses and field experiences beyond the required number of credits.

Admission Requirements

• 60 hours of reflective classroom experience. For example,

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 309</td>
<td>FIELD PRACTICUM 1</td>
<td>3-6</td>
</tr>
<tr>
<td>ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE 1</td>
<td>1-16</td>
</tr>
</tbody>
</table>

• A course in technology for teaching mathematics or science. For example,

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 412</td>
<td>TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE 1</td>
<td>3</td>
</tr>
</tbody>
</table>

• A course that addresses the connection between the discipline and the current standards in science and mathematics education. For example,

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 413</td>
<td>INQUIRY IN SCIENCE AND SCIENCE EDUCATION 1</td>
<td>3</td>
</tr>
<tr>
<td>SED 414</td>
<td>INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION 1</td>
<td>3</td>
</tr>
<tr>
<td>SED 416</td>
<td>INQUIRY IN SCIENCE AND MATHEMATICS EDUCATION 1</td>
<td>3</td>
</tr>
</tbody>
</table>

• A course in adolescent psychology. For example,

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 412</td>
<td>LEARNING STYLES AND NEEDS IN ADOLESCENCE 1</td>
<td>2</td>
</tr>
<tr>
<td>ED 440</td>
<td>HUMAN DEVELOPMENT AND PSYCHOLOGY OF THE ADOLESCENT 1</td>
<td>3</td>
</tr>
</tbody>
</table>

• Passing scores on required state licensure tests.

1 These courses may be waived if the candidate has completed similar courses at OSU or other institutions.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 520</td>
<td>CLASSROOM MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>SED 521</td>
<td>FUNDS OF KNOWLEDGE IN EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>SED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>SED 506</td>
<td>PROJECTS</td>
<td>3</td>
</tr>
<tr>
<td>SED 509</td>
<td>PRACTICUM</td>
<td>3</td>
</tr>
<tr>
<td>SED 510</td>
<td>PROFESSIONAL INTERNSHIP SCIENCE OR MATHEMATICS EDUCATION</td>
<td>15</td>
</tr>
<tr>
<td>SED 511</td>
<td>ANALYSIS OF CLASSROOMS I</td>
<td>3</td>
</tr>
</tbody>
</table>

Content Specialty

Select 17 credits

Total Hours: 50

Doctor of Philosophy (PhD) Degree

The Education PhD degree requires at least 108 credits, including a core curriculum (48 credits) in quantitative and qualitative research, practicum, and dissertation/thesis, and 13–18 credits in a specialty area. Additional research methods and elective courses are approved by the major professor.

Candidates select from three PhD options. All options are offered on-campus at OSU in Corvallis:

1. Agricultural Education
2. Language Equity and Educational Policy
3. Science/Mathematics Education

This program is designed for candidates already possessing education beyond the undergraduate level (master’s degree or equivalent). Applicants to the PhD program must have significant experience in an education-related setting such as teaching, leadership administration, curriculum specialist, supervisor, or in a setting where the primary function is education. Some knowledge of educational research methodology is highly desirable.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 580</td>
<td>RESEARCH AND EVALUATION</td>
<td>3</td>
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</table>
Select one of the following: 36

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 603</td>
<td>DISSERTATION</td>
<td>36</td>
</tr>
<tr>
<td>AED 603</td>
<td>DISSERTATION</td>
<td>36</td>
</tr>
<tr>
<td>ED 603</td>
<td>THESIS</td>
<td>3</td>
</tr>
<tr>
<td>SED 612</td>
<td>QUANTITATIVE RESEARCH DESIGN AND CRITICAL ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>SED 615</td>
<td>PRACTICUM IN MATHEMATICS/SCIENCE IN COLLEGE TEACHING</td>
<td>3</td>
</tr>
<tr>
<td>or ED 609</td>
<td>PRACTICUM/CLINICAL EXPERIENCE</td>
<td>3</td>
</tr>
<tr>
<td>SED 622</td>
<td>QUALITATIVE RESEARCH TECHNIQUES</td>
<td>3</td>
</tr>
</tbody>
</table>

**Content Specialty Courses**
Select 13-18 credits

**Electives**
Select two research methods and other approved courses

**Total Hours**
61-66

**Major Code:** 2310

**Advanced Science and Mathematics Education Graduate Option**

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This EdM option aims to prepare PK–12 teachers and educators to specialize in science and mathematics education in public or private schools or informal settings. Courses emphasize using theory to inform classroom practice and practice to inform understanding of educational research in the context of science and math education.

**Option Code:** 2311

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 566</td>
<td>FOSTERING REFLECTIVE DISCOURSE IN SCIENCE AND MATH CONTEXTS</td>
<td>3</td>
</tr>
<tr>
<td>SED 594</td>
<td>ADVANCED INSTRUCTIONAL STRATEGIES IN SCIENCE AND MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>SED 595</td>
<td>ASSESSMENT AND EVALUATION</td>
<td>3</td>
</tr>
<tr>
<td>SED 598</td>
<td>MATHEMATICS AND SCIENCE CURRICULUM</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Select 15 credits of advisor approved courses

**Total Hours**
27

**Option Code:** 2311

**Agricultural Education Graduate Option**

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This option is for the PhD degree.

The Agricultural Education doctoral option has a primary focus of preparing candidates to assume faculty positions in colleges or universities in agricultural education programs. Candidates assemble an individual program of study that provides a comprehensive knowledge of the teaching and learning process with a strong theoretical foundation and practical research experience in agricultural education.

**Option Code:** 2312

**Free-Choice Learning Graduate Option**

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This EdM graduate option prepares educators to support learning in museums, zoos and aquariums, national parks, on the Internet, libraries, afterschool programs and other informal settings and contexts. The program emphasizes the self-directed, voluntary and lifelong nature of learning and courses utilize current learning theory and research to further an understanding of the nature of learning and cultivate better practice.

**Option Code:** 2319

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED 535</td>
<td>COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES</td>
<td>3</td>
</tr>
<tr>
<td>SED 582</td>
<td>PERSONAL DIMENSIONS OF FREE-CHOICE LEARNING</td>
<td>3</td>
</tr>
<tr>
<td>SED 583</td>
<td>SOCIO-CULTURAL DIMENSIONS OF FREE-CHOICE LEARNING</td>
<td>3</td>
</tr>
<tr>
<td>SED 584</td>
<td>PHYSICAL DIMENSIONS OF FREE-CHOICE LEARNING</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Select 15 credits of advisor approved courses

**Total Hours**
27

**Option Code:** 2319

**Language Equity and Educational Policy Graduate Option**

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This option is for the PhD degree.

The Language Equity and Educational Policy (LEEP) PhD option has a primary focus of preparing candidates to assume various positions in post-secondary education, leadership in community education, faculty positions in colleges or universities, or teacher education programs. Working with faculty advisors, candidates create and implement a program of study that provides comprehensive knowledge of research with bi/multilingual communities, equity in education contexts, and educational policies.

**Option Code:** 2313
Option Code: 2313

Mathematics Education Graduate Option

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This option is for the MS degree.

This graduate option is for students wanting to earn both a Master’s of Science degree in Education and qualify for an Oregon teaching license in advanced mathematics.

Option Code: 2314

PK-12 English to Speakers of Other Languages (ESOL) Graduate Option

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This EdM option focuses on how to effectively work with children and adolescents who are learning English as an additional language. It is designed for pre-kindergarten through twelfth grade (PK–12) teachers in the United States. Courses incorporate state and national learning standards for PK–12 students, as well as state and national ESOL standards for PK–12 teacher preparation programs.

Candidates who wish to add the ESOL endorsement to a current Oregon teaching license need to contact the ESOL endorsement program coordinator in the College of Education regarding additional licensure requirements.

Option Code: 2315

Science Education Graduate Option

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This option is for the MS degree.

This option is for students wanting to earn both a Master’s of Science degree in Education and qualify for an Oregon teaching license in one or more of the following endorsements: biology, chemistry, integrated science, physics.

Option Code: 2316

Science/Mathematics Education Graduate Option

This option is offered within the following major(s):

- Education - College of Education (p. 366)

This option is for the PhD degree.

The Science/Mathematics Education PhD option has a primary focus of preparing candidates to assume various positions in collegiate/university, K–12, or free-choice education organizations. Working with faculty advisors, candidates create and implement a program of study that fosters theory-based knowledge and skills and practical research experience necessary for future career ambitions in STEM education.
Social Justice Education Graduate Option

This option is offered within the following major(s):
- Education - College of Education (p. 366)

This option is for the EdM degree.

This EdM option prepares PK–12 teachers and educators in informal settings to be agents of change for equity and social justice. Candidates will learn about social justice curriculum and teaching, will engage in effective collaboration with schools and community, and will become advocates for the educational success of all students.

Option Code: 2318

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 544</td>
<td>TEACHING CRITICAL LITERACY</td>
<td>3</td>
</tr>
<tr>
<td>ED 549</td>
<td>TEACHING IN A DIFFERENTIATED AND DIVERSE CLASSROOM</td>
<td>3</td>
</tr>
<tr>
<td>ED 590</td>
<td>SOCIAL JUSTICE IN EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 599</td>
<td>SPECIAL TOPICS</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives
Select 15 advisor approved credits 15

Total Hours 27

Education Graduate Minor

For more details, see an advisor in the College of Education, 104 Furman Hall, 541-737-4661 or email the advisor at askcoed@oregonstate.edu

Minor Code: 2310

Minor Code: 2310

Education Minor

Also offered via Ecampus.

The Education undergraduate minor is composed of a selection of courses that represent careers and key topics in education-related fields. The minor is open and intended for majors outside of education to obtain an overview of educational careers and concepts. An undergraduate minor in education would be valuable to anyone interested in education and workplace training in their chosen field or in doing outreach education. Some but not all courses in this minor are part of a licensure program. The minor does not result in a teaching or counseling license, but does provide the course work for a Career and Technical Education License in Oregon.

Minor Code: 495

A grade of C– or better is required for all courses used to complete minor requirements. Such courses cannot be taken for an S/U grade.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 216</td>
<td>*PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
<td>3</td>
</tr>
</tbody>
</table>

Education Undergraduate Major (BA, BS, HBA, HBS)

The Education Double Degree (DD) program in the College of Education is an undergraduate pathway to teacher preparation available to all OSU students. The Education DD program enables students to earn two undergraduate degrees concurrently—one in their chosen field and the second in Education (BA or BS degree) including a recommendation to obtain an Oregon teaching license (in a specific content area/endorsement). The BA/BS in Education is a concurrent degree subject to Academic Regulation 26a (p. 16).

Students in the DD must complete two stages. Level I: Pre-Education consists of foundational courses in education which serve as prerequisites for Level II: Professional Education. The pre-requisite courses also meet baccalaureate core requirements and elective credits in students’ first degree. Students must complete all Level I required courses, pass required exams, and meet other entrance requirements before applying to Level II. The Education Double Degree (https://education.oregonstate.edu/program-requirements/) website details program requirements and application information.

The second stage, Level II Professional Level, focuses on teacher preparation courses in Elementary Education or one of many options in Secondary Education (Middle/High School), such as advanced mathematics, biology, chemistry, English language arts, Family &
Consumer Sciences, foundational mathematics, health, integrated science, social studies and physics. Students enter Level II in a cohort to complete pedagogy classes and participate in student teaching.

It is strongly recommended that students meet with the College of Education advisor in Level I: Pre-Education and at least a year prior to their application to Level II: Professional Education.

Contact the Double Degree program advisor for further information: 541-737-4661.

Major Code: 233

Pre-Education Major Code: 232

Education (Double Degree) K–12

Classrooms Pathway

Level I: Pre-Education

These courses must be completed before admission to Level II: Professional Education including courses listed in the option(s) selected in a specific content area.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 216</td>
<td>*PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
<td>3</td>
</tr>
<tr>
<td>ED 219</td>
<td>CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 253</td>
<td>LEARNING ACROSS THE LIFESPAN *</td>
<td>3</td>
</tr>
<tr>
<td>ED 309</td>
<td>FIELD PRACTICUM (May be waived with documented volunteer service in an educational setting)</td>
<td>3</td>
</tr>
<tr>
<td>ED 472</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 15

Content Specific Courses for Subject Area Teaching Content Mastery Sheets (http://education.oregonstate.edu/content-mastery-sheets/) are available on the College of Education website or in the Student Services Office in Furman Hall.

Level II: Professional education

Elementary Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 407</td>
<td>SEMINAR</td>
<td>2</td>
</tr>
<tr>
<td>ED 408</td>
<td>WORKSHOP</td>
<td>2</td>
</tr>
<tr>
<td>ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE</td>
<td>3</td>
</tr>
<tr>
<td>ED 410</td>
<td>INTERNSHIP/WORK EXPERIENCE</td>
<td>3</td>
</tr>
<tr>
<td>ED 412</td>
<td>LEARNING STYLES AND NEEDS IN ADOLESCENCE</td>
<td>2</td>
</tr>
<tr>
<td>ED 425</td>
<td>CURRICULUM IMPLEMENTATION AND INSTRUCTIONAL STRATEGIES 7-12</td>
<td>4</td>
</tr>
<tr>
<td>ED 427</td>
<td>ASSESSMENT FOR K-12 INSTRUCTION</td>
<td>2</td>
</tr>
<tr>
<td>ED 493</td>
<td>READING, LITERATURE, AND LANGUAGE DEVELOPMENT IN THE CONTENT</td>
<td>2</td>
</tr>
<tr>
<td>ED 494</td>
<td>CONTENT STANDARDS AND CURRICULUM DEVELOPMENT FOR HIGH SCHOOL</td>
<td>3-4</td>
</tr>
<tr>
<td>or SED 473</td>
<td>SCIENCE PEDAGOGY AND TECHNOLOGY I</td>
<td></td>
</tr>
<tr>
<td>or SED 474</td>
<td>MATHEMATICS PEDAGOGY AND TECHNOLOGY I</td>
<td></td>
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</tbody>
</table>

Spring Term **

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 410</td>
<td>INTERNSHIP/WORK EXPERIENCE</td>
<td>10</td>
</tr>
<tr>
<td>ED 424</td>
<td>TEACHER AS REFLECTIVE PRACTITIONER</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Hours: 38-39

++ If you have taken HDFS 311, HDFS 313, HDFS 314 and have a 3.0 GPA or higher, you do not need to take ED 253
++ Spring term courses are offered exclusively through Ecampus to accommodate all student teaching placements
* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Major Code: 233

Pre-Education Major Code: 232

Advanced Mathematics Teaching Option

This option is offered within the following major(s):

• Education - College of Education (p. 370)

This option is for students wanting to earn their bachelor’s degree in Education and qualify for an Oregon Teaching License to teach advanced mathematics at the middle school (grades 5 – 9) and high school (grades 9 – 12) levels.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 60

Students must meet every standard for this option by completing all required courses prior to beginning the Professional Level. Note: Most of these classes will also meet requirements for the student’s first degree. Additional option requirements:

• A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted.
• All required courses must be letter graded (A–F); courses graded Pass/No Credit (P/N) or Satisfactory/Unsatisfactory (S/U) are not accepted.

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<tr>
<td>MTH 251</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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</table>

Major Code: 233

Pre-Education Major Code: 232

Advanced Mathematics Teaching Option

This option is offered within the following major(s):

• Education - College of Education (p. 370)

This option is for students wanting to earn their bachelor’s degree in Education and qualify for an Oregon Teaching License to teach advanced mathematics at the middle school (grades 5 – 9) and high school (grades 9 – 12) levels.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 60

Students must meet every standard for this option by completing all required courses prior to beginning the Professional Level. Note: Most of these classes will also meet requirements for the student’s first degree. Additional option requirements:

• A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted.
• All required courses must be letter graded (A–F); courses graded Pass/No Credit (P/N) or Satisfactory/Unsatisfactory (S/U) are not accepted.

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>MTH 251</td>
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<td>INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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</table>
Standard 2. Discrete Mathematics

MTH 355 DISCRETE MATHEMATICS 3

Standard 3. Statistics

ST 351 INTRODUCTION TO STATISTICAL METHODS 4-8
or ST 201 PRINCIPLES OF STATISTICS
& ST 202 and PRINCIPLES OF STATISTICS

Standard 4. Probability

MTH 361 INTRODUCTION TO PROBABILITY 3

Standard 5. Geometry

MTH 338 NON-EUCLIDEAN GEOMETRY 3

Standard 6. Linear Algebra

MTH 341 LINEAR ALGEBRA I 3

Standard 7. Abstract Algebra

MTH 343 INTRODUCTION TO MODERN ALGEBRA 3

Standard 8. Algebraic and Geometric Transformations

MTH 491 ALGEBRA AND GEOMETRIC TRANSFORMATIONS 9

Standard 9. Math Electives

Select a minimum of 6 credits from the following: 6
MTH 253 INFINITE SERIES AND SEQUENCES
MTH 255 VECTOR CALCULUS II
MTH 256 APPLIED DIFFERENTIAL EQUATIONS
MTH 306 MATRIX AND POWER SERIES METHODS

Any ST course

Standard 10. Math Education

SED 414 INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION (secondary section) 3

Total Hours 49-53

* Baccalaureate Core Course
^ Writing Intensive Course (WIC)

Option Code: 60

Biology Teaching Option

This option is offered within the following major(s):

• Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor's degree in Education and qualify for an Oregon Teaching License to teach biology at the high school level (grades 9–12).

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 62

Chemistry Teaching Option

This option is offered within the following major(s):

• Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor's degree in Education and qualify for an Oregon Teaching License to teach chemistry at the high school level (grades 9–12).

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 63
PH 201 *GENERAL PHYSICS
& PH 202  & *GENERAL PHYSICS
& PH 203  & *GENERAL PHYSICS

Series 2
PH 211 *GENERAL PHYSICS WITH CALCULUS
& PH 221  & RECIPIENT FOR PHYSICS 211
PH 212 *GENERAL PHYSICS WITH CALCULUS
& PH 222  & RECIPIENT FOR PHYSICS 212
PH 213 *GENERAL PHYSICS WITH CALCULUS
& PH 223  & RECIPIENT FOR PHYSICS 213

Standard 2. Chemistry Sequence
Select one of the following chemistry series: 12

Series 1
CH 231 GENERAL CHEMISTRY
& CH 261  & *LABORATORY FOR CHEMISTRY 231
CH 232 GENERAL CHEMISTRY
& CH 262  & *LABORATORY FOR CHEMISTRY 232
CH 233 GENERAL CHEMISTRY
& CH 263  & *LABORATORY FOR CHEMISTRY 233

Series 2 (for Chemistry majors)
CH 231 GENERAL CHEMISTRY
& CH 271  & *LABORATORY FOR CHEMISTRY 231 FOR CHEMISTRY MAJORS
CH 232 GENERAL CHEMISTRY
& CH 272  & *LABORATORY FOR CHEMISTRY 232 FOR CHEMISTRY MAJORS
CH 233 GENERAL CHEMISTRY
& CH 273  & *LABORATORY FOR CHEMISTRY 233 FOR CHEMISTRY MAJORS

Standard 3. Analytical Chemistry
CH 324 QUANTITATIVE ANALYSIS 4-6
or CH 421  & ANALYTICAL CHEMISTRY & ANALYTICAL CHEMISTRY

Standard 4. Biochemistry or Physical Chemistry Sequence
Select one of the following biochemistry or physical chemistry series: 9-11

Series 1
BB 450 GENERAL BIOCHEMISTRY
& BB 451  & and GENERAL BIOCHEMISTRY
& CH 324  & and QUANTITATIVE ANALYSIS
or CH 440  & PHYSICAL CHEMISTRY

Series 2
BB 490 BIOCHEMISTRY 1: STRUCTURE AND FUNCTION
& BB 491  & and BIOCHEMISTRY 2: METABOLISM
& BB 492  & and BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY

Series 3
CH 440 PHYSICAL CHEMISTRY
& CH 441  & and PHYSICAL CHEMISTRY
& CH 442  & and PHYSICAL CHEMISTRY

Standard 5. Organic Chemistry Sequence
Select one of the following chemistry series: 9-12

Series 1
CH 331 ORGANIC CHEMISTRY
& CH 332  & and ORGANIC CHEMISTRY
& CH 337  & and ORGANIC CHEMISTRY LABORATORY

Series 2
CH 334 ORGANIC CHEMISTRY
& CH 335  & and ORGANIC CHEMISTRY
& CH 336  & and ORGANIC CHEMISTRY
CH 337  & ORGANIC CHEMISTRY LABORATORY
or CH 361  & EXPERIMENTAL CHEMISTRY I

Standard 6. Science Education
SED 413 INQUIRY IN SCIENCE AND SCIENCE EDUCATION (secondary section) 3

Total Hours 52-59

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 63

Elementary Teaching Option

This option is offered within the following major(s):

• Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor’s degree in Education and qualify for an Oregon Teaching License to teach multiple subjects at the early childhood/elementary (grade PreK-6 in a self-contained classroom) levels.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 58

Completed prior to Professional Level. These requirements are based on the National Board for Professional Teaching Standards/Generalist, Standard II: Knowledge of Content and Curriculum. Most of these courses will also meet requirements for student’s first degree.

Additional option requirements:

• A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted
• All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted

Code Title Hours

Standard 1. English Language Arts
Select a minimum of 6 credits of english: 6
Any ENG Courses
Select a minimum of 6 credits of writing: 6
WR 121 *ENGLISH COMPOSITION
WR 222 *ENGLISH COMPOSITION
Any *WIC Course
Select a minimum of 3 credits in speaking, viewing, listening: 3
COMM 111 *PUBLIC SPEAKING
COMM 218 *INTERPERSONAL COMMUNICATION
Any COMM Course

Standard 2. Social Studies
Select one of the following history courses: 1 4
HST 201 *HISTORY OF THE UNITED STATES
HST 202 *HISTORY OF THE UNITED STATES
HST 203 *HISTORY OF THE UNITED STATES
Select a minimum of 3 credits from the following civics, economics, geography, or political science courses: 3
Any GEO Course
Any GEOG Course
Any PS Course
Any ECON Course
Select one additional course from the following: 3
DHE 270 *APPEARANCE, POWER AND SOCIETY
ENG 220/FILM 220 *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION
ES 351 *ETHNIC MINORITIES IN OREGON
HDFS 201 *CONTEMPORARY FAMILIES IN THE U.S.
PHL 280 *ETHICS OF DIVERSITY
SOC 206 *SOCIAL PROBLEMS AND ISSUES
Family and Consumer Sciences Teaching Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor's degree in Education and qualify for an Oregon Teaching License to teach Family and Consumer Sciences (FACS) at the middle school (grades 6–9) and/or high school (grades 9–12) levels.

Family and Consumer Science students are encouraged to add an optional, but highly recommended, Career and Technical Education (CTE) endorsement. This endorsement can be added during or after the degree program so one can begin working on it at any time. The following CTE endorsements are compatible with Family and Consumer Sciences:

1. Hospitality and Tourism (food, hotel, etc.)
2. Human Services (counseling, personal finance, childcare, care of disabled, personal health and fitness, etc.)
3. Education and Related Fields (preschool, teacher, administration in education-related fields, training and other)

The CTE Endorsement is earned with 1,800 hours working in the industry at one workplace or 600 hours working in a variety of work settings including job shadows, internships, volunteer work, and paid work.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 58

Family and Consumer Sciences Teaching Option

To meet every standard/outcome for this option, students must complete the required courses prior to beginning the Professional Level. Students interested in the FACS option will most likely be earning their first degree in Human Development and Family Sciences, Nutrition (Dietetics or Food Systems Management), Design and Human Environment, or Public Health, thus meeting most of the required FACS course requirements. Note: Most of these courses will also meet the student’s first degree requirements.

Additional option requirements:

- A cumulative 3.0 GPA is preferred on all required course. Grades below C- are not accepted
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted
- Work or volunteer experiences in these standards may be considered in place of course work

Option Code: 65

Family and Consumer Sciences Teaching Option

Total Hours 63

1  History courses need not be taken in sequence
*  Baccalaureate Core Course (BCC)
^  Writing Intensive Course (WIC)
Option Code: 65

Foundational Mathematics Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor’s degree in Education and qualify for an Oregon Teaching License to teach basic mathematics at the middle school (grades 5–9) and only grade 9 in high school.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 59

Students must meet all standards in this option by completing the required courses prior to beginning the Professional Level. Note: Most of these courses will also meet requirements in a student’s first degree.

Additional option requirements:

- A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted

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<th>Hours</th>
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<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
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<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>MTH 211</td>
<td>*FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 212</td>
<td>FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>8</td>
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<tr>
<td>MTH 390</td>
<td>foundATIONS OF ELEMENTARY MATHEMATICS</td>
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<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
<td>4</td>
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<tr>
<td>or ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<tr>
<td>MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
<td>6</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
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<tr>
<td>SED 414</td>
<td>INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION (Elementary or secondary section)</td>
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</table>

Total Hours 33

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)

Option Code: 59

Health Teaching Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor’s degree in Education and qualify for an Oregon Teaching License to teach health at the middle school (grades 6–9) and/or the high school (grades 9–12) levels.

Health students are encouraged to add a Career and Technical Education (CTE) endorsement in Health Sciences. This endorsement qualifies one to teach specialized career training courses at the secondary level. The CTE endorsement is earned with 1,800 hours working in the health industry or 600 working hours in a variety of health industry work settings including job shadows, internships, volunteer work, and paid work. This endorsement can be added during or after the degree program so one can begin working on it at any time.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 66

To meet the standards for this option, students must complete the required courses in every standard prior to beginning the Professional Level. Note: Most of the required courses in this option will also meet a student’s first degree requirements.

Additional option requirements:

- A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted
- Work or volunteer experiences in these standards may be considered in place of course work

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<td>or PSY 330</td>
<td>BRAIN AND BEHAVIOR</td>
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<td>NUTR 225</td>
<td>GENERAL HUMAN NUTRITION</td>
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<td>or NUTR 240</td>
<td>HUMAN NUTRITION</td>
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<tr>
<td>H 225</td>
<td>*SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
<td>4</td>
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<tr>
<td>H 312</td>
<td>*HIV/AIDS AND STIS IN MODERN SOCIETY</td>
<td>3</td>
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<tr>
<td>H 320</td>
<td>INTRODUCTION TO HUMAN DISEASE</td>
<td>3</td>
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<tr>
<td>or H 333</td>
<td>*GLOBAL PUBLIC HEALTH</td>
<td>3-4</td>
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<tr>
<td>GEOG 240</td>
<td>*CLIMATE CHANGE, WATER AND SOCIETY</td>
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<td>GEOG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
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<tr>
<td>GEOG 331</td>
<td>*POPULATION, CONSUMPTION, AND ENVIRONMENT</td>
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<tr>
<td>H 344</td>
<td>*FOUNDATIONS OF ENVIRONMENTAL HEALTH</td>
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<tr>
<td>HDFS 444</td>
<td>FAMILY VIOLENCE AND NEGLECT</td>
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<td>PAC 105</td>
<td>CPR/FIRST AID</td>
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<td>INTRODUCTION TO ADVENTURE PROGRAMS</td>
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<td>KIN 341</td>
<td>NUTRITION FOR EXERCISE</td>
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<td>KIN 370</td>
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<td>PAC 202</td>
<td>MEDITATION</td>
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Integrated Science Teaching Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wishing to earn a bachelor's degree in Education and qualify for an Oregon Teaching License to teach integrated science at the middle school (grades 6–9) and/or high school (grades 9–12) levels.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 66

Integrated Science Teaching Option

Students must meet all standards in this option by completing the required courses prior to beginning the Professional Level. Note: Most of these courses will also meet requirements in a student's first degree. Additional option requirements:

- A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted.
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted.

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<td>PAC 248</td>
<td>SWIM: NON-SWIMMER</td>
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<tr>
<td>PAC 293</td>
<td>INTERDISCIPLINARY YOGA</td>
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<tr>
<td>PAC 302</td>
<td>ALI: CHALLENGE COURSE PRACTICES AND FACILITATION</td>
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<tr>
<td>PAC 304</td>
<td>ALI: BACKPACKING</td>
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<tr>
<td>PAC 320</td>
<td>ALI: MOUNTAINEERING I</td>
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<td>PAC 324</td>
<td>ALI: WHITE WATER RESCUE</td>
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<td>PAC 325</td>
<td>ALI: WILDERNESS FIRST AID</td>
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<td>PAC 329</td>
<td>ALI: WILDERNESS FIRST RESPONDER</td>
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<td>BI 103</td>
<td>*HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE</td>
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<td>HDFS 432</td>
<td>CHILDREN AND YOUTH WITH DISABILITIES</td>
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<td>HDFS 447</td>
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<td>SOC 206</td>
<td>*SOCIAL PROBLEMS AND ISSUES</td>
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<td>*CRIMES AND VIOLENCE IN INTIMATE RELATIONSHIPS</td>
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<td>*GENERAL PHYSICS</td>
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<td>&amp; PH 203</td>
<td>and *GENERAL PHYSICS</td>
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<tr>
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<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td>&amp; PH 221</td>
<td>and RECITATION FOR PHYSICS 211</td>
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<td>PH 212</td>
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<td>&amp; PH 222</td>
<td>and RECITATION FOR PHYSICS 212</td>
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<td>PH 213</td>
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<td>&amp; PH 223</td>
<td>and RECITATION FOR PHYSICS 213</td>
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| Standard 2. Chemistry Sequence
Select one of the following chemistry series: 15

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<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 232</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233</td>
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<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 271</td>
<td>and *LABORATORY FOR CHEMISTRY 231 FOR CHEMISTRY MAJORS</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 272</td>
<td>and *LABORATORY FOR CHEMISTRY 232 FOR CHEMISTRY MAJORS</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 273</td>
<td>and *LABORATORY FOR CHEMISTRY 233 FOR CHEMISTRY MAJORS</td>
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</table>
| Standard 3. Biology Sequence
Select one of the following biology series: 12

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>BI 101</td>
<td>*ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION,</td>
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<tr>
<td>&amp; BI 102</td>
<td>and *GLOBAL CHANGE</td>
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<tr>
<td>&amp; BI 103</td>
<td>and *ANIMAL BIOLOGY: GENES, BEHAVIOR AND</td>
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<tr>
<td>&amp; BI 104</td>
<td>and *HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND</td>
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<tr>
<td>&amp; BI 105</td>
<td>and *DISEASE</td>
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<tr>
<td>Series 2</td>
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<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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</tr>
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<td>&amp; BI 212</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
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</tr>
<tr>
<td>&amp; BI 213</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
<td></td>
</tr>
</tbody>
</table>
| Standard 4. Earth and Space Science
Select a minimum of 15 credits from at least two areas below:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PH 104</td>
<td>*DESCRIPTIVE ASTRONOMY</td>
<td></td>
</tr>
<tr>
<td>PH 205</td>
<td>*SOLAR SYSTEM ASTRONOMY</td>
<td></td>
</tr>
<tr>
<td>PH 206</td>
<td>*STARS AND STELLAR EVOLUTION</td>
<td></td>
</tr>
<tr>
<td>PH 207</td>
<td>*GALAXIES, QUASARS, AND COSMOLOGY</td>
<td></td>
</tr>
<tr>
<td>ATS 201</td>
<td>*CLIMATE SCIENCE</td>
<td></td>
</tr>
<tr>
<td>ATS 310</td>
<td>METEOROLOGY</td>
<td></td>
</tr>
<tr>
<td>GEO 201</td>
<td>*PHYSICAL GEOLOGY</td>
<td></td>
</tr>
<tr>
<td>GEO 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
<td></td>
</tr>
<tr>
<td>GEO 203</td>
<td>*EVOLUTION OF PLANET EARTH</td>
<td></td>
</tr>
<tr>
<td>GEO 204</td>
<td>*ENVIRONMENTAL GEOLOGY</td>
<td></td>
</tr>
<tr>
<td>GEO 205</td>
<td>*LIVING WITH ACTIVE CASCADE VOLCANOES</td>
<td></td>
</tr>
<tr>
<td>GEO 206</td>
<td>*MINERALS, ENERGY, WATER, AND THE ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>GEO 207</td>
<td>*NATIONAL PARK GEOLOGY AND PRESERVATION</td>
<td></td>
</tr>
<tr>
<td>GEO 208</td>
<td>*GLOBAL CHANGE AND EARTH SCIENCES</td>
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<tr>
<td>GEO 352</td>
<td>*OREGON: GEOLOGY, PLACE, AND LIFE ON THE RING OF FIRE</td>
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<tr>
<td>OC 201</td>
<td>*OCEANOGRAPHY</td>
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<tr>
<td>OC 332</td>
<td>COASTAL OCEANOGRAPHY</td>
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</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
Language Arts Teaching Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor’s degree in Education and qualify for an Oregon Teaching License to teach English language arts at the middle school (grades 6–9) and/or high school (grades 9–12) levels.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 68

To be completed prior to beginning the Professional Level. These Standards are based on the National Council of Teachers of English Program Standards for Initial Preparation of Teachers of English Language Arts for Middle and High School Teaching (NCTE [http://www.ncte.org/standards/common-core/]).

Additional option requirements:

- A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted.
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted.

<table>
<thead>
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<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>WR 330</td>
<td>UNDERSTANDING GRAMMAR</td>
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Select one course from each of the following areas:

**Communication**
- Any COMM Course

**Writing**
- Any 200-Level WR Course

**Film**
- FILM 110 *INTRODUCTION TO FILM STUDIES: 1895-1945
- FILM 125 *INTRODUCTION TO FILM STUDIES: 1945-PRESENT
- FILM 220 *TOPICS IN DIFFERENCING, POWER, AND DISCRIMINATION
- FILM 245 *THE NEW AMERICAN CINEMA
- FILM 265 *FILMS FOR THE FUTURE
- FILM 310 *FILM THEORY AND CRITICISM
- FILM 445 DOCUMENTARY FILM STUDIES
- FILM 452 *STUDIES IN FILM

Standard 3. Knowledge and Understanding of the Reading Process

- ENG 345 INTRODUCTION TO LITERARY CRITICISM AND THEORY
- ENG 488 LITERATURE AND PEDAGOGY

Standard 4. Knowledge and Understanding of Different Composing Processes

- WR 411 *THE TEACHING OF WRITING

Any upper-division WR course 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 253</td>
<td>*SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
<td>4</td>
</tr>
<tr>
<td>ENG 254</td>
<td>*SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT</td>
<td>4</td>
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</table>

Shakespeare

Select one course from the following:

- ENG 201 *SHAKESPEARE
- ENG 202 *SHAKESPEARE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ENG 284</td>
<td>*SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660</td>
<td>4</td>
</tr>
<tr>
<td>ENG 205</td>
<td>*SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA</td>
<td>4</td>
</tr>
<tr>
<td>ENG 206</td>
<td>*SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY</td>
<td>4</td>
</tr>
<tr>
<td>ENG 207</td>
<td>*LITERATURE OF WESTERN CIVILIZATION: CLASSICAL-RENAISSANCE</td>
<td>4</td>
</tr>
<tr>
<td>ENG 208</td>
<td>*LITERATURE OF WESTERN CIVILIZATION: 18TH CENTURY TO PRESENT</td>
<td>4</td>
</tr>
<tr>
<td>ENG 210</td>
<td>LITERATURE OF THE WORLD ASIA</td>
<td>4</td>
</tr>
<tr>
<td>ENG 211</td>
<td>LITERATURE OF THE WORLD AFRICA</td>
<td>4</td>
</tr>
<tr>
<td>ENG 212</td>
<td>LITERATURE OF THE WORLD Meso/South America, Caribbean</td>
<td>4</td>
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<tr>
<td>ENG 213</td>
<td>LITERATURE OF THE WORLD MIDDLE EAST</td>
<td>4</td>
</tr>
<tr>
<td>ENG 214</td>
<td>LITERATURE OF THE WORLD EUROPE</td>
<td>4</td>
</tr>
<tr>
<td>ENG 221</td>
<td>AFRO-AMERICAN LITERATURE</td>
<td>4</td>
</tr>
<tr>
<td>ENG 260</td>
<td>LITERATURE OF AMERICAN MINORITIES</td>
<td>4</td>
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</table>

Literature Pre-1800 (1 upper-division ENG course) 4

Literature Post-1800 (2 upper-division ENG courses) 8

Standard 6. Knowledge and Understanding of the Range and Influence of Print and Non-print Media and Technology in Contemporary Culture

Select one course from the following:

- COMM 482 THE MEDIA IN CULTURE AND SOCIETY
- FILM 220 *TOPICS IN DIFFERENCING, POWER, AND DISCRIMINATION
- FILM 255 *WORLD CINEMA PART I: ORIGINS TO 1968
- NMC 101 *INTRODUCTION TO NEW MEDIA COMMUNICATIONS
- NMC 183 INTRODUCTION TO MEDIA PRODUCTION
- NMC 260 NEW MEDIA FUTURES
- WR 414 ADVERTISING AND PUBLIC RELATIONS WRITING
- WR 495 *INTRODUCTION TO LITERACY STUDIES
- WR 497 DIGITAL LITERACY AND CULTURE

Standard 7. Knowledge and Understanding of Research Knowledge, Understanding of Research Theory, and Findings in English Language Arts

- ENG 200 LIBRARY SKILLS FOR LITERARY STUDY 1

Total Hours 59-63

Baccalaureate Core Course (BCC)

Writing Intensive Course (WIC)

Physics Teaching Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor’s degree in Education and qualify for an Oregon Teaching License to teach physics at the high school level (grades 9–12).

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 68

American Literature Sequence

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ENG 253</td>
<td>*SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
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Shakespeare

Select one course from the following:

- ENG 201 *SHAKESPEARE
- ENG 202 *SHAKESPEARE

<table>
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<tbody>
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<td>*SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660</td>
<td>4</td>
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<td>ENG 205</td>
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<td>ENG 210</td>
<td>LITERATURE OF THE WORLD ASIA</td>
<td>4</td>
</tr>
<tr>
<td>ENG 211</td>
<td>LITERATURE OF THE WORLD AFRICA</td>
<td>4</td>
</tr>
<tr>
<td>ENG 212</td>
<td>LITERATURE OF THE WORLD Meso/South America, Caribbean</td>
<td>4</td>
</tr>
<tr>
<td>ENG 213</td>
<td>LITERATURE OF THE WORLD MIDDLE EAST</td>
<td>4</td>
</tr>
<tr>
<td>ENG 214</td>
<td>LITERATURE OF THE WORLD EUROPE</td>
<td>4</td>
</tr>
<tr>
<td>ENG 221</td>
<td>AFRO-AMERICAN LITERATURE</td>
<td>4</td>
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<tr>
<td>ENG 260</td>
<td>LITERATURE OF AMERICAN MINORITIES</td>
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Literature Pre-1800 (1 upper-division ENG course) 4

Literature Post-1800 (2 upper-division ENG courses) 8

Standard 6. Knowledge and Understanding of the Range and Influence of Print and Non-print Media and Technology in Contemporary Culture

Select one course from the following:

- COMM 482 THE MEDIA IN CULTURE AND SOCIETY
- FILM 220 *TOPICS IN DIFFERENCING, POWER, AND DISCRIMINATION
- FILM 255 *WORLD CINEMA PART I: ORIGINS TO 1968
- NMC 101 *INTRODUCTION TO NEW MEDIA COMMUNICATIONS
- NMC 183 INTRODUCTION TO MEDIA PRODUCTION
- NMC 260 NEW MEDIA FUTURES
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- WR 495 *INTRODUCTION TO LITERACY STUDIES
- WR 497 DIGITAL LITERACY AND CULTURE

Standard 7. Knowledge and Understanding of Research Knowledge, Understanding of Research Theory, and Findings in English Language Arts

- ENG 200 LIBRARY SKILLS FOR LITERARY STUDY 1

Total Hours 59-63

Baccalaureate Core Course (BCC)

Writing Intensive Course (WIC)
Option Code: 69

Students must meet all standards in this option by completing the required courses prior to beginning the Professional Level. Note: Most of these courses will also meet requirements in a student's first degree.

Additional option requirements:

- A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted.
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>PH 211 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECUITATION FOR PHYSICS 211</td>
<td>5</td>
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<tr>
<td>PH 212 &amp; PH 222</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECUITATION FOR PHYSICS 212</td>
<td>5</td>
</tr>
<tr>
<td>PH 213 &amp; PH 223</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECUITATION FOR PHYSICS 213</td>
<td>5</td>
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</table>

Standard 2. Chemistry Sequence

<table>
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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
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<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
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<tr>
<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233</td>
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Standard 3. Paradigms in Physics

Select at least 12 credits from the following:

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<tr>
<td>PH 422</td>
<td>PARADIGMS IN PHYSICS: STATIC FIELDS</td>
<td>3</td>
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<tr>
<td>PH 423</td>
<td>PARADIGMS IN PHYSICS: ENERGY AND ENTROPY</td>
<td>3</td>
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<tr>
<td>PH 424</td>
<td>PARADIGMS IN PHYSICS: OSCILLATIONS AND WAVES</td>
<td>3</td>
</tr>
<tr>
<td>PH 425</td>
<td>PARADIGMS IN PHYSICS: QUANTUM FUNDAMENTALS</td>
<td>3</td>
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<tr>
<td>PH 426</td>
<td>PARADIGMS IN PHYSICS: CENTRAL FORCES</td>
<td>3</td>
</tr>
<tr>
<td>PH 427</td>
<td>PARADIGMS IN PHYSICS: PERIODIC SYSTEMS</td>
<td>3</td>
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Standard 4. Modern Physics Electives

Select at least 3 credits from the following:

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<th>Code</th>
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<tr>
<td>PH 315</td>
<td>PHYSICS OF CONTEMPORARY CHALLENGES</td>
<td>3</td>
</tr>
<tr>
<td>PH 335</td>
<td>TECHNIQUES OF THEORETICAL MECHANICS</td>
<td>3</td>
</tr>
<tr>
<td>PH 411</td>
<td>ELECTRONICS</td>
<td>3</td>
</tr>
<tr>
<td>PH 415</td>
<td>COMPUTER INTERFACING AND INSTRUMENTATION</td>
<td>3</td>
</tr>
<tr>
<td>PH 465</td>
<td>COMPUTATIONAL PHYSICS</td>
<td>3</td>
</tr>
<tr>
<td>PH 481</td>
<td>PHYSICAL OPTICS</td>
<td>3</td>
</tr>
<tr>
<td>PH 482/ECE 482</td>
<td>OPTICAL ELECTRONIC SYSTEMS</td>
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<tr>
<td>PH 483/ECE 483</td>
<td>GUIDED WAVE OPTICS</td>
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Standard 5. Science Education

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<tr>
<th>Code</th>
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<tr>
<td>SED 413</td>
<td>INQUIRY IN SCIENCE AND SCIENCE EDUCATION (secondary section)</td>
<td>3</td>
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</table>

Total Hours: 48

* Baccalaureate Core Course (BCC)

Option Code: 69

Social Studies Teaching Option

This option is offered within the following major(s):

- Education - College of Education (p. 370)

This option is for students wanting to earn a bachelor's degree in Education and qualify for an Oregon Teaching License to teach social studies at the middle school (grades 6-9) and/or the high school (grades 9-12) levels.

For more information, contact the College of Education Student Services Advisor, 104 Furman Hall, 541-737-4661.

Option Code: 70

These Standards are based on the National Council for the Social Studies (http://www.socialstudies.org/) (revised 2010). Most of these courses will also meet requirements for student's first degree.

Additional option requirements:

- A cumulative 3.0 GPA is preferred for all required courses. Grades below C- are not accepted.
- All required courses must be letter graded (A–F); courses graded on Pass/No Credits (P/N) or Satisfactory/Unsatisfactory (S/U) basis are not accepted.

You need depth and breadth of knowledge including both analytical and methodological expertise in at least one social studies discipline. Met with a major in one of the following disciplines:

- Anthropology
- Economics
- Ethnic Studies
- Geography
- History
- Liberal Studies
- Political Science
- Psychology
- Sociology

<table>
<thead>
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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>ANTH 210</td>
<td>*COMPARATIVE CULTURES</td>
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<tr>
<td>ANTH 251</td>
<td>*LANGUAGE IN THE USA</td>
<td>3</td>
</tr>
<tr>
<td>HST 104</td>
<td>*WORLD HISTORY I: ANCIENT CIVILIZATIONS</td>
<td>3</td>
</tr>
<tr>
<td>HST 105</td>
<td>*WORLD HISTORY II: MIDDLE AND EARLY MODERN AGES</td>
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<tr>
<td>HST 106</td>
<td>*WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD</td>
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<tr>
<td>WGSS 480</td>
<td>*GENDER AND TRANSNATIONAL ACTIVISMS</td>
<td>3</td>
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</table>

Standard 2: Time, Continuity, and Change

Any ANTH course

Standard 3: People, Places, and Environments

Select one course from the following:

- GEO 203 | *EVOLUTION OF PLANET EARTH | 3 |
- GEOG 105 | *GEOGRAPHY OF THE NON-WESTERN WORLD | 3 |
- GEOG 106 | *GEOGRAPHY OF THE WESTERN WORLD | 3 |
- GEOG 313 | *GEOGRAPHY OF ASIA | 3 |
- GEOG 331 | *POPULATION, CONSUMPTION, AND ENVIRONMENT | 3 |

Standard 4: Individual Development and Identity

Any ES course
Any PSY course
Any WGSS course

Standard 5: Individuals, Groups, and Institutions

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>PS 206</td>
<td>*INTRODUCTION TO POLITICAL THOUGHT</td>
<td>4</td>
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<tr>
<td>PS 365</td>
<td>AMERICAN POLITICAL THOUGHT</td>
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</table>

Standard 6: Power, Authority, and Governance

Select one course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</table>
courses in one area. The program requirement will result in 9 credits that can support future endorsement completion and/or job placement.

Major Code: 923

Pre-Elementary Education Major Code: 924

Program Overview

<table>
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<tr>
<th>Code</th>
<th>Title</th>
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<td>Freshman Skills</td>
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<tr>
<td>Bacc Core</td>
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<td>Supporting</td>
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<td>Electives</td>
<td>33</td>
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<td>4XX/5XX Slash courses</td>
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<td>BA Language requirement</td>
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Program of Study

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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ED 215</td>
<td>*PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
<td>3</td>
</tr>
<tr>
<td>ED 219</td>
<td>CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
<td>3</td>
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<tr>
<td>ED 394</td>
<td>DIFFERENTIATION IN THE ELEMENTARY CLASSROOM</td>
<td>2</td>
</tr>
<tr>
<td>ED 413/ED 513</td>
<td>LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT</td>
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</tr>
<tr>
<td>ED 414/ED 514</td>
<td>LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT</td>
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</tr>
<tr>
<td>ED 450</td>
<td>FOUNDATIONS OF EDUCATION AND PLANNING</td>
<td>4</td>
</tr>
<tr>
<td>ED 451</td>
<td>*ASSESSMENT</td>
<td>4</td>
</tr>
<tr>
<td>ED 452</td>
<td>USING DATA TO SUPPORT ALL STUDENTS</td>
<td>3</td>
</tr>
<tr>
<td>ED 457</td>
<td>TEACHING ELEMENTARY MATHEMATICS FOR UNDERSTANDING</td>
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<tr>
<td>ED 463/ED 563</td>
<td>STRATEGIES FOR TEACHING PHYSICAL EDUCATION HEALTH &amp; WELLNESS</td>
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<tr>
<td>ED 465/ED 565</td>
<td>ELEMENTARY METHODS: LITERACY</td>
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<tr>
<td>ED 466/ED 566</td>
<td>ELEMENTARY METHODS II: MATHEMATICS</td>
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<tr>
<td>ED 467/ED 567</td>
<td>ELEMENTARY METHODS III: NATURAL AND SOCIAL SCIENCE</td>
<td>4</td>
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<tr>
<td>ED 468</td>
<td>ELEMENTARY METHODS IV: LANGUAGE ARTS</td>
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</tr>
<tr>
<td>ED 469/ED 569</td>
<td>STRATEGIES FOR TEACHING THE FINE ARTS</td>
<td>1</td>
</tr>
<tr>
<td>ED 472/ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 492/ED 592</td>
<td>TECHNOLOGY TOOLS FOR TEACHING</td>
<td>2</td>
</tr>
<tr>
<td>Emphasis - Select A, B or C (6 credits)</td>
<td>6</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ED 473/ED 573</td>
<td>INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION</td>
<td></td>
</tr>
<tr>
<td>ED 479/ED 579</td>
<td>LINGUISTICS FOR TEACHERS</td>
<td></td>
</tr>
<tr>
<td>Option B (STEM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED 474/ED 574</td>
<td>PROJECT-BASED MATHEMATICS</td>
<td></td>
</tr>
<tr>
<td>ED 475/ED 575</td>
<td>INTEGRATED STEM</td>
<td></td>
</tr>
<tr>
<td>Option C (Special Education)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED 477/ED 577</td>
<td>DIFFERENTIATION FOR STUDENTS WITH SPECIAL NEEDS</td>
<td></td>
</tr>
<tr>
<td>ED 478/ED 578</td>
<td>SPECIAL EDUCATION LAW RIGHTS AND REGULATIONS</td>
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</table>

Education Practicum and Internship (23 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE (Practicum 1)</td>
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</tr>
<tr>
<td>ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE (Practicum 2)</td>
<td>2</td>
</tr>
</tbody>
</table>

Elementary Education Undergraduate Major (BS, HBS)

Available only at OSU-Cascades.

This program is purposefully and specifically designed to attract and prepare diverse teachers in Central Oregon. Students will select one of three emphasis areas that are considered high need in both Central Oregon and the nation: English as a Second Language; Special Education; or Science, Technology, Engineering, and Mathematics (STEM). Students will complete one course in each of the three emphasis areas as a foundational part of their core coursework and take an additional two...
## Elementary Education Undergraduate Major (BS, HBS)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE (Practicum 3)</td>
<td>2</td>
</tr>
<tr>
<td>ED 410</td>
<td>INTERNSHIP/WORK EXPERIENCE (Internship 1)</td>
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<tr>
<td>ED 410</td>
<td>INTERNSHIP/WORK EXPERIENCE (Internship 2)</td>
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<tr>
<td>ED 410</td>
<td>INTERNSHIP/WORK EXPERIENCE (Internship 3)</td>
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### Support Courses (32 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HDFS 201</td>
<td>*CONTEMPORARY FAMILIES IN THE U.S.</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 311</td>
<td>INFANT AND CHILD DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 431</td>
<td>FAMILY, SCHOOL, AND COMMUNITY COLLABORATION</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 432</td>
<td>CHILDREN AND YOUTH WITH DISABILITIES</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td>4</td>
</tr>
<tr>
<td>MTH 211</td>
<td>*FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 212</td>
<td>FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>4</td>
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<tr>
<td>PSY 201</td>
<td>*GENERAL PSYCHOLOGY</td>
<td>3</td>
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</tbody>
</table>

**Total credits required for graduation:** 180

### Major Code: 923

### Pre-Elementary Education Major Code: 924

#### Course Title Hours

**First Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacc Core Biology with Lab</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ED 219</td>
<td>CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
<td>3</td>
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<tr>
<td>HDFS 201</td>
<td>*CONTEMPORARY FAMILIES IN THE U.S.</td>
<td>3</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>Electives</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td>15</td>
</tr>
</tbody>
</table>

| Winter      |                                                                    |       |
| Bacc Core Cultural Diversity                              | 3     |
| ED 216      | *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY       | 3     |
| HHS 231     | *LIFETIME FITNESS FOR HEALTH                                        | 2     |
| PAC XXX     | Various Physical Activity Courses                                  | 1     |
| WR 222      | *ENGLISH COMPOSITION                                                | 3     |
| or WR 327   | or *TECHNICAL WRITING                                               |       |
| Electives   |                                                                    | 3     |
|             | **Total**                                                           | 15    |

| Spring      |                                                                    |       |
| Bacc Core Literature & Arts                               | 3     |
| COMM 111    | *PUBLIC SPEAKING                                                    | 3     |
| or COMM 218 | or *INTERPERSONAL COMMUNICATION                                    |       |
| PSY 201     | *GENERAL PSYCHOLOGY                                                | 3     |
| Electives   |                                                                    | 6     |
|             | **Total**                                                           | 15    |

**Second Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacc Core Biological or Physical Science with Lab</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>HDFS 311</td>
<td>INFANT AND CHILD DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>MTH 211</td>
<td>*FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
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</tbody>
</table>

| Winter      |                                                                    |       |
| Bacc Core Physical Science with Lab                       | 4     |
| Bacc Core Western Culture (World Civilizations or American History) | 3     |

**Third Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE</td>
<td>2</td>
</tr>
<tr>
<td>ED 463/ED 563</td>
<td>STRATEGIES FOR TEACHING PHYSICAL EDUCATION</td>
<td>1</td>
</tr>
<tr>
<td>ED 469/ED 569</td>
<td>STRATEGIES FOR TEACHING THE FINE ARTS</td>
<td>1</td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>7</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
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</table>

| Winter      |                                                                    |       |
| Professional Elementary Education                          |       |
| ED 394      | DIFFERENTIATION IN THE ELEMENTARY CLASSROOM                        | 2     |
| ED 409      | PRACTICUM/CLINICAL EXPERIENCE                                        | 2     |
| ED 450      | FOUNDATIONS OF EDUCATION AND PLANNING                                | 4     |
| ED 467/ED 567 | ELEMENTARY METHODS III: NATURAL AND SOCIAL SCIENCE                  | 4     |
| ED 492/ED 592 | TECHNOLOGY TOOLS FOR TEACHING                                     | 2     |
|             | **Total**                                                           | 14    |

**Fourth Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission to Teacher Candidacy</td>
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<td></td>
</tr>
<tr>
<td>ED 451</td>
<td>*ASSESSMENT</td>
<td>4</td>
</tr>
<tr>
<td>ED 466/ED 566</td>
<td>ELEMENTARY METHODS II: MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>ED 413/ED 513</td>
<td>LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>ED 410</td>
<td>INTERNSHIP/WORK EXPERIENCE</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
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</table>

| Winter      |                                                                    |       |
| ED 452      | USING DATA TO SUPPORT ALL STUDENTS                                  | 3     |
| ED 472/ED 572 | FOUNDATIONS OF ESOL EDUCATION                                    | 3     |
| ED 468      | ELEMENTARY METHODS IV: LANGUAGE ARTS                              | 4     |
| ED 414/ED 514 | LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT                | 2     |
| ED 410      | INTERNSHIP/WORK EXPERIENCE                                         | 4     |
|             | **Total**                                                           | 16    |

**Spring**

| Select one pair from the following:                      |       |
| ED 477      | DIFFERENTIATION FOR STUDENTS WITH SPECIAL NEEDS                   | 4     |
| & ED 478    | SPECIAL EDUCATION LAW RIGHTS AND REGULATIONS                      |       |
| ED 478      | INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION and LINGUISTICS FOR TEACHERS | 6     |
| & ED 479    | PROJECT-BASED MATHEMATICS                                          |       |
| & ED 475    | and INTEGRATED STEM                                               |       |

**Total** 180 hours
English for Speakers of Other Languages Graduate Certificate

Available only via Ecampus.

This program enables Oregon’s kindergarten through 12th grade (K-12) teachers to effectively educate students who are learning English as an additional language. This specialization follows a standards-based curriculum, addressing the six domains specified in Oregon Administrative Rule 584-420-0360:

1. Language
2. Culture
3. Planning, Implementing, and Managing Instruction
4. Assessment
5. Professionalism
6. Technology

In addition to being recognized by state teacher licensing agencies, including Oregon, ESOL is an academic discipline drawing from linguistics, language pedagogy, second language acquisition, multicultural education, education policy, and program administration.

Certificate Code: CG24

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ED 522</td>
<td>RACIAL AND CULTURAL HARMONY IN THE K-12 CLASSROOM</td>
<td>3</td>
</tr>
<tr>
<td>ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 573</td>
<td>INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 576</td>
<td>PARTNERSHIPS AND IDEOLOGIES IN ESOL EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 579</td>
<td>LINGUISTICS FOR TEACHERS</td>
<td>3</td>
</tr>
<tr>
<td>ED 510</td>
<td>INTERNSHIP</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 18

Certificate Code: CG24

Instructional Design Graduate Certificate

Available only via Ecampus.

The online Instructional Design Certificate provides coursework in the application of educational media and technology skills, developing multimedia materials, instructional design, instructional needs analysis, and computer interface design for learning.

Certificate Code: CG25

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>AHE 522</td>
<td>INSTRUCTIONAL TECHNOLOGY I</td>
<td>1</td>
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<tr>
<td>AHE 523</td>
<td>INSTRUCTIONAL TECHNOLOGY II</td>
<td>1</td>
</tr>
<tr>
<td>AHE 524</td>
<td>INSTRUCTIONAL TECHNOLOGY III</td>
<td>1</td>
</tr>
<tr>
<td>AHE 525</td>
<td>INSTRUCTIONAL TECHNOLOGY IV</td>
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<tr>
<td>AHE 531</td>
<td>INSTRUCTIONAL DESIGN</td>
<td>4</td>
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<tr>
<td>AHE 533</td>
<td>NEEDS ASSESSMENT AND RESEARCH</td>
<td>4</td>
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<tr>
<td>AHE 547</td>
<td>INSTRUCTIONAL STRATEGIES FOR ADULT LEARNERS</td>
<td>4</td>
</tr>
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</table>

Total Hours: 20

Certificate Code: CG25

Mathematics Education Graduate Minor

Graduate Areas of Concentration

Elementary school science, free-choice learning, middle school science, science education, secondary science

Minor Code: 5620

Minor Code: 5620

Science Education Graduate Minor

Graduate Areas of Concentration

Elementary school science, free-choice learning, middle school science, science education, secondary science

Minor Code: 6100

Minor Code: 6100

Teaching Graduate Major (MAT)

Also available at OSU-Cascades and via Ecampus.

Completion of the Teaching program results in a Master of Arts in Teaching (MAT) and recommendation for an Oregon teaching license in a particular subject area or in multiple subjects (elementary).

The Master of Arts in Teaching is an intensive professional degree program intended to prepare teachers for careers in public school education. Students who successfully complete the MAT can be recommended for the Oregon basic teaching license upon the positive evaluations of the university and public school supervisors.

The professional program in teacher education is full-time and one calendar year in length. Students will enroll with their subject area cohort group and complete the program in one year. Teacher licensure is offered in the following areas:

- Advanced Mathematics Education
- Agricultural Education
- Biology Education
- Chemistry Education
- Elementary Education
- Family and Consumer Sciences Education
- Integrated Science Education
- Language Arts Education (English) — Cascades Campus only
- Music Education
- Physics Education
- Spanish Education

Major Code: 2100

The professional teacher education program begins with a 15-credit professional education core that is foundational to and a prerequisite
Clinically Based Elementary Graduate Option

This option is offered within the following major(s):  
• Teaching - College of Education (p. 381)

Available only via Ecampus.

The Clinically Based Elementary option in the Masters of Arts in Teaching (MAT) is a two-year program that features culturally literate education, teaching for social justice, and science and math topics leading to an Oregon preliminary teaching license in multiple subjects (elementary education). This option takes advantage of a partnership between a school district and the College of Education to put teacher candidates in district classrooms. Each term course work includes fully online courses, hybrid courses that are a combination of online and face-to-face learning in local districts, and field practicums in school district classrooms.

Only school districts that have entered into a formal partnership with OSU are available for student placement. Please check with the program lead for a list of participating schools.

Option Code: 2107

Graduate Options

• Clinically Based Elementary (Only via Ecampus)
• Music (offered oncampus at OSU)

The graduate options below are only offered at OSU-Cascades:

• Elementary  
• Language Arts  
• Mathematics  
• Science  
• Social Studies

Major Code: 2100

Clinically Based Elementary Graduate Option

This option is offered within the following major(s):

• Teaching - College of Education (p. 381)

Available only via Ecampus.

The Clinically Based Elementary Graduate Option for the 48-credit Master of Arts in Teaching degree. The 48-credit MAT includes a professional education concentration (3 credits), professional course work in the teaching specialty (18 to 21 credits), a public school professional internship (15 to 18 credits), and a minimum of 9 graduate credits in the subject matter specialization (mathematics, physics, literature, etc.). Because the professional teacher education program is a two-part program, including the professional core and the MAT, future students may plan their programs as either five-year (with a nine-month MAT) or as fifth year programs (with 12 months of graduate study including both the professional core and the MAT).

The MAT degree requires successful completion of a final oral examination.

This program requires a minimum of 45 credits which includes a course in foundations of ESOL instruction and at least 15 credits in internships and/or practicum that provide classroom observation and teaching practice. In addition, a minimum of 3 credits is required in each of the InTASC categories:

• The Learner and Learning,  
• Instructional Practice,  
• Professional Responsibility, and  
• Content Specialty

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
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<td></td>
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<td>3</td>
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</tbody>
</table>

Graduate Options

• Clinically Based Elementary (Only via Ecampus)  
• Music (offered oncampus at OSU)

The graduate options below are only offered at OSU-Cascades:

• Elementary  
• Language Arts  
• Mathematics  
• Science  
• Social Studies

| Code     | Title                                                                 | Hours |
|----------|                                                                      |-------|
| ED 216   | *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY         |       |
| ED 253   | LEARNING ACROSS THE LIFESPAN                                         |       |
| ED 572   | FOUNDATIONS OF ESOL EDUCATION                                         | 3     |
| ED 509   | PRACTICUM                                                              | 6     |
| ED 510   | INTERNSHIP (Student Teaching)                                         | 12    |
| ED 520   | CLASSROOM MANAGEMENT                                                  | 3     |
| ED 548   | STUDENTS WITH SPECIAL NEEDS                                           | 2     |
| ED 597   | K-5 STEM INTEGRATION IN DIVERSE CLASSROOMS                           | 2     |
| ED 528   | ASSESSMENT FOR LEARNING                                                | 3     |
| ED 558   | STRATEGIES FOR TEACHING WELLNESS AND FINE ARTS                       | 2     |
| ED 590   | SOCIAL JUSTICE IN EDUCATION                                           | 3     |
| ED 524   | TEACHER AS REFLECTIVE PRACTITIONAN (Project)                          | 3     |
| ED 559   | STRATEGIES FOR TEACHING HUMANITIES                                    | 3     |
| ED 582   | STRATEGIES FOR DEVELOPING LITERACY                                    | 3     |
| SED 552  | MATHEMATICS METHODS: PRACTICUM I                                      | 3     |
| SED 553  | SCIENCE METHODS/PRACTICUM I                                           | 3     |
|          | Total Hours                                                             | 51    |

* Baccalaureate Core Course (BCC)

Option Code: 2107

Elementary Graduate Option

This option is offered within the following major(s):

• Teaching - College of Education (p. 381)

Available only at OSU-Cascades.

The Elementary graduate option is for students wanting to earn both a Master of Arts in Teaching (MAT) degree in elementary education and qualify for an Oregon teaching license to teach multiple subjects in a self-contained classroom.

Option Code: 2101

| Code     | Title                                                                 | Hours |
|----------|                                                                      |-------|
| ED 572   | FOUNDATIONS OF ESOL EDUCATION                                         | 3     |
| ED 513   | LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT                  | 3     |
| ED 514   | LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT                    | 2     |
| ED 515   | LEARNING ENVIRONMENTS III: CULTURES AND COMMUNITIES                  | 2     |
Language Arts Graduate Option

This option is offered within the following major(s):
- Teaching - College of Education (p. 381)

Available only at OSU-Cascades.

The Language Arts graduate option is for students wanting to earn both a Master of Arts in Teaching (MAT) degree in language arts and qualify for an Oregon teaching license in language arts.

Option Code: 2102

Mathematics Graduate Option

This option is offered within the following major(s):
- Teaching - College of Education (p. 381)

Available only at OSU-Cascades.

The Mathematics graduate option is for students wanting to earn both a Master of Arts in Teaching (MAT) degree in mathematics and qualify for an Oregon teaching license in mathematics.

Option Code: 2103

Music Graduate Option

This option is offered within the following major(s):
- Teaching - College of Education (p. 381)

The Music graduate option is an intensive, one-year graduate program for students wanting to earn both a Master of Arts in Teaching (MAT) degree in music and qualify for an Oregon teaching license in music.

Option Code: 2104
### Science Graduate Option

**Option Code:** 2104

**Science Graduate Option**

This option is offered within the following major(s):

- Teaching - College of Education (p. 381)

Available only at OSU-Cascades.

The Science graduate option is for students wanting to earn both a Master of Arts in Teaching (MAT) degree in science and qualify for an Oregon teaching license in one of the following areas: biology, chemistry, integrated science, physics.

**Option Code:** 2105

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>ED 513</td>
<td>LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>ED 514</td>
<td>LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT</td>
<td>2</td>
</tr>
<tr>
<td>ED 515</td>
<td>LEARNING ENVIRONMENTS III: CULTURES AND COMMUNITIES</td>
<td>2</td>
</tr>
<tr>
<td>ED 594</td>
<td>DIFFERENTIATION</td>
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<tr>
<td>ED 595</td>
<td>EDUCATIONAL DEVELOPMENT</td>
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<tr>
<td>ED 550</td>
<td>THE EFFECTIVE TEACHING CYCLE I: FOUNDATIONS AND PLANNING</td>
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<tr>
<td>ED 551</td>
<td>THE EFFECTIVE TEACHING CYCLE II: ASSESSMENT</td>
<td>4</td>
</tr>
<tr>
<td>ED 592</td>
<td>TECHNOLOGY TOOLS FOR TEACHING</td>
<td>2</td>
</tr>
<tr>
<td>ED 518</td>
<td>PROFESSIONAL PRACTICE IN THE TEACHING COMMUNITY</td>
<td>2</td>
</tr>
<tr>
<td>ED 519</td>
<td>CAPSTONE: TEACHING AS A PROFESSION</td>
<td>3</td>
</tr>
<tr>
<td>ED 531</td>
<td>SCIENCE METHODS I: INQUIRY AND THE NATURE OF SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>ED 532</td>
<td>SCIENCE METHODS II: SUPPORTING STUDENTS’ CONCEPTUAL CHANGE</td>
<td>4</td>
</tr>
<tr>
<td>ED 533</td>
<td>SCIENCE METHODS III: SCIENCE FOR ALL LEARNERS</td>
<td>4</td>
</tr>
<tr>
<td>ED 510</td>
<td>INTERNSHIP</td>
<td>17</td>
</tr>
</tbody>
</table>

Total Hours 48-50

### Social Studies Graduate Option

**Option Code:** 2105

**Social Studies Graduate Option**

This option is offered within the following major(s):

- Teaching - College of Education (p. 381)

Available only at OSU-Cascades.

The Social Studies graduate option is for students wanting to earn both a Master of Arts in Teaching (MAT) degree in social studies and qualify for an Oregon teaching license in social studies.

**Option Code:** 2106

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
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<tr>
<td>ED 513</td>
<td>LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>ED 514</td>
<td>LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT</td>
<td>2</td>
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<tr>
<td>ED 515</td>
<td>LEARNING ENVIRONMENTS III: CULTURES AND COMMUNITIES</td>
<td>2</td>
</tr>
<tr>
<td>ED 594</td>
<td>DIFFERENTIATION</td>
<td>2</td>
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<tr>
<td>ED 595</td>
<td>EDUCATIONAL DEVELOPMENT</td>
<td>2</td>
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<tr>
<td>ED 550</td>
<td>THE EFFECTIVE TEACHING CYCLE I: FOUNDATIONS AND PLANNING</td>
<td>4</td>
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<tr>
<td>ED 551</td>
<td>THE EFFECTIVE TEACHING CYCLE II: ASSESSMENT</td>
<td>4</td>
</tr>
<tr>
<td>ED 592</td>
<td>TECHNOLOGY TOOLS FOR TEACHING</td>
<td>2</td>
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<tr>
<td>ED 518</td>
<td>PROFESSIONAL PRACTICE IN THE TEACHING COMMUNITY</td>
<td>2</td>
</tr>
<tr>
<td>ED 519</td>
<td>CAPSTONE: TEACHING AS A PROFESSION</td>
<td>3</td>
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<tr>
<td>ED 587</td>
<td>SOCIAL STUDIES METHODS I: ADOLESCENT LITERACY</td>
<td>4</td>
</tr>
<tr>
<td>ED 588</td>
<td>SOCIAL STUDIES METHODS II: STRATEGIES FOR GRADES 5-12</td>
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<tr>
<td>ED 589</td>
<td>SOCIAL STUDIES METHODS III: CURRICULUM AND THE PROFESSION</td>
<td>4</td>
</tr>
<tr>
<td>ED 510</td>
<td>INTERNSHIP</td>
<td>17</td>
</tr>
</tbody>
</table>

Total Hours 58

### College of Engineering

101 Covell Hall
Oregon State University
Corvallis, OR 97331-2411
The College of Engineering (CoE)

Founded in 1889, our college endeavors to create solutions that promote strong economies, healthy people, and a sustainable natural environment. Our program has a long history of graduating world-class engineers who have made major impacts on civilization through significant contributions in science and technology. Alumni achievements include breakthrough innovations such as the first artificial heart valve, the computer mouse, and the concept of email.

By emphasizing authentic, experiential engineering experiences within our curriculum, we equip students with the knowledge, skills, and passion to advance innovative solutions to today’s most complex engineering challenges. Through nearly 30 unique degree programs at the graduate and undergraduate level, we produce top-notch engineers who are grounded in integrity, ingenuity, and a keen understanding of the interrelatedness of global economics, cultures, and natural systems. Our faculty collaborates across disciplines to leverage synergies in teaching, research, and innovation. And we cultivate strategic partnerships to turn research results into new companies and products that create jobs while helping people to lead better lives.

The College of Engineering offers degrees in engineering, computer science, construction engineering management, energy systems engineering, and radiation health physics. Students may choose engineering majors from biological, chemical, civil, ecological, electrical and computer, environmental, industrial, manufacturing, mechanical, and nuclear engineering. Educational preparation for land surveying, a licensed profession in all states, is offered through civil engineering. Forest engineering is offered by the College of Forestry.

The Engineering Profession

Engineering is the profession in which knowledge of the mathematical and natural sciences gained through education and practice is applied with judgment to develop ways to economically utilize the materials and forces of nature for the benefit of humankind. It is a licensed profession in all of the states of the USA, and educational programs must meet high professional standards. Engineers are not only responsible for planning, designing, manufacturing, construction, and management, but also for the safety and welfare of the public that relies on their work.

Mission and Goals

The college’s undergraduate educational mission is to provide high-quality engineering programs that prepare students for successful careers, lifelong learning, and service to their profession and society. OSU engineering graduates will be known for their technical competence and creativity; for their ability to apply, adapt, and extend their knowledge to solve a wide variety of problems; and for their effective communication skills. Their education will provide them with an understanding of the ways in which the humanities, social sciences, basic sciences, and technology interact to affect society. These programs will foster an environment that stimulates learning and promotes diversity.

The college’s undergraduate programs have four goals:

1. Educate students thoroughly in mathematics, basic science and engineering sciences relevant to their discipline’s professional work, including fundamental concepts, experimental techniques, methods of analysis, and computational applications.
2. Develop the ability of students to communicate effectively and to work collaboratively in diverse team environments.
3. Develop in students an awareness of the historical evolution of knowledge and technical applications, the state of current professional practice, their need for lifelong learning, contemporary issues, and the impact of engineering actions and solutions in a societal and global context; and to develop an understanding of their professional and ethical responsibilities.
4. Develop the ability of students to formulate and solve problems, to integrate and synthesize knowledge, and to think creatively, leading to the capability to analyze and design components, processes, or systems; plan and carry out experiments effectively; and troubleshoot and modify processes and systems.

Preparing for an Engineering Career

To prepare for the practice of engineering, students complete an accredited program of study leading to a bachelor of science degree in an established engineering field. Most engineering curricula require 180 credits; exceptions include programs in chemical, ecological, environmental, and bioengineering. All programs include a balance of course work in mathematics, science, liberal arts, engineering science, and engineering design.

Upon graduation, engineering students are eligible to take the Fundamentals of Engineering Examination of the State Board of Engineering Examiners in any state. After passing the examination and completing four years of progressively responsible engineering work, graduates are eligible to take the professional engineering license examination of the state in which they intend to practice.
Although some fields of industrial and government employment do not require formal professional licensure, the educational preparation for the bachelor's degree is a necessity for virtually all such employment.

Preparation for the professional practice of land surveying follows a pattern of education, experience, examination, and professional licensure similar to that required for professional engineering practice.

Students completing the BS in Radiation Health Physics degree will be eligible to take part I of the Certified Health Physics (CHP) Examination of the American Board of Health Physics after one year of applied health physics practice. After six years of responsible professional experience in health physics, graduates will be eligible to take part II of the CHP examination.

Choosing a Major

The selection of a major is often difficult for students who have not had close association with engineering activities. Students should not be overly concerned with this problem as the first year curriculum is largely similar for all majors. This flexibility allows students to change majors during the first year without loss of progress. Engineering students are encouraged to register for General Engineering unless they are absolutely certain about their chosen major.

The College also offers a number of interdisciplinary programs. More information about these programs can be found on the Other Degrees & Programs (p. 395) webpage.

Graduate Study

Because of the growing complexity of modern engineering practice, graduate study is important for those students who wish to specialize. Students who have established satisfactory undergraduate records and who are looking for the greatest opportunity in their professional field should consider continuation of their education beyond the baccalaureate degree. Study for the Master of Science (MS) and Master of Engineering (MEng) degrees normally requires one or two years. The Doctor of Philosophy (PhD) degree requires three to four additional years.

Accreditation

The Bachelor of Science degrees in Bioengineering, Chemical, Civil, Ecological, Electrical and Computer, Energy Systems, Environmental, Industrial, Manufacturing, Mechanical, and Nuclear Engineering baccalaureate programs are accredited by the Engineering Accreditation Commission of the ABET, Inc. 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; 410-347-7700. The Construction Engineering Management program is accredited by the American Council for Construction Education. The Bachelor of Science degree in Computer Science-Computer Systems option is accredited by the Computing Accreditation Commission of the ABET, Inc. 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; 410-347-7700. The Bachelor of Science degree in Radiation Health Physics is accredited by the Applied Science Accreditation Commission of the ABET, Inc. 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; 410-347-7700.

Admission Requirements

Admission to the college requires that students meet general university admission requirements, as published in the OSU Academic Catalog. Students are assigned to the department or school of their choice after their first year for advising and program planning. Information on policies and programs is available from the College of Engineering.

Forest Engineering

See College of Forestry. Also see College of Forestry for information on the Forest Engineering-Civil Engineering (p. 549) program.

General Engineering

The first year of the General Engineering curriculum meets the requirements of all engineering curricula except bioengineering, chemical engineering, environmental engineering, and ecological engineering, which require a different chemistry sequence. To meet requirements for bioengineering, chemical engineering, environmental engineering, and ecological engineering, CH 201 and CH 202 may be substituted for CH 231/CH 261, CH 232/CH 262, and CH 233/CH 263. Students who have not decided upon a major prior to enrolling are encouraged to register for General Engineering.

Curriculum

The General Engineering curriculum below will prepare students to enter many of the engineering programs. Students may transfer into any program at any time during the first year; they must transfer by the end of the year.

General Engineering (One-year Program, Major Code: 827)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>6</td>
</tr>
<tr>
<td>&amp; CH 202</td>
<td>and CHEMISTRY FOR ENGINEERING MAJORS</td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>ENGR 111</td>
<td>ENGINEERING ORIENTATION I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 112</td>
<td>INTRODUCTION TO ENGINEERING COMPUTING</td>
<td>3</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>Biological science elective 1</td>
<td></td>
<td>4</td>
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<tr>
<td>Perspectives 1</td>
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<td>9</td>
</tr>
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</table>

Total Hours 50-51

* Baccalaureate Core Course
1 Must be selected to satisfy the requirements of the baccalaureate core

College of Engineering Grading and GPA Requirements

All technical, writing and communications courses must be taken for letter grades (A through F): C or better grades are passing.

Satisfactory Academic Progress for Engineering Students

A student in good academic standing satisfies university, college, and program academic requirements. The university may change a student's status to warning, probation, or suspension following guidelines contained in the Schedule of Classes. The College of Engineering has a similar, but independent, process.
At the conclusion of each term, term and cumulative GPA are calculated and academic standings are determined for students according to the criteria outlined below. Students whose standings evidence a lack of satisfactory progress will be warned of this condition and advised to seek help from their academic advisors. Students who fail to improve may be removed from the college.

1. **COE Warning:** Students with either an OSU term GPA below 2.5 or an OSU term completion percentage below 65% will be placed on College of Engineering Warning. Students must meet with their academic program advisor before they can register for subsequent terms.

2. **COE Probation:** Students who are on College of Engineering Warning, and have attempted 24 or more credits at OSU, and either have an OSU cumulative GPA below 2.5 or an OSU cumulative completion percentage below 65%, will be placed on College of Engineering Probation. Students must meet with their program advisor and complete an Academic Success Agreement before they can register for subsequent terms. To get off COE Probation, the student will need to meet the terms of the academic success agreement.

3. **COE Suspension:** Students who are on College of Engineering Probation and have a subsequent term of OSU term GPA below 2.5, or have a subsequent OSU term completion percentage below 65% will be suspended from the College of Engineering (removed from their major), and unable to take major restricted courses in the College.

4. **Reinstatement to the College:** Suspended students may be reinstated to the program after one year, or completion of a minimum of 24 quarter credits of acceptable transferable college-level work at an accredited college or university, with a GPA of 2.5 or above. **These 24 credits must be pre-approved in writing by the program head advisor.** Students reinstated to the program who are subsequently suspended may only apply for reinstatement under the ‘one year’ option.

Reinstatement requests from students will be considered by the College Committee on Reinstatement (CCR) made up of three College of Engineering school advisors and college head advisor (or their designee). Reinstatement guidelines are available electronically in the College of Engineering Undergraduate Policy Manual (http://engineering.oregonstate.edu/undergraduate-policy-manual/).

**Graduation Requirements**

To graduate with a baccalaureate degree in any of the engineering or computer science majors, a student must complete 180 credits; exceptions include programs in chemical, environmental, ecological, and bioengineering, which require 192 credits. In addition, students must have a minimum 2.5 institutional GPA and minimum 2.5 GPA in all required and elective classes in their chosen major. A student must also meet all university degree requirements published each year in the Academic Regulations (p. 16).

**Academic Dishonesty Policy**

Students that violate the academic honesty policy a second time will be suspended from the College of Engineering for a period of one year.

**Biological and Ecological Engineering**

The Department of Biological and Ecological Engineering at OSU is involved in teaching, research and extended education relevant to the application of engineering analysis to biological, ecological and hydrological systems. The department has strength in graduate training and research and offers both an MS and PhD degree in Biological and Ecological Engineering. The graduate degree program is focused on the professional development of engineers and the analysis of environmental systems, hydrology and water resources. Activities within the department include water resource analysis, fate and transport of biologically relevant chemicals, bioreactor design and analysis, watershed analysis and resource management, simulation modeling of ecological and biological systems, regional and global hydrology, geographical information systems for environmental modeling, and the development of bio-based products and fuels.

**Undergraduate Programs**

**Major**
- Ecological Engineering (p. 392)

**Minor**
- Irrigation Engineering (p. 395)

**Graduate Programs**

**Major**
- Biological and Ecological Engineering (p. 390)

**Minor**
- Biological and Ecological Engineering (p. 391)

**Facility**

**Professors** Bolte, Godwin, Liu, Murthy, Selker, Tullos
**Associate Professors** Bachelet, Chaplen, Ely, Higgins
**Assistant Professors** Good, Jones, Udell, Vache

1. Licensed Professional Engineer.

**BEE 101. ECOLOGICAL ENGINEERING I. (3 Credits)**

Introduction to engineering at OSU and the field of ecological engineering. Topics include engineering analysis and problem solving, professional ethics, the design process and teamwork. **Recommended:** MTH 112

**BEE 102. ECOLOGICAL ENGINEERING II. (3 Credits)**

Introduction to common problems and solutions in ecological engineering, emphasizing the multiplicity of approaches to constraining, analyzing, and resolving challenges of ecosystem management. Two overnight field trips to local ecological monitoring and engineering sites will be required.

**BEE 199. SPECIAL TOPICS. (1-16 Credits)**

This course is repeatable for 16 credits.
BEE 221. FUNDAMENTALS OF ECOLOGICAL ENGINEERING. (3 Credits)
Introduction to the concepts and practice of ecological engineering including characteristics, classification, and modeling of ecosystems; ecosystem protection; and sustainable uses of ecosystems, including treatment wetlands, land treatment systems, and ecologically sensitive stormwater management, to meet the needs of human societies.
Prerequisites: (BI 211 with C or better or BI 211H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: BEE 321

BEE 222. ECOLOGICAL ENGINEERING COMPUTATION. (3 Credits)
Programming methods relevant to ecological engineering, including hardware/software integration.

BEE 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BEE 311. ECOLOGICAL FLUID MECHANICS. (4 Credits)
Fluid properties, fluid statics, fluid motion, conservation of mass, momentum and energy for incompressible fluids, dimensional analysis, ecological engineering applications. Lec/rec.
Prerequisites: (PH 212 with C or better or PH 212H with C or better) and (MTH 254 [C] or MTH 254H [C]) and (ENGR 211 [C] or ENGR 211H [C])

BEE 312. ECOHYDRAULICS. (4 Credits)
Theory and design of hydraulic systems for ecological engineering applications. Lec/rec.
Prerequisites: BEE 311 with C or better or CE 311 with C or better or CHE 331 with C or better or CHE 331H with C or better

BEE 313. ECOHYDROLOGY. (4 Credits)
Provides quantitative description of fundamental hydrologic processes and the hydrologic cycle, the interactions of water between atmosphere, soils, and plants, and models for estimating the generation and transport of water in the environment. Lec/rec.
Prerequisites: BEE 312 with C or better

BEE 320. BIOSYSTEMS ANALYSIS AND MODELING. (4 Credits)
An introduction to simulation modeling and analysis of a variety of biological and ecological systems. Systems approaches to describing ecological systems.
Prerequisites: BEE 222 with C or better and (MTH 256 [C] or MTH 256H [C])
Recommended: MTH 256

BEE 322. ECOLOGICAL ENGINEERING THERMODYNAMICS AND TRANSFER PROCESS. (4 Credits)
A study of the transport processes of fluid flow, heat transfer and mass transfer applied to biological organisms and ecological systems.
Prerequisites: BEE 320 with C or better

BEE 361. ECOLOGICAL ENGINEERING LABORATORY. (3 Credits)
Introduction to modern measurement methods for ecological and environmental applications includes sensors and systems for measuring soil, water and atmospheric properties. No final exam; field trip required. Lec/lab.
Prerequisites: BEE 312 with C or better

BEE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

BEE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BEE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BRE 405
This course is repeatable for 16 credits.

BEE 407. SEMINAR. (1-16 Credits)
Departmental seminars. Graded P/N.
Equivalent to: BEE 407H, BRE 407
This course is repeatable for 16 credits.

BEE 407H. SEMINAR. (1-16 Credits)
Departmental seminars. Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BEE 407
This course is repeatable for 16 credits.

BEE 410. ECOLOGICAL ENGINEERING INTERNSHIP. (1-12 Credits)
Internship in ecological engineering to provide students with an opportunity to apply course work and theory to the real world. Requires internship opportunity identification by student.
This course is repeatable for 12 credits.

BEE 411. GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS. (3 Credits)
Empowers students interested in global change research to focus on the interactions between changes in human land use and climate. Using an innovative online data and mapping tool called Data Basin, students will explore topics accessing the highest quality datasets available in an all-in-one platform.
Prerequisites: FE 257 with C or better

BEE 415. PROFESSIONAL DEVELOPMENT. (1 Credit)
Preparation for student professional careers. Students will interact with and hear seminars from professionals working in the ecological engineering field to learn from their experiences.
Corequisites: BEE 469

BEE 433. IRRIGATION SYSTEM DESIGN. (4 Credits)
Principles of soil physics and plant water use applied to irrigation system design. Design of gravity, pressurized, and trickle irrigation systems, improving on-farm water management, performance characteristics of pumps and other irrigation equipment. Lec/lab. Offered alternate years.
Prerequisites: BEE 312 with C or better or CE 313 with C or better
Equivalent to: BRE 433

BEE 438. ECOLOGICAL SYSTEMS ANALYSIS. (4 Credits)
An introduction to sustainability with a focus on case studies that are relevant to biological and ecological engineers. An introduction to tools that perform technical feasibility analysis, economic viability analysis, environmental risk assessment, resource sustainability assessment and life cycle assessment (LCA). Course will consist of theory and case studies highlighting the use of LCA methods to assess sustainability.
Prerequisites: ENGR 391 with C or better or ENGR 391H with C or better

BEE 439. IRRIGATION PRINCIPLES AND PRACTICES. (4 Credits)
Survey of irrigation systems, system configurations, factors that influence irrigation efficiency, crop water requirements, energy requirements, pumps, irrigation scheduling. For non-engineers. Lec/lab/rec.
Prerequisites: MTH 111 with C or better
Equivalent to: BRE 439

BEE 446. RIVER ENGINEERING. (4 Credits)
Multipurpose river use; natural physical processes in alluvial rivers; channel modification practices; river structures; design practices; impact of river modification; problem analysis; and impact minimization. Offered alternate years.
Prerequisites: BEE 312 with C or better or CE 313 with C or better
Recommended: CE 313
BEE 458. NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL. (3 Credits)
Problem solving in nonpoint source pollution. Methods for evaluating the extent, rate, timing, and fate of Non-Point Source (NPS) pollutants in agricultural and urban environments.
Prerequisites: BEE 313 with C or better or CE 412 with C or better

BEE 468. BIOREMEDIATION ENGINEERING. (4 Credits)
Examines strategies for using a variety of biological processes for treating municipal, agricultural and industrial contaminants. Lec/lab.
Prerequisites: BEE 221 with C or better or ENVE 322 with C or better

BEE 469. ECOLOGICAL ENGINEERING DESIGN I. (4 Credits)
Engineering design processes for ecological engineering applications, including specifications, performance criteria, timelines, and project logistics, principles and practices of working in engineering teams. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: BEE 322 with C or better
Recommended: ENGR 391 or ENGR 391H

BEE 470. ECOLOGICAL ENGINEERING DESIGN II. (4 Credits)
Engineering design processes for ecological engineering applications, including specifications, performance criteria, timelines, and project logistics, principles and practices of working in engineering teams.
Prerequisites: BEE 469 with C or better

BEE 472. INTRODUCTION TO FOOD ENGINEERING PRINCIPLES. (5 Credits)
Fundamental engineering principles for scientists and non-process engineers. Topics include fluid flow, mass and energy transfer, and material and energy balances. Directed at food scientists and other majors who need or would like a working knowledge of food engineering principles.
Prerequisites: MTH 112 with C- or better and (MTH 227 [C-] or MTH 251 [C] or MTH 251H [C-]) and PH 201 [C-]
Equivalent to: BEE 452

BEE 473. INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN. (3 Credits)
Fundamental engineering process design principles for food scientists and non-process engineers. Directed at those who need or would like a working knowledge of applied food engineering process design. Lec/rec.
Equivalent to: BEE 453
Recommended: BEE 472 or BEE 572

BEE 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BEE 499H, BRE 499
This course is repeatable for 16 credits.

BEE 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BEE 499
This course is repeatable for 16 credits.

BEE 501. RESEARCH. (1-16 Credits)
Equivalent to: BRE 501
This course is repeatable for 16 credits.

BEE 503. THESIS. (1-16 Credits)
Equivalent to: BRE 503
This course is repeatable for 999 credits.

BEE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BRE 505
This course is repeatable for 16 credits.

BEE 506. PROJECTS. (1-16 Credits)
Equivalent to: BRE 506
This course is repeatable for 16 credits.

BEE 507. SEMINAR. (1 Credit)
Section 1: Graduate Student Orientation Seminar to acquaint new graduate students with graduate school and departmental requirements, policies and expectations, and departmental research programs.
Section 2: Graduate Research Publication Seminar to expose students to requirements for successful proposals and publication of research results. Section 3: Oral Presentation Improvement—A highly participatory educational effort designed to improve performance in presenting research reports, technical papers and in responding to oral examination questions. Graded P/N.
Equivalent to: BRE 507
This course is repeatable for 99 credits.

BEE 511. GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS. (3 Credits)
Empowers students interested in global change research to focus on the interactions between changes in human land use and climate. Using an innovative online data and mapping tool called Data Basin, students will explore topics accessing the highest quality datasets available in an all-in-one platform.

BEE 512. PHYSICAL HYDROLOGY. (3 Credits)
Principles of hydrologic processes and the integration of these processes into the hydrologic cycle. Topics include atmospheric processes, precipitation and runoff, storm response in streamflow on a watershed scale, and major concepts in groundwater systems.
Equivalent to: BRE 512
Recommended: One year of calculus.

BEE 522. DATA ANALYSIS AND VISUALIZATION USING PYTHON. (3 Credits)
Foundation course in computational thinking and computational skills relevant to data analysis and visualization of environmental data.

BEE 525. STOCHASTIC HYDROLOGY. (3 Credits)
Introduction to fundamental concepts that are needed for stochastic modeling of hydrologic processes in presence of nonstationarity and uncertainty. CROSSLISTED as BEE 525/CE 525.
Prerequisites: CE 512 with C or better or BEE 512 with C or better
Equivalent to: CE 525

BEE 529. BIOSYS MODELING TECHNIQUES. (3 Credits)
Development of mathematical models of biological and ecological systems; linear and nonlinear systems analysis; stochastic modeling and random processes; model solution and analysis techniques.

BEE 533. IRRIGATION SYSTEM DESIGN. (4 Credits)
Development of mathematical models of biological and ecological systems; linear and nonlinear systems analysis; stochastic modeling and random processes; model solution and analysis techniques.

BEE 553. IRIGATION SYSTEM DESIGN. (4 Credits)
Principles of soil and plant water use applied to irrigation system design. Design of gravity, pressurized, and trickle irrigation systems, improving on-farm water management, performance characteristics of pumps and other irrigation equipment. Lec/lab. Offered alternate years.
Equivalent to: BEE 533
Recommended: ENGR 332

BEE 558. ECOLOGICAL SYSTEMS ANALYSIS. (4 Credits)
An introduction to sustainability with a focus on case studies that are relevant to biological and ecological engineers. An introduction to tools that perform technical feasibility analysis, economic viability analysis, environmental risk assessment, resource sustainability assessment and life cycle assessment (LCA). Course will consist of theory and case studies highlighting the use of LCA methods to assess sustainability.
Recommended: ENGR 391 or ENGR391H
BEE 540. ENVIRONMENTAL TRANSPORT PROCESSES. (3 Credits)
Mixing and transport processes in the environment.

BEE 542. VADOSE ZONE TRANSPORT. (4 Credits)
Introduction to the physical and hydraulic properties involved in flow from the soil surface to groundwater. Classical infiltration equations will be derived and presented with exact and approximate solutions. Attention is focused on application to pollutant transport and recent advances in non-ideal flow.
Equivalent to: BRE 542
Recommended: MTH 254

BEE 544. OPEN CHANNEL HYDRAULICS. (4 Credits)
Steady, uniform, and nonuniform flow in natural and artificial open channels; unsteady flow; interaction of flow with river structures; and computational methods. Offered alternate years.
Equivalent to: BRE 544, CE 544
Recommended: CE 313

BEE 545. SEDIMENT TRANSPORT. (4 Credits)
Principles of sediment erosion, transportation and deposition in rivers, reservoirs, and estuaries; measurement, analysis, and computational techniques. Offered even years in winter term. CROSSLISTED as BEE 545/FE 545.
Equivalent to: BRE 545, FE 545
Recommended: CE 313 or FE 330

BEE 546. RIVER ENGINEERING. (4 Credits)
Multipurpose river use; natural physical processes in alluvial rivers; channel modification practices; river structures; design practices; impact of river modification; problem analysis; and impact minimization. Offered alternate years.
Equivalent to: CE 546
Recommended: CE 313

BEE 549. REGIONAL HYDROLOGIC MODELING. (3 Credits)
Challenges in regional-scale water resource analysis and management with emphasis on application to production agriculture. Application of geostatistical techniques to spatially variable systems and remote sensing to large-scale water resource systems. Development of soil-water-atmosphere-plant models. Analysis of evapotranspiration estimating methods. Offered alternate years.
Equivalent to: BRE 549
Recommended: BEE 512 and MTH 256

BEE 555. NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL. (3 Credits)
Problem solving in nonpoint source pollution. Methods for evaluating the extent, rate, timing, and fate of Non-Point Source (NPS) pollutants in agricultural and urban environments.

BEE 568. BIOREMEDIATION ENGINEERING. (4 Credits)
Examines strategies for using a variety of biological processes for treating municipal, agricultural and industrial contaminants. Lec/lab.

BEE 572. INTRODUCTION TO FOOD ENGINEERING PRINCIPLES. (5 Credits)
Fundamental engineering principles for scientists and non-process engineers. Topics include fluid flow, mass and energy transfer, and material and energy balances. Directed at food scientists and other majors who need or would like a working knowledge of process engineering principles.
Recommended: MTH 112 and (MTH 227 or MTH 251 or MTH 251H) and PH 201

BEE 573. INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN. (3 Credits)
Fundamental engineering process design principles for food scientists and non-process engineers. Directed at those who need or would like a working knowledge of applied food engineering process design. Lec/rec.
Equivalent to: BEE 553
Recommended: BEE 472 or BEE 572

BEE 585. METABOLIC SYSTEMS ENGINEERING. (3 Credits)
Quantitative and experimental approaches for describing and engineering biological networks and an introduction to the principles and methodologies of metabolic engineering and synthetic biology.
Equivalent to: BIOE 585
Recommended: Statistics, biology, biochemistry or microbiology.

BEE 586. PROBLEM SOLVING FOR METABOLIC SYSTEMS ENGINEERING. (1 Credit)
Corequisites: BEE 585
Equivalent to: BEE 585
Recommended: MTH 251 and MTH 252

BEE 599. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BRE 599
This course is repeatable for 16 credits.

BEE 601. RESEARCH. (1-16 Credits)
Equivalent to: BRE 601
This course is repeatable for 16 credits.

BEE 603. THESIS. (1-16 Credits)
Equivalent to: BRE 603
This course is repeatable for 999 credits.

BEE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BRE 605
This course is repeatable for 16 credits.

BEE 606. PROJECTS. (1-16 Credits)
Equivalent to: BRE 606
This course is repeatable for 16 credits.

BEE 607. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: BRE 607
This course is repeatable for 16 credits.

BEE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Biological and Ecological Engineering Graduate Major (MENG, MS, PhD)

Graduate Areas of Concentration

Bio-based products and fuels, bioprocessing, biological systems analysis, ecosystems analysis and modeling, water quality, water resources

The Department of Biological and Ecological Engineering offers graduate programs leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees.

The Biological and Ecological Engineering program serves at the interface of life sciences and engineering. Bioresource engineering is the application of engineering and life science principles and problem-solving techniques to the optimum use and sustainability of biological
The curriculum is engineering-based with a strong emphasis on the life sciences. Courses focus on biological systems modeling, bioprocess engineering, thermophysical and molecular properties of biological materials, regional hydrologic analysis, groundwater systems, irrigation and water resource optimization. The department concentrates its research effort on two major thrusts: bioprocess engineering and water resources engineering. Specific research topics include biosensors, molecular-level biosystems analysis, nanosensors, microbial fuel cells, biological hydrogen production, and bio-based products and fuels. Research topics in water resources engineering include constructed wetland treatment systems, crop growth modeling, optimum irrigation management, crop-water requirements, groundwater and subsurface contaminant transport, hydrologic modeling, agricultural and ecological systems analysis, geographical information systems, artificial intelligence technologies, livestock production odor control, livestock waste treatment, and non-point source water pollution control.

For more information contact: Biological and Ecological Engineering Graduate Program, info-bee@oregonstate.edu, 541-737-2041.

**Major Code: 4500**

**MEng**

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**Prerequisite and Requisite Coursework for all BEE graduate degrees**

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<td>MTH 252 INTEGRAL CALCULUS</td>
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<td>MTH 254 VECTOR CALCULUS I ¹</td>
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<td>MTH 256</td>
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<td>PH 212 *GENERAL PHYSICS WITH CALCULUS</td>
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<td>PH 213 *GENERAL PHYSICS WITH CALCULUS</td>
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<td>CH 202 CHEMISTRY FOR ENGINEERING MAJORS</td>
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¹ MTH 254 can be substituted with MTH 306

**Major Code: 4500**

**Biological and Ecological Engineering Graduate Minor**

The Biological and Ecological Engineering program serves at the interface of life sciences and engineering. Bioresource engineering is the application of engineering and life science principles and problem-solving techniques to the optimum use and sustainability of biological resources. The curriculum is engineering-based with a strong emphasis on the life sciences. Courses focus on biological systems modeling, bioprocess engineering, thermophysical and molecular properties of biological materials, regional hydrologic analysis, groundwater systems, irrigation and water resource optimization. The department concentrates its research effort on two major thrusts: bioprocess engineering and water resources engineering. Specific research topics include biosensors, molecular-level biosystems analysis, nanosensors, microbial fuel cells, biological hydrogen production, and bio-based products and fuels. Research topics in water resources engineering include constructed wetland treatment systems, crop growth modeling, optimum irrigation management, crop-water requirements, groundwater and subsurface contaminant transport, hydrologic modeling, agricultural and ecological systems analysis, geographical information systems, artificial intelligence technologies, livestock production odor control, livestock waste treatment, and non-point source water pollution control.

For more information contact: Biological and Ecological Engineering Graduate Program, info-bee@oregonstate.edu, 541-737-2041.

**Minor Code: 4500**

A graduate minor must be in an academic area that clearly supports the major. On a MS or PhD program, a minor may be:
Ecological Engineering Undergraduate Major (BS, HBS)

Ecological engineering (EcoE) is the design of sustainable systems consistent with ecological principles that integrate human activities into the natural environment to the benefit of both. Our systems approach to engineering emphasizes diversity, resilience, and adaptation to maintain sustainability. Ecological engineering deals with both fundamental processes and engineering applications on scales that range from microscopic to watersheds and beyond. This discipline is rapidly developing as an important new area of engineering based on the science of ecological systems, with a number of dedicated journals, national and international professional societies, and new application areas emerging over the last decade. The Biological and Ecological Engineering Department at OSU has considerable expertise in this area and is among the national leaders in this discipline.

The Bachelor of Science and Honors Bachelor of Science degrees in Ecological Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org. The EcoE program is the first of its kind nationally, reflecting Oregon's leadership in this new and exciting multidisciplinary field. The curriculum is divided into an ecological engineering core and a set of upper-division science and engineering electives. The ecological engineering core contains the introductory and upper-division course work that provides the common engineering and scientific basis for our students. The core consists of pre-professional courses, baccalaureate core requirements, required upper-division engineering courses, and required science courses. Selections are made to a total of 23 credits of engineering and science/public policy electives. This organization provides students with considerable flexibility in selecting their degree path.

Graduates with an Ecological Engineering degree will work to optimize the interface between humankind and the environment. Example activities undertaken might include river and wetland restoration, optimizing sensor arrays for ecological monitoring, improving productivity at agricultural and aquaculture facilities, managing the quality and quantity of water leaving farms, urban areas, landfills and industrial sites, and projection and adaptation of natural and anthropogenic systems to global climate and land use changes.
<table>
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<td>FE 257</td>
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<td>IE 380</td>
<td>*THE RESPONSIBLE ENGINEER</td>
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<td>or PHIL 205</td>
<td>*ETHICS</td>
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<td>*Difference, Power, and Discrimination</td>
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<td>*Literature and the Arts</td>
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<td>*Western Culture</td>
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<td>*Social Policies and Institutions</td>
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<td>*Synthesis—Science, Technology, and Society</td>
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<td>*Synthesis—Contemporary Global Issues</td>
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<td>BEE 446</td>
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<td>COASTAL INFRASTRUCTURE</td>
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<td>FOR 441</td>
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<td>FOR 450</td>
<td>*FOREST POLICY</td>
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<td>FOR 462</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
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<td>FST 210</td>
<td>FRUIT AND VEGETABLE PROCESSING</td>
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<td>FST 212</td>
<td>DAIRY PROCESSING</td>
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<td>FST 213</td>
<td>DAIRY PROCESSING LABORATORY</td>
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<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
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<tr>
<td>FST 460</td>
<td>BREWING SCIENCE</td>
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<tr>
<td>FST 461</td>
<td>BREWING ANALYSIS</td>
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<td>FST 466</td>
<td>WINE PRODUCTION PRINCIPLES</td>
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<td>FST 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
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<td>FST 490</td>
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<td>FW 251</td>
<td>PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
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<td>FW 326</td>
<td>INTEGRATED WATERSHED MANAGEMENT</td>
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<tr>
<td>FW 350</td>
<td>*ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY</td>
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<tr>
<td>FW 435</td>
<td>*WILDLIFE IN AGRICULTURAL ECOSYSTEMS</td>
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<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
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<tr>
<td>FW 462</td>
<td>Ecosystem Services</td>
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<tr>
<td>FW 470</td>
<td>Wetlands and Riparian Ecology</td>
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<tr>
<td>GEO 202</td>
<td>*Earth Systems Science</td>
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<td>GEO 322</td>
<td>Surface Processes</td>
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<td>GEO 432</td>
<td>Applied Geomorphology</td>
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<td>GEO 481</td>
<td>Glacial Geology</td>
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<td>GEO 487</td>
<td>Hydrogeology</td>
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<tr>
<td>GEOG 201</td>
<td>*Foundations of Geospatial Science and GIS</td>
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<td>GEOG 370</td>
<td>Geovisualization: Cartography</td>
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<td>GEOG 423</td>
<td>Snow Hydrology</td>
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<tr>
<td>GEOG 480</td>
<td>Remote Sensing I: Principles and Applications</td>
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<tr>
<td>HORT 285</td>
<td>Permaculture Design and Theory: Certificate Course</td>
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<tr>
<td>HORT 300</td>
<td>Crop Production in Pacific Northwest Agroecosystems</td>
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<td>or CROP 300</td>
<td>Crop Production in Pacific Northwest Agroecosystems</td>
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<td>HORT 318</td>
<td>*Applied Ecology of Managed Ecosystems</td>
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<td>HORT 360</td>
<td>Irrigation and Drainage</td>
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<td>HORT 414</td>
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<td>or CROP 414</td>
<td>Precision Agriculture</td>
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<td>MB 303</td>
<td>General Microbiology Laboratory</td>
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<td>MTH 351</td>
<td>Introduction to Numerical Analysis</td>
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<tr>
<td>MTH 432</td>
<td>Numerical Solution of Ordinary Differential Equations</td>
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<td>MTH 436</td>
<td>Applied Ordinary Differential Equations</td>
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<td>MTH 482</td>
<td>Applied Partial Differential Equations</td>
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<tr>
<td>OC 434</td>
<td>Estuarine Ecology</td>
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<tr>
<td>or FW 434</td>
<td>Estuarine Ecology</td>
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<tr>
<td>RGE 341</td>
<td>Rangeland Ecology and Management</td>
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<td>RGE 351</td>
<td>Range Ecology I: Grasslands</td>
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<td>RGE 352</td>
<td>Range Ecology II: Shrublands</td>
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<td>RGE 421</td>
<td>Wildland Restoration and Ecology</td>
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<td>RGE 455</td>
<td>Riparian Ecodynamics and Management</td>
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<td>SOIL 455</td>
<td>Biology of Soil Ecosystems</td>
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<tr>
<td>ST 421</td>
<td>Introduction to Mathematical Statistics</td>
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<tr>
<td>&amp; ST 422</td>
<td>and Introduction to Mathematical Statistics</td>
<td></td>
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<tr>
<td>SUS 304</td>
<td>*Sustainability Assessment</td>
<td></td>
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<tr>
<td>SUS 350</td>
<td>*Sustainable Communities</td>
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<tr>
<td>TOX 430</td>
<td>Chemical Behavior in the Environment</td>
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<tr>
<td>WSE 455</td>
<td>Industrial Marketing in the Forest Sector</td>
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<tr>
<td>Z 349</td>
<td>*Biodiversity Causes, Consequences, and Conservation</td>
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</table>

**Total credits required for graduation:** 192

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

1 For major transfers only, B grade or better, must have completed CH 12X sequence prior to transfer

**Major Code: 450**

**First Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BEE 101</td>
<td>Ecological Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>CH 231</td>
<td>General Chemistry</td>
<td>5</td>
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<tr>
<td>&amp; CH 261</td>
<td>and *Laboratory for Chemistry 231</td>
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<tr>
<td>MTH 251</td>
<td>*Differential Calculus</td>
<td>4</td>
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<tr>
<td>WR 121</td>
<td>*English Composition</td>
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<td>Hours</td>
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**Winter**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CH 232</td>
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<tr>
<td>&amp; CH 262</td>
<td>and *Laboratory for Chemistry 232</td>
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<tr>
<td>COMM 111</td>
<td>*Public Speaking</td>
<td>3</td>
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<tr>
<td>or COMM 114</td>
<td>&quot;Argument and Critical Discourse&quot;</td>
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<tr>
<td>HHS 231</td>
<td>*Lifetime Fitness for Health</td>
<td>3</td>
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<td>&amp; HHS 241</td>
<td>and *Lifetime Fitness (or any PAC course)</td>
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<tr>
<td>MTH 252</td>
<td>Integral Calculus</td>
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<td>Hours</td>
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**Spring**

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<tbody>
<tr>
<td>BEE 102</td>
<td>Ecological Engineering II</td>
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<tr>
<td>CH 233</td>
<td>General Chemistry</td>
<td>5</td>
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<tr>
<td>&amp; CH 263</td>
<td>and *Laboratory for Chemistry 233</td>
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<tr>
<td>MTH 254</td>
<td>Vector Calculus I</td>
<td>4</td>
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<td>PH 211</td>
<td>*General Physics with Calculus</td>
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**Second Year**

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<tbody>
<tr>
<td>BI 211</td>
<td>*Principles of Biology</td>
<td>4</td>
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<tr>
<td>MTH 256</td>
<td>Applied Differential Equations</td>
<td>4</td>
</tr>
<tr>
<td>PH 212</td>
<td>*General Physics with Calculus</td>
<td>4</td>
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<tr>
<td>SOIL 205</td>
<td>Soil Science</td>
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<tr>
<td>&amp; SOIL 206</td>
<td>and *Soil Science Laboratory for Soil 205</td>
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<td>Hours</td>
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**Winter**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BEE 221</td>
<td>Fundamentals of Ecological Engineering</td>
<td>3</td>
</tr>
<tr>
<td>BI 212</td>
<td>*Principles of Biology</td>
<td>4</td>
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<tr>
<td>ENGR 211</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>PH 213</td>
<td>*General Physics with Calculus</td>
<td>4</td>
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<td>ST 314</td>
<td>Introduction to Statistics for Engineers</td>
<td>3</td>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BEE 222</td>
<td>Ecological Engineering Computation</td>
<td>3</td>
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<tr>
<td>BI 213</td>
<td>*Principles of Biology</td>
<td>4</td>
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<tr>
<td>ENGR 213</td>
<td>Strength of Materials</td>
<td>3</td>
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<tr>
<td>MTH 306</td>
<td>Matrix and Power Series Methods</td>
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<td>WR 327</td>
<td>*Technical Writing</td>
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**Third Year**

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<tr>
<td>AEC 250</td>
<td>*Introduction to Environmental Economics and Policy</td>
<td>3</td>
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<tr>
<td>BEE 311</td>
<td>Ecological Fluid Mechanics</td>
<td>4</td>
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<tr>
<td>BEE 320</td>
<td>Biosystems Analysis and Modeling</td>
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<tr>
<td>BI 370</td>
<td>Ecology</td>
<td>3</td>
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**Winter**

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<tr>
<th>Course Code</th>
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<tr>
<td>BEE 312</td>
<td>Ecohydrology</td>
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<tr>
<td>BEE 322</td>
<td>Ecological Engineering Thermodynamics and Transfer Process</td>
<td>4</td>
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<tr>
<td>FE 257</td>
<td>GIS and Forest Engineering Applications</td>
<td>3</td>
</tr>
<tr>
<td>IE 380</td>
<td>*The Responsible Engineer</td>
<td>3</td>
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<tr>
<td>Engineering Elective I</td>
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<td>3-4</td>
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**Spring**

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<tr>
<td>BEE 313</td>
<td>Ecohydrology</td>
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<tr>
<td>BEE 361</td>
<td>Ecological Engineering Laboratory</td>
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<tr>
<td>ENGR 391</td>
<td>Engineering Economics and Project Management</td>
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</table>
**Irrigation Engineering Minor**

The Irrigation Engineering minor is available to any undergraduate student accepted into the Ecological Engineering, Environmental Engineering, or Civil Engineering professional engineering programs. It exposes engineering students to agricultural, biological, and engineering sciences needed to specialize in agricultural and food-related industries.

**Minor Code: 304**

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<tr>
<th>Code</th>
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<tr>
<td>BEE 311</td>
<td>ECOLOGICAL FLUID MECHANICS</td>
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<td>FLUID MECHANICS</td>
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<tr>
<td>BEE 312</td>
<td>ECOHYDRAULICS</td>
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<td>BEE 313</td>
<td>ECOHYDROLOGY</td>
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<tr>
<td>BEE 433</td>
<td>IRRIGATION SYSTEM DESIGN</td>
<td>4</td>
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<td>BEE 458</td>
<td>NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL</td>
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<th>Electives</th>
<th>Select 8 credits from the following:</th>
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<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY ^</td>
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<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
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<tr>
<td>CE 417</td>
<td>HYDRAULIC ENGINEERING DESIGN</td>
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<tr>
<td>MB 230</td>
<td>*INTRODUCTORY MICROBIOLOGY</td>
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<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
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<tr>
<td>&amp; SOIL 206</td>
<td>and *SOIL SCIENCE LABORATORY FOR SOIL 206 ^</td>
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</table>

* Baccalaureate Core Course (BCC)

^ For non-Ecological Engineering BS Majors only

**Other Degrees & Programs within the College of Engineering**

**Undergraduate Programs**

**Minors**
- Humanitarian Engineering (p. 398)
- International Engineering (p. 399)

**Engineering Science**

**ENGR 003. UNDERGRADUATE RESEARCH. (0 Credits)**
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

**ENGR 101. DESIGN OF COFFEE. (2 Credits)**
Roast coffee beans and brew and taste coffee while using engineering design to create the perfect cup of coffee using the least amount of electricity. Lec/rec.

**ENGR 111. ENGINEERING ORIENTATION I. (3 Credits)**
Engineering as a profession, historical development, ethics, curricula and engineering careers. Introduction to problem analysis and solution, data collection, accuracy and variability. Lec/rec.

**Equivalent to:** ENGR 111H

**ENGR 112. INTRODUCTION TO ENGINEERING COMPUTING. (3 Credits)**
Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software. Lec/lab/rec.

**Equivalent to:** ENGR 112H, ENGR 112H

**ENGR 112H. INTRODUCTION TO ENGINEERING COMPUTING. (3 Credits)**
Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software. Lec/lab/rec.

**Attributes:** HNRS – Honors Course Designator

**Equivalent to:** ENGR 112

**ENGR 199. SPECIAL TOPICS. (0-16 Credits)**
Graded P/N.

**Equivalent to:** ENGR 199H

*This course is repeatable for 16 credits.*

**ENGR 201. ELECTRICAL FUNDAMENTALS I. (3 Credits)**

**Prerequisites:** (MTH 251 with C or better or MTH 251H with C or better) and (MTH 252 [C] or MTH 252H [C])

**Equivalent to:** ENGR 201H

**ENGR 201H. ELECTRICAL FUNDAMENTALS I. (3 Credits)**

**Attributes:** HNRS – Honors Course Designator

**Prerequisites:** (MTH 251 with C or better or MTH 251H with C or better) and (MTH 252 [C] or MTH 252H [C])

**Equivalent to:** ENGR 201
ENGR 202. ELECTRICAL FUNDAMENTALS II. (3 Credits)
Sinusoidal steady-state analysis and phasors. Application of circuit analysis to solve single-phase and three-phase circuits including power, mutual inductance, transformers and passive filters. Lec/lab.
Prerequisites: ENGR 201 with C or better or ENGR 201H with C or better
Equivalent to: ENGR 202H

ENGR 203. ELECTRICAL FUNDAMENTALS III. (3 Credits)
Laplace transforms, Fourier series, Bode plots, and their application to circuit analysis.
Prerequisites: (ENGR 201 with C or better or ENGR 201H with C or better) and (ENGR 202 [C] or ENGR 202H [C]) and (MTH 256 [C] or MTH 256H [C])
ENGR 211. STATICS. (3 Credits)
Analysis of forces induced in structures and machines by various types of loading. Lec/rec.
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: ENGR 211H
ENGR 211H. STATICS. (3 Credits)
Analysis of forces induced in structures and machines by various types of loading. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: ENGR 211H
ENGR 212. DYNAMICS. (3 Credits)
Kinematics, Newton's laws of motion, and work-energy and impulse-momentum relationships applied to engineering systems. Lec/rec.
Prerequisites: (ENGR 211 with C or better or ENGR 211H with C or better) and (PH 211 [C] or PH 211H [C])
Equivalent to: ENGR 212H
ENGR 212H. DYNAMICS. (3 Credits)
Kinematics, Newton's laws of motion, and work-energy and impulse-momentum relationships applied to engineering systems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 211 with C or better or ENGR 211H with C or better) and (PH 211 [C] or PH 211H [C])
Equivalent to: ENGR 212H
ENGR 213. STRENGTH OF MATERIALS. (3 Credits)
Properties of structural materials; analysis of stress and deformation in axially loaded members, circular shafts, and beams, and in statically indeterminate systems containing these components. Lec/rec.
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better
Equivalent to: ENGR 213H
ENGR 213H. STRENGTH OF MATERIALS. (3 Credits)
Properties of structural materials; analysis of stress and deformation in axially loaded members, circular shafts, and beams, and in statically indeterminate systems containing these components. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better
Equivalent to: ENGR 213H
ENGR 221. THE SCIENCE, ENGINEERING AND SOCIAL IMPACT OF NANOTECHNOLOGY. (3 Credits)
Nanotechnology is an emerging engineering field that manipulates atoms and molecules to fabricate new materials and tiny devices. Properties of nanostructured materials, manufacturing methods, characterization methods, and impact on health and safety. Benefits and concerns about nanotechnology will be assessed. Lec/rec. CROSSLISTED as ENG 221/ MATHS 221.
Equivalent to: MATS 221
Recommended: One year of college science.

ENGR 248. ENGINEERING GRAPHICS AND 3-D MODELING. (3 Credits)
Introduction to graphical communication theory, including freehand sketching techniques, geometric construction, multi-view, pictorial, sectional and auxiliary view representation and dimensioning techniques. Practical application of theoretical concepts using solid modeling software to capture design intent and generate engineering drawings. Lec/Lab.

ENGR 299. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: ENGR 299H
This course is repeatable for 16 credits.
ENGR 299H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 299
This course is repeatable for 16 credits.
ENGR 350. *SUSTAINABLE ENGINEERING. (3 Credits)
Examination of technological innovations and alternatives required to maintain human quality of life and environmental sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: ENGR 350H
ENGR 350H. *SUSTAINABLE ENGINEERING. (3 Credits)
Examination of technological innovations and alternatives required to maintain human quality of life and environmental sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ENGR 350
ENGR 352. *CREATIVE COLLABORATION: DESIGNING AND BUILDING. (3 Credits)
Working in multi-disciplinary teams, design, implement, and document a piece of public art work or science museum display. Projects may be made of any media, but must demonstrate creativity both in the engineering used to create them and the technology and society message they convey. CROSSLISTED as ART 352/ENGR 352. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ART 352
ENGR 363. *ENERGY MATTERS. (3 Credits)
Establishes a basic energy vocabulary, applies the fundamental concepts of identifying energy use and determining efficiency, and studies the implications of energy decisions in the context of traditional, alternative, and sustainable energy resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: ENGR 363H
Recommended: MTH 112 or higher
ENGR 363H. *ENERGY MATTERS. (3 Credits)
Establishes a basic energy vocabulary, applies the fundamental concepts of identifying energy and determining efficiency, and studies the implications of energy decisions in the context of traditional, alternative, and sustainable energy resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ENGR 363
Recommended: MTH 112 or higher
ENGR 390. ENGINEERING ECONOMY. (3 Credits)
Time value of money; economic study techniques, depreciation, taxes, retirement, and replacement of engineering facilities.
ENGR 391. ENGINEERING ECONOMICS AND PROJECT MANAGEMENT. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Economic, time, and performance parameters of engineering projects are analyzed from the organizational and resource perspectives. Network optimization and simulation concepts are introduced. Fundamental engineering economics concepts are introduced and applied to planning and managing projects.
Equivalent to: ENGR 391H

ENGR 391H. ENGINEERING ECONOMICS AND PROJECT MANAGEMENT. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Economic, time, and performance parameters of engineering projects are analyzed from the organizational and resource perspectives. Network optimization and simulation concepts are introduced. Fundamental engineering economics concepts are introduced and applied to planning and managing projects.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 391

ENGR 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ENGR 399H
This course is repeatable for 16 credits.

ENGR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 399
This course is repeatable for 16 credits.

ENGR 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: ENGR 407H
This course is repeatable for 16 credits.

ENGR 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 407
This course is repeatable for 16 credits.

ENGR 450. PROFESSIONAL PREPARATION FOR BEGINNING LEVEL ENGINEERS. (1 Credit)
Practical training on professional skills essential for a career as a practicing engineer. Covers development of networking and interviewing skills, preparation of a resume and related online media, and guidance on future professional development. As this is a graduate-level course, it will include guidance on how students can develop and present themselves in ways that differentiate their abilities from those of more junior engineers.

ENGR 451. APPLIED IMAGING AND IMAGE PROCESSING. (3 Credits)
Explore image formats, storage issues, characteristics and significance of histograms; define and explain image artifacts such as random and periodic noise. Implement different image processing operations such as filters, registration, and mathematical algorithms to enhance an image and facilitate subsequent segmentation such as histogram thresholding, cluster analysis, watershed analysis, etc. Make quantitative measurements from images, such as length, area, orientation, connectivity, anisotropy, and perimeter of objects, as well as porosities, surface areas and curvatures. Apply advanced image analysis via skeletonization, morphological/ topological analysis, surface generation/ triangulation etc.
This course is repeatable for 3 credits.
Recommended: Introductory preparation in mathematical analysis, vectors, matrices, probability, statistics, linear systems, and computer programming

ENGR 550. PROFESSIONAL PREPARATION FOR ENGINEERS. (1 Credit)
Practical training on professional skills essential for a career as a practicing engineer. Covers development of networking and interviewing skills, preparation of a resume and related online media, and guidance on future professional development. As this is a graduate-level course, it will include guidance on how students can develop and present themselves in ways that differentiate their abilities from those of more junior engineers.

ENGR 555. FOUNDATIONS OF ENGINEERING EDUCATION RESEARCH AND PRACTICE. (3 Credits)
An examination as to why engineering education is practiced and researched the way that it is through reading, discussion and writing. The focus of the course will be on written and verbal interactions informed by careful reading of assigned texts.

ENGR 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Outdoor Products

OP 101. INTRODUCTION TO THE OUTDOOR PRODUCTS INDUSTRY. (4 Credits)

OP 231. EXPERIENCE OUTDOOR PRODUCTS - WATER. (2 Credits)
Hands-on experience with multiple water-related outdoor products in classroom and outdoor settings. Identifying key characteristics for consumers and implications for design, development, marketing, business, and sustainability. Evaluating product performance and developing ideas for objective improvements. Includes one mandatory weekend outdoor-experience outing.

OP 232. EXPERIENCE OUTDOOR PRODUCTS - WINTER. (2 Credits)
Hands-on experience with multiple winter-related outdoor products in classroom and outdoor settings. Identifying key characteristics for consumers and implications for design, development, marketing, business, and sustainability. Evaluating product performance and developing ideas for objective improvements. Includes one mandatory weekend outdoor-experience outing.
**Humanitarian Engineering Minor**

The Humanitarian Engineering minor provides multidisciplinary academic course work for students interested in the application of engineering, science, and technology-based solutions to global development challenges such as access to basic resources (e.g., clean water, clean energy), improved quality of life, and increased ability to earn a livelihood particularly in rural, resource-limited or low-to-middle income settings. A core of course work in humanitarian engineering, science and technology (HEST) is required with an emphasis on engineering as demonstrated by completion of the engineering design class (with engineering prerequisites). Both in the core course work and in the electives, there is an emphasis on context including social, cultural, economic, resource, political, and environmental.

**Minor Code: 769**

**Core with Engineering Emphasis**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 482</td>
<td>*ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HEST 411</td>
<td>ENGINEERING DESIGN FOR EMERGENCY &amp; LOW-RESOURCE ENVIRONMENTS</td>
<td>3</td>
</tr>
</tbody>
</table>

Select from the following courses or new HEST courses that will be approved:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEST 410</td>
<td>*INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>HEST 412</td>
<td>*MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

**Thematic Electives**

Select 11-14 credits

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ANTH 466</td>
<td>*RURAL ANTHROPOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>ANTH 482</td>
<td>*ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 322</td>
<td>*STUDIES IN GLOBALISM, TEXT, AND EVENT</td>
<td>4</td>
</tr>
<tr>
<td>GEO 308</td>
<td>*GLOBAL CHANG</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
<td>3</td>
</tr>
<tr>
<td>GWS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>H 225</td>
<td>*SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
<td>4</td>
</tr>
<tr>
<td>WGSS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WGSS 480</td>
<td>*GENDER AND TRANSNATIONAL ACTIVISMS</td>
<td>3</td>
</tr>
<tr>
<td>HEST 411</td>
<td>ENGINEERING DESIGN FOR EMERGENCY &amp; LOW-RESOURCE ENVIRONMENTS</td>
<td>4</td>
</tr>
<tr>
<td>HEST 412</td>
<td>*MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>HEST 310</td>
<td>*INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>HEST 310</td>
<td>*INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN</td>
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</table>

**Synthesis-Contemporary Global Issues**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ANTH 374</td>
<td>*ANTHROPOLOGY AND GLOBAL HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 380</td>
<td>*CULTURES IN CONFLICT</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 466</td>
<td>*RURAL ANTHROPOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>ANTH 482</td>
<td>*ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>FW 325</td>
<td>*GLOBAL CRISIS IN RESOURCE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>GEO 308</td>
<td>*GLOBAL CHANGE AND EARTH SCIENCES</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>*GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>*GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>*GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>*GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>*GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td>4</td>
</tr>
<tr>
<td>PHL 443</td>
<td>*WORLD VIEWS AND ENVIRONMENTAL SCIENCES</td>
<td>3</td>
</tr>
<tr>
<td>PS 345</td>
<td>*POLITICS OF DEVELOPING NATIONS</td>
<td>4</td>
</tr>
<tr>
<td>PS 458</td>
<td>*INTERNATIONAL POLITICAL ECONOMY</td>
<td>4</td>
</tr>
<tr>
<td>SDC 480</td>
<td>*ENVIRONMENTAL SOCIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>SUS 350</td>
<td>*SUSTAINABLE COMMUNITIES</td>
<td>4</td>
</tr>
<tr>
<td>WGS 380</td>
<td>*MUSLIM WOMEN</td>
<td>3</td>
</tr>
<tr>
<td>WGS 480</td>
<td>*GENDER AND TRANSNATIONAL ACTIVISMS</td>
<td>3</td>
</tr>
<tr>
<td>Z 349</td>
<td>*BIODIVERSITY, CAUSES, CONSEQUENCES, AND CONSERVATION</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note on counting credits towards each category:** The credits from a single course cannot be applied to satisfy the credit requirements for more than one category (Core, Thematic Electives, International or Service Learning Component). For example, 3 credits of HEST 310 cannot count towards both 11-credit minimum for thematic electives AND 3 credits of service learning. However, 3 credits of HEST 310 could count towards a total of 14 credits thematic electives AND satisfy the service learning requirement at the 0-credit level. Similarly, 4 credits of ANTH 482 cannot be counted towards the 13-credit HEST Core and towards the 11-credit minimum of thematic electives.

**Bacc Core Playlist for Thematic Electives**

There are two categories of baccalaureate core courses that will count for thematic electives.

1. List I shows courses that are particularly recommended because of the relevance of material and/or instructor affiliation with the program.
2. List II contains all of the courses that will fulfill thematic elective credits for the minor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Diversity</td>
<td>WGSS 280</td>
<td>*WOMEN WORLDWIDE</td>
</tr>
<tr>
<td>Literature and the Arts</td>
<td>ENG 322</td>
<td>*STUDIES IN GLOBALISM, TEXT, AND EVENT</td>
</tr>
<tr>
<td>Physical Science</td>
<td>WSE 210</td>
<td>*RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION</td>
</tr>
<tr>
<td>Social Processes and Institutions</td>
<td>H 225</td>
<td>*SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
</tr>
<tr>
<td>WGSS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>Western Culture</td>
<td>PHL 205</td>
<td>*ETHICS</td>
</tr>
<tr>
<td>Difference, Power, and Discrimination</td>
<td>ENG 220</td>
<td>*TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION</td>
</tr>
<tr>
<td>or FILM 220</td>
<td>*TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION</td>
<td>4</td>
</tr>
<tr>
<td>FW 340</td>
<td>*MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES</td>
<td>3</td>
</tr>
<tr>
<td>GEO 309</td>
<td>*ENVIRONMENTAL JUSTICE</td>
<td>3</td>
</tr>
<tr>
<td>MB 330</td>
<td>*DISEASE AND SOCIETY</td>
<td>3</td>
</tr>
<tr>
<td>WGSS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WGSS 414</td>
<td>*SYSTEMS OF OPPRESSION IN WOMEN'S LIVES</td>
<td>4</td>
</tr>
</tbody>
</table>

**Synthesis-Science, Technology, and Society**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 330</td>
<td>*EVOLUTION OF PEOPLE, TECHNOLOGY, AND SOCIETY</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 481</td>
<td>*NATURAL RESOURCES AND COMMUNITY VALUES</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 350</td>
<td>*SUSTAINABLE ENGINEERING</td>
<td>3</td>
</tr>
</tbody>
</table>
The International Engineering minor offers undergraduate engineering students an opportunity to certify their global competencies and demonstrate their understanding of the intercultural needs of modern engineers. By combining an engineering experience abroad, courses from a generalized global core, thematic elective courses, and the signature course for the minor, students may demonstrate their readiness for the increasingly global field of engineering.

**Minor Code: 476**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Core</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 9-12 credits of the following:</td>
<td>9-12</td>
<td></td>
</tr>
<tr>
<td>ANTH 210</td>
<td>*COMPARATIVE CULTURES</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 330</td>
<td>*EVOLUTION OF PEOPLE, TECHNOLOGY, AND SOCIETY</td>
<td>3</td>
</tr>
<tr>
<td>FW 325</td>
<td>*GLOBAL CRISIS IN RESOURCE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 105</td>
<td>*GEOGRAPHY OF THE NON-WESTERN WORLD</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 313</td>
<td>*GEOGRAPHY OF ASIA</td>
<td>3</td>
</tr>
<tr>
<td>HST 351</td>
<td>*MODERN LATIN AMERICA</td>
<td>4</td>
</tr>
<tr>
<td>HST 391</td>
<td>*TRADITIONAL CHINA AND JAPAN</td>
<td>4</td>
</tr>
<tr>
<td>HST 392</td>
<td>*MODERN CHINA AND JAPAN</td>
<td>4</td>
</tr>
<tr>
<td>MUS 108</td>
<td>*MUSIC CULTURES OF THE WORLD</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 216</td>
<td>*FOOD IN NON-WESTERN CULTURE</td>
<td>3</td>
</tr>
<tr>
<td>PHL 160</td>
<td>*QUESTS FOR MEANING: WORLD RELIGIONS</td>
<td>4</td>
</tr>
<tr>
<td>or REL 160</td>
<td>or REL 160 *QUESTS FOR MEANING: WORLD RELIGIONS</td>
<td>3</td>
</tr>
<tr>
<td>PHL 315</td>
<td>*GANDHI AND NONVIOLENCE</td>
<td>4</td>
</tr>
<tr>
<td>WICSS 280</td>
<td>*WOMEN WORLDWIDE</td>
<td>3</td>
</tr>
<tr>
<td><strong>Literature and the Arts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 210</td>
<td>*LITERATURES OF THE WORLD: ASIA</td>
<td>4</td>
</tr>
<tr>
<td>ENG 212</td>
<td>*LITERATURES OF THE WORLD: MESO/SOUTH AMERICA, CARIBBEAN</td>
<td>4</td>
</tr>
<tr>
<td>ENG 213</td>
<td>*LITERATURES OF THE WORLD: MIDDLE EAST</td>
<td>4</td>
</tr>
<tr>
<td>ENG 260</td>
<td>*LITERATURE OF AMERICAN MINORITIES</td>
<td>4</td>
</tr>
<tr>
<td>ENG 222</td>
<td>*STUDIES IN GLOBALISM, TEXT AND EVENT</td>
<td>4</td>
</tr>
<tr>
<td>ES 334</td>
<td>*ASIAN PACIFIC AMERICAN LITERATURE</td>
<td>4</td>
</tr>
<tr>
<td><strong>Physical Science</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEO 221</td>
<td>*ENVIRONMENTAL GEOLOGY</td>
<td>4</td>
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<tr>
<td>SOIL 205</td>
<td>*SOIL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>&amp; SOIL 206</td>
<td>and *SOIL SCIENCE LABORATORY FOR SOIL 205</td>
<td>3</td>
</tr>
<tr>
<td>WSE 210</td>
<td>*RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION</td>
<td>4</td>
</tr>
<tr>
<td><strong>Social Processes and Institutions</strong></td>
<td></td>
<td></td>
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<tr>
<td>AEC 250</td>
<td>*INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 110</td>
<td>*INTRODUCTION TO CULTURAL ANTHROPOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>H 225</td>
<td>*SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
<td>4</td>
</tr>
<tr>
<td>PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td>4</td>
</tr>
<tr>
<td>SOC 204</td>
<td>*INTRODUCTION TO SOCIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>SOC 205</td>
<td>*INSTITUTIONS AND SOCIAL CHANGE</td>
<td>3</td>
</tr>
<tr>
<td>WGS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WGS 224</td>
<td>*WOMEN: PERSONAL AND SOCIAL CHANGE</td>
<td>3</td>
</tr>
<tr>
<td>Western Culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AEC 253</td>
<td>*ENVIRONMENTAL LAW, POLICY, AND ECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 106</td>
<td>*GEOGRAPHY OF THE WESTERN WORLD</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Each course in the global core also satisfies a baccalaureate core requirement. Students may complete some of these courses to fulfill their baccalaureate core while also applying those credits to the International Engineering minor if they choose.

**School of Chemical, Biological and Environmental Engineering**

The School of Chemical, Biological, and Environmental Engineering (CBE) offers three undergraduate programs: Chemical Engineering (CHE), Bioengineering (BIOE), and Environmental Engineering (ENVE).
The Bachelor of Science and Honors Bachelor of Science degrees in Bioengineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The Bachelor of Science and Honors Bachelor of Science degrees in Chemical Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The Bachelor of Science and Honors Bachelor of Science degrees in Environmental Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The Bachelor of Arts degrees in CHE, BIOE, and ENVE are not accredited by ABET.

The goals of the CBEE undergraduate program are consistent with the mission and goals of the College of Engineering, and focus on creating work- and leadership-ready graduates who will be successful in professional careers as a chemical engineer, bioengineer, or environmental engineer in the private or public sectors, including industry, government, and consulting, as well as for continued graduate study in the same or closely related fields.

Chemical engineering (CHE) is the engineering discipline that focuses on the science and engineering of processes to convert raw materials into valued chemicals and products on a manufacturing scale.

Bioengineering (BIOE) is an interdisciplinary field that applies scientific and engineering principles to the development of new biologics, materials, devices, and processes in the broad areas of bioprocess, biomedical, and bioenvironmental technology.

Environmental engineering (ENVE) is the engineering discipline that applies scientific and engineering principles to improve the natural environment, to provide healthy water, air, and land, and to remediate polluted sites.

The educational objectives and curriculum are described separately for each CHE, BIOE, and ENVE program. The school has a core undergraduate curriculum where CHE, BIOE, and ENVE students take common courses in first through senior years, including first-year engineering, process material and energy balances, thermodynamics and transport phenomena, and senior year laboratory.

The school also offers graduate programs in bioengineering, chemical engineering, and environmental engineering leading to MEng, MS, and PhD degrees.

Undergraduate Programs

Majors

- Bioengineering (p. 408)
- Chemical Engineering (p. 411)
- Environmental Engineering (p. 414)

Minor

- Environmental Engineering (p. 415)

Graduate Programs

Majors

- Bioengineering (p. 408)
- Chemical Engineering (p. 410)
- Environmental Engineering (p. 414)

Minors

- Chemical Engineering (p. 411)
- Environmental Engineering (p. 415)

Jeffrey Nason, Interim School Head
116 Johnson Hall
Oregon State University
Corvallis, OR 97331-2702
Phone: 541-737-4791
Email: cbee@oregonstate.edu
Website: http://cbee.oregonstate.edu/

Faculty

Professors Chang, Herman, Jovanovic, Koretsky, Rorrer, Semprini¹, Wildenschield, Wood
Associate Professors Bothwell, Dolan, Harper, Higgins, Kelly, Nason, Rochefort
Assistant Professors AuYeung, Arnadottir, Baio, Feng, Fu, Giers, Goulas, Montfort, Navab Daneshmand, Radniecki, Schilke, Simon, Stoerzinger
Professional Practice Engineers Carlisle, Mallette
Linus Pauling Engineer Harding¹

¹Licensed professional engineer

Biological Engineering

BIOE 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 340. BIOMEDICAL ENGINEERING PRINCIPLES. (3 Credits)
Application of engineering concepts (mass and energy conservation, thermodynamics, and transport phenomena) to cellular- and system-level human physiology; design considerations for biomedical interventions and devices.

Prerequisites: (BI 231 with C or better or Z 331 with C or better) and (CHE 332 [C] or CHE 332H [C])
Recommended: Completion or concurrent enrollment in BI 233 and (CHE 333 or CHE 333H)

BIOE 351. BIOMATERIALS AND BIOINTERFACES. (3 Credits)
Material interactions with human tissue, with emphasis on the role of interfacial chemistry and physics in cell adhesion, infection, blood coagulation and thrombosis. Preparation of functional hydrogels, material coatings, and derivitizations, including immobilized bio-active molecules. Issues surrounding regulation of implants and device failure.

Prerequisites: (BB 451 (may be taken concurrently) with C or better or BB 451H (may be taken concurrently) with C or better) and (CHE 333 (may be taken concurrently) [C] or CHE 333H (may be taken concurrently) [C])

BIOE 399. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BIOE 399H
This course is repeatable for 16 credits.
BIOE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 415. BIOENGINEERING LABORATORY. (3 Credits)
Laboratory experimentation with unit operations and processes in bioengineering; preparation of technical reports.
Prerequisites: CBEE 414 with C or better

BIOE 420. SOCIAL JUSTICE, ETHICS, AND ENGINEERING. (3 Credits)
Examination of difference, power, and discrimination in engineering education and practice. Lec/rec.
Prerequisites: CBEE 320 with C or better

BIOE 440. BIOCONJUGATION. (3 Credits)
Survey of theory and practical current methods for chemical modification and conjugation of proteins and other biomolecules. Topics include permanent and cleavable cross-linkers, protein modification reagents, immobilization of enzymes/DNA, enzyme-antibody conjugates, protein-protein interactions, PEGylation and labeling of proteins, and solid-phase peptide synthesis.
Prerequisites: BB 450 with C or better

BIOE 445. SURFACE ANALYSIS. (3 Credits)
The characterization of molecular, biological, and engineered surfaces by modern surface analytical techniques. Topics include surface sensitive modes of electron spectroscopy, vibrational spectroscopy, and mass spectrometry. Students will interpret surface analytical data and gain access to the surface science literature.
Prerequisites: BIOE 351 (may be taken concurrently) with C or better

BIOE 457. BIOREACTORS. (3 Credits)
Design and analysis of bioreactors using suspension and immobilized microbial cultures.
Prerequisites: (BB 451 with C or better or BB 451H with C or better) and (CHE 333 [C] or CHE 333H [C])

BIOE 490. BIOENGINEERING PROCESS DESIGN. (4 Credits)
Prerequisites: CHE 333 with C or better or CHE 333H with C or better
Recommended: BIOE 457

BIOE 491. BIOENGINEERING PRODUCT DESIGN. (4 Credits)
Design of biomedical and biotechnology-based products. Applications of a structured design process, meeting customer needs and regulatory considerations to design.
Prerequisites: BIOE 490 with C or better

BIOE 492. BIOENGINEERING CAPSTONE DESIGN. (4 Credits)
Culminating experience in bioengineering design of processes and devices. Includes capstone project prototyping, testing and documentation, and constraints in ethics, intellectual property, standards, regulatory, and manufacturing.
Prerequisites: BIOE 491 with C or better

BIOE 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 503. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

BIOE 507. SEMINAR. (1 Credit)
Graded P/N.
This course is repeatable for 3 credits.

BIOE 511. CELLULAR AND MOLECULAR BIOENGINEERING. (3 Credits)
Fundamentals of mammalian cell biology, with an emphasis on biomedical applications and engineering approaches to study and manipulate cells and tissues.
Recommended: A working knowledge of cell biology and biochemistry

BIOE 512. MODELING OF PHYSIOLOGICAL SYSTEMS. (4 Credits)
Integration of engineering principles and human physiology in the areas of: transport phenomena in the cardiopulmonary and renal systems, bioelectricity in the nervous system, and mechanics of the musculoskeletal system.

BIOE 513. DRUG AND MEDICAL DEVICE REGULATIONS IN TECHNOLOGY DEVELOPMENT. (2 Credits)
Overview of the processes by which drugs and devices are regulated by the Food and Drug Administration. Topics include drug and device classifications, approval routes for different classes of drugs and devices, current good manufacturing practices, process validation, and quality assurance and control.

BIOE 520. SOCIAL JUSTICE, ETHICS, AND ENGINEERING. (3 Credits)
Examination of difference, power, and discrimination in engineering education and practice. Lec/rec.

BIOE 540. BIOCONJUGATION. (3 Credits)
Survey of theory and practical current methods for chemical modification and conjugation of proteins and other biomolecules. Topics include permanent and cleavable cross-linkers, protein modification reagents, immobilization of enzymes/DNA, enzyme-antibody conjugates, protein-protein interactions, PEGylation and labeling of proteins, and solid-phase peptide synthesis.
Recommended: BB 450
**BIOE 545. SURFACE ANALYSIS. (3 Credits)**
The characterization of molecular, biological, and engineered surfaces by modern surface analytical techniques. Topics include surface sensitive modes of electron spectroscopy, vibrational spectroscopy, and mass spectrometry. Students will interpret surface analytical data and gain access to the surface science literature.

**Recommended:** BIOE 351

**BIOE 557. BIOREACTORS. (3 Credits)**
Design and analysis of bioreactors using suspension and immobilized microbial cultures.

**Recommended:** (BB 451 or BB 451H) and (CHE 333 or CHE 333H)

**BIOE 562. BIOSEPARATIONS. (3 Credits)**
Application of basic mass transfer, reaction kinetics and thermodynamic principles to understanding, selection, and development of strategies for the recovery of products from bioreactors.

**Recommended:** BB 451 and CHE 332

**BIOE 599. SPECIAL TOPICS. (1-16 Credits)**
This course is repeatable for 16 credits.

**BIOE 603. THESIS. (1-16 Credits)**
Graded P/N.

*This course is repeatable for 999 credits.*

## Chemical, Biological and Environmental Engineering

**CBEE 101. CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION. (3 Credits)**
Introduction to the engineering profession in general and in particular the CHE, BIOE, and ENVE programs; development of problem solving strategies and teamwork; analysis and presentation of experimental data, basic process calculations, and design methodologies.

**Equivalent to:** BIOE 101, CBEE 101H, CHE 101, ENVE 101

**CBEE 101H. CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION. (3 Credits)**
Introduction to the engineering profession in general and in particular the CHE, BIOE, and ENVE programs; development of problem solving strategies and teamwork; analysis and presentation of experimental data, basic process calculations, and design methodologies.

**Attributes:** HNRS – Honors Course Designator

**Equivalent to:** CBEE 101

**CBEE 102. ENGINEERING PROBLEM SOLVING AND COMPUTATIONS. (3 Credits)**
Elementary programming and problem-solving concepts implemented using MATLAB software; emphasis on problem analysis and development of algorithms in engineering including dimensional analysis; application experiences are established through team-based activities including projects using the LEGO-NXT microprocessor for data acquisition.

**Prerequisites:** MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better

**Equivalent to:** BIOE 102, CBEE 102H, CHE 102, ENVE 102

**CBEE 102H. ENGINEERING PROBLEM SOLVING AND COMPUTATIONS. (3 Credits)**
Elementary programming and problem-solving concepts implemented using MATLAB software; emphasis on problem analysis and development of algorithms in engineering including dimensional analysis; application experiences are established through team-based activities including projects using the LEGO-NXT microprocessor for data acquisition.

**Attributes:** HNRS – Honors Course Designator

**Prerequisites:** MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better

**Equivalent to:** CBEE 102

**CBEE 111. ENGINEERING PROBLEM SOLVING FUNDAMENTALS. (3 Credits)**
Engineering problem solving, dimensional analysis, sketches and drawings, algorithmic thinking, arrays and indexing, understanding the operating system and file handling, the concepts of programming languages and syntax, troubleshooting approaches to coding. Lec/Studio.

*This course is repeatable for 3 credits.*

**CBEE 211. MATERIAL BALANCES AND STOICHIOMETRY. (3 Credits)**
Material balances, thermophysical, and thermochemical calculations. Lec/rec.

**Prerequisites:** MTH 252 with C or better or MTH 252H with C or better

**Equivalent to:** BIOE 211, CBEE 211H, CHE 211, ENVE 211

**Recommended:** General chemistry and second-year standing in engineering

**CBEE 211H. MATERIAL BALANCES AND STOICHIOMETRY. (3 Credits)**
Material balances, thermophysical, and thermochemical calculations. Lec/rec.

**Attributes:** HNRS – Honors Course Designator

**Prerequisites:** MTH 252 with C or better or MTH 252H with C or better

**Equivalent to:** CBEE 211

**Recommended:** General chemistry and second-year standing in engineering

**CBEE 212. ENERGY BALANCES. (3 Credits)**
Energy balances, thermophysical and thermochemical calculations. Lec/rec.

**Prerequisites:** (CBEE 211 with C or better or CBEE 211H with C or better) and (MTH 256 (may be taken concurrently) [C] or MTH 256H (may be taken concurrently) [C])

**Equivalent to:** BIOE 212, CBEE 212H, CHE 212, ENVE 212

**Recommended:** One year general chemistry and second-year standing in engineering

**CBEE 212H. ENERGY BALANCES. (3 Credits)**
Energy balances, thermophysical and thermochemical calculations. Lec/rec.

**Attributes:** HNRS – Honors Course Designator

**Prerequisites:** (CBEE 211 with C or better or CBEE 211H with C or better) and (MTH 256 (may be taken concurrently) [C] or MTH 256H (may be taken concurrently) [C])

**Equivalent to:** CBEE 212

**Recommended:** One year general chemistry and second-year standing in engineering
CHE 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: CHE 199H
This course is repeatable for 99 credits.

CHE 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CHE 199

CHE 299. PROFESSIONAL WORKSKILLS. (1-16 Credits)
Equivalent to: CHE 299H
This course is repeatable for 99 credits.
CHE 333H. TRANSPORT PHENOMENA III. (3 Credits)
A unified treatment using control volume and differential analysis of binary mass transfer; prediction of mass transport properties, and introduction to mass transfer operations. Lec/studio.
Attributes: HNRS – Honors Course Designator
Prerequisites: CHE 331 with C or better or CHE 331H with C or better or CHE 332 with C or better or CHE 332H with C or better
Equivalent to: CHE 333

CHE 334. TRANSPORT PHENOMENA LABORATORY. (3 Credits)
Engineering lab practices and the application of the macroscopic balances of mass, energy, and chemical species; fluid flow, heat and mass transfer experiments by teams for demonstrations of principles established in previous transport phenomena courses.
Prerequisites: CBEE 213 (may be taken concurrently) with C or better and (CHE 333 (may be taken concurrently) [C] or CHE 333H (may be taken concurrently) [C])

CHE 361. CHEMICAL PROCESS DYNAMICS AND SIMULATION. (3 Credits)
Fundamental principles for process dynamic modeling used in the control of process variables such as pressure, temperature, flow rate and chemical composition.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (CHE 331 [C] or CHE 331H [C])
Recommended: CBEE 102 and completion of concurrent enrollment in (CHE 331 or CHE 331H)

CHE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CHE 401. RESEARCH. (1-16 Credits)
Equivalent to: CHE 401H
This course is repeatable for 16 credits.

CHE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CHE 405H
This course is repeatable for 16 credits.

CHE 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CHE 405
This course is repeatable for 16 credits.

CHE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 411. MASS TRANSFER OPERATIONS. (4 Credits)
Mass transfer operations; design of separation processes. Lec/rec.
Prerequisites: CHE 312 with C or better and (CHE 333 [C] or CHE 333H [C])

CHE 415. CHEMICAL ENGINEERING LABORATORY I. (3 Credits)
Theoretical and empirical analysis of several unit operations, use of formal work processes, safety, teamwork, oral and written communication, and personal accountability. Lec/lab/rec.
Prerequisites: CBEE 414 with C or better and CHE 411 [C] and CHE 443 [C] and CHE 361 (may be taken concurrently) [C]
Equivalent to: CHE 415H, ENVE 415

CHE 417. INSTRUMENTATION IN CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGINEERING. (4 Credits)
equips students with a toolbox of instrumental techniques important in chemical, biological, and environmental engineering and the background required to determine the appropriate instrumental technique to address a specific problem. Lec/lab/rec.
Prerequisites: CHE 332 with C or better or CHE 335 with C or better
Recommended: (CHE 231 or CHE 231H) and (CHE 261 or CHE 261H) and (CHE 232 or CHE 232H) and (CHE 262 or CHE 262H) and (CHE 233 or CHE 233H) and (CHE 263 or CHE 263H)

CHE 431. CHEMICAL PLANT DESIGN I. (3 Credits)
Short-cut techniques and other abbreviated and useful methods for specifying equipment sufficient for the preliminary design of processes and equipment; estimating capital and manufacturing costs based on equipment specifications.
Prerequisites: CHE 312 with C or better and CHE 411 [C] and CHE 443 [C]

CHE 432. CHEMICAL PLANT DESIGN II. (3 Credits)
Transformation of preliminary design to detailed design; introduction to safety, ethical, economical, and environmental considerations in chemical plant design.
Prerequisites: CHE 431 with C or better

CHE 443. CHEMICAL REACTION ENGINEERING. (4 Credits)
Design of chemical reactors for economical processes and waste minimization. Contacting patterns, kinetics and transport rate effects in single phase and catalytic systems.
Prerequisites: CHE 312 with C or better and (CHE 333 [C] or CHE 333H [C])

CHE 444. THIN FILM MATERIALS PROCESSING. (4 Credits)
Solid state devices are based on the patterning of thin films. This lecture and lab course is primarily an introduction to the technology associated with processing thin films. Topics include chemical vapor deposition, physical vapor deposition, plasma etching, and thin-film characterization. Lec/lab/rec.
Prerequisites: CHE 443 (may be taken concurrently) with C or better
Recommended: CHE 443

CHE 445. POLYMER ENGINEERING AND SCIENCE. (4 Credits)
Polymer engineering and science with an emphasis on practical applications and recent developments. Topics include polymer synthesis, characterization, mechanical properties, rheology, and processing at a level suitable for most engineering and science majors. Lec/lab/rec.
Recommended: CHE 334 and CHE 335 and CHE 336 and (MTH 256 or MTH 256H) and/or junior standing in engineering or science

CHE 450. CONVENTIONAL AND ALTERNATIVE ENERGY SYSTEMS. (3 Credits)
Principles of energy conversion from chemical/mechanical energy to electrical energy including an overview of conventional energy systems and of likely renewable energy systems with a focus on the fundamental physico-chemical and thermodynamic concept for each technology. The economics of energy systems will also be discussed.
Prerequisites: CHE 311 (may be taken concurrently) with C or better or ME 311 (may be taken concurrently) with C or better or ME 311H (may be taken concurrently) with C or better or CHE 440 (may be taken concurrently) with C or better
CHE 451. SOLAR ENERGY TECHNOLOGIES. (3 Credits)
A foundation in the principles of solar energy processes is provided. Topics covered include photovoltaics and solar thermal, and will cover the fundamental solid state physics of semiconductors to applied heat transfer analysis of solar collectors. The course objective is to equip students with an adequate depth of understanding of the operational principles of solar energy systems, and to cover the breadth of the various approaches employed in active solar energy systems.
Prerequisites: CHE 311 (may be taken concurrently) with C or better and ME 311 (may be taken concurrently) with C or better or ME 311H (may be taken concurrently) with C or better or CH 440 (may be taken concurrently) with C or better
Recommended: CHE 311

CHE 452. ELECTROCHEMICAL ENERGY SYSTEMS. (3 Credits)
Introduces principles and processes of electrochemical energy storage and conversion systems. Topics include fundamentals of electrochemistry and concepts of electrochemical energy storage systems. Examples from batteries, fuel cells, supercapacitors devices will be discussed. Lec/rec.
Prerequisites: CHE 311 with C or better and (CHE 333 [C] or CHE 333H [C])

CHE 461. PROCESS CONTROL. (3 Credits)
Principles of PID feedback control based on models of chemical processes; analysis and implementation of proportional, integral and derivative tuning; cascade, feedforward, ratio and deadtime compensation; multivariable control and control system design issues and methods.
Prerequisites: (CHE 331 with C or better or CHE 331H with C or better) and (CHE 332 (may be taken concurrently) [C] or CHE 332H (may be taken concurrently) [C]) and CHE 361 [C]

CHE 499. SPECIAL TOPICS. (0-4 Credits)
This course is repeatable for 8 credits.

CHE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CHE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 514. FLUID FLOW. (4 Credits)
Fundamentals of fluid dynamics for Newtonian and non-Newtonian fluids; flow through porous media; two-phase flow. Lec/rec.

CHE 517. INSTRUMENTATION IN CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGINEERING. (4 Credits)
Equips students with a toolbox of instrumental techniques important in chemical, biological, and environmental engineering and the background required to determine the appropriate instrumental technique to address a specific problem. Lec/lab/rec.
Recommended: (CH 231 and CH 261 and CH 232 and CH 262 and CH 233 and CH 263)

CHE 520. MASS TRANSFER I. (4 Credits)

CHE 525. CHEMICAL ENGINEERING ANALYSIS. (4 Credits)
Modeling of physical and chemical processes; mathematical analysis of models with appropriate advanced techniques.

CHE 537. CHEMICAL ENGINEERING THERMODYNAMICS I. (4 Credits)
Applications of the fundamental laws of thermodynamics to complex systems. Properties of solutions of non-electrolytes. Phase and chemical equilibrium.

CHE 540. CHEMICAL REACTORS I. (4 Credits)
Catalysis, reactions coupled with transport phenomena. Reactors for high tech applications.

CHE 541. CATALYSIS. (3 Credits)
Introduction to topics related to catalysts and catalytic reactions. Course covers catalytic reaction mechanisms and kinetics, catalyst characterization and testing, and catalyst preparation and manufacturing processes.

CHE 542. MOLECULAR ASPECTS OF HETEROGENEOUS CATALYSIS. (3 Credits)
Introducing the principles of heterogeneous catalysis from the molecular aspect with emphasis on computational molecular approaches and surface science. The role of surface structure in heterogeneous catalytic reactions and surface interactions, development and analysis of reaction kinetics through microkinetic modeling approaches will be covered. A class project will utilize Density Functional Theory software to calculate catalytic properties of model systems.
Prerequisites: CHE 540 with C or better

CHE 544. THIN FILM MATERIALS PROCESSING. (4 Credits)
Solid state devices are based on the patterning of thin films. This lecture and lab course is primarily an introduction to the technology associated with processing thin films. Topics include chemical vapor deposition, physical vapor deposition, plasma etching, and thin-film characterization. Lec/lab/rec.
Recommended: CHE 443 or CHE 543

CHE 545. POLYMER ENGINEERING AND SCIENCE. (4 Credits)
Polymer engineering and science with an emphasis on practical applications and recent developments. Topics include polymer synthesis, characterization, mechanical properties, rheology, and processing at a level suitable for most engineering and science majors. Lec/lab/rec.
Recommended: CH 334 and CH 335 and CH 336 and MTH 256

CHE 550. CONVENTIONAL AND ALTERNATIVE ENERGY SYSTEMS. (3 Credits)
Principles of energy conversion from chemical/mechanical energy to electrical energy including an overview of conventional energy systems and of likely renewable energy systems with a focus on the fundamental physico-chemical and thermodynamic concept for each technology. The economics of energy systems will also be discussed.
Recommended: CHE 311 or ME 311 or ME 311H

CHE 551. SOLAR ENERGY TECHNOLOGIES. (3 Credits)
A foundation in the principles of solar energy processes is provided. Topics covered include photovoltaics and solar thermal, and will cover the fundamental solid state physics of semiconductors to applied heat transfer analysis of solar collectors. The course objective is to equip students with an adequate depth of understanding of the operational principles of solar energy systems, and to cover the breadth of the various approaches employed in active solar energy systems.
Recommended: CHE 311
CHE 552. ELECTROCHEMICAL ENERGY SYSTEMS. (3 Credits)
Introduces principles and processes of electrochemical energy storage and conversion systems. Topics include fundamentals of electrochemistry and concepts of electrochemical energy storage systems. Examples from batteries, fuel cells, supercapacitors devices will be discussed. Lec/rec.
Recommend: CHE 311 AND (CHE 333 or CHE 333H)

CHE 581. SELECTED TOPICS. (3 Credits)
Non-sequence course designed to acquaint students with recent advances in chemical engineering. Topics vary from term to term and from year to year. May be repeated for credit.
This course is repeatable for 9 credits.

CHE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CHE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CHE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 611. ELECTRONIC MATERIALS PROCESSING. (3 Credits)
Technology, theory, and analysis of processing methods used in integration circuit fabrication. Offered alternate years. CROSSLISTED as CHE 611/ECE 611.
Equivalent to: CHE 571, ECE 611

CHE 612. PROCESS INTEGRATION. (3 Credits)
Process integration, simulation, and statistical quality control issues related to integrated circuit fabrication. Offered alternate years. CROSSLISTED as CHE 612/ECE 612.
Equivalent to: CHE 572, ECE 612
Recommend: CHE 611 or ECE 611

CHE 613. ELECTRONIC MATERIALS AND CHARACTERIZATION. (3 Credits)
Physics and chemistry of electronic materials and methods of materials characterization. Offered alternate years. CROSSLISTED as CHE 613/ECE 613.
Equivalent to: CHE 573, ECE 613

Environmental Engineering

ENVE 199. SPECIAL TOPICS. (1-16 Credits)
Seminar course that includes invited speakers. Open to all students interested in learning about the Environmental Engineering undergraduate program and potential career opportunities. Graded P/N.
This course is repeatable for 16 credits.

ENVE 299. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: ENVE 299H
This course is repeatable for 16 credits.

ENVE 299H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 299
This course is repeatable for 16 credits.

ENVE 321. ENVIRONMENTAL ENGINEERING FUNDAMENTALS. (4 Credits)
Application of engineering principles to the analysis of environmental problems. Topics include water, wastewater, solid wastes, and air pollution.
Prerequisites: MTH 256 with C or better or MTH 256H with C or better

ENVE 322. FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING. (4 Credits)
Application of engineering principles to the analysis of environmental problems. Topics include water, wastewater, solid wastes, and air pollution.
Prerequisites: (CHE 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 225H with C or better) and (MTH 256 [C] or MTH 256H [C])

ENVE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 406. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 407. SEMINAR. (1-16 Credits)
Equivalent to: ENVE 407H
This course is repeatable for 16 credits.

ENVE 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 407
This course is repeatable for 16 credits.

ENVE 410. OCCUPATIONAL INTERNSHIP. (1-12 Credits)
This course is repeatable for 12 credits.

ENVE 415. ENVIRONMENTAL ENGINEERING LABORATORY. (3 Credits)
Theoretical and empirical analysis of several unit operations, use of formal work processes, safety, teamwork, oral and written communication, and personal accountability. Lec/lab/rec.
Prerequisites: CBEE 414 with C or better
Equivalent to: CHE 415

ENVE 421. DRINKING WATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of drinking water sources including engineering principles for the selection and design of treatment processes. Lec/rec/lab.
Prerequisites: ENVE 322 with C or better

ENVE 422. WASTEWATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of municipal and industrial wastewaters including engineering principles for the selection and design of treatment processes. Lec/rec.
Prerequisites: ENVE 421 with C or better

ENVE 425. AIR POLLUTION CONTROL. (3 Credits)
Study of air pollution sources, transport, and control, including engineering, chemical, meteorological, social, and economic aspects. Lec/rec.
Prerequisites: ENVE 321 with C or better or ENVE 322 with C or better
ENVE 431. FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS. (4 Credits)
Fundamentals of organic chemistry and engineering principles applied to the movement and fate of xenobiotic compounds. Lec/lab/rec.
Prerequisites: (CH 123 with C or better or CH 223 with C or better or CH 226H with C or better or CH 233 with C or better) and (CH 440 [C] or CHE 331 [C] or CHE 331H [C]) and (ENVE 321 [C] or ENVE 322 [C]) and ENVE 421 [C])
ENVE 465. SUSTAINABLE WATER RESOURCES DEVELOPMENT. (3 Credits)
Sustainable water resources engineering principles, assessing the impact of engineering practices. Use of engineering analyses and sustainable principles to design projects and minimize their environmental impact.
ENVE 457. BIOREACTORS. (3 Credits)
Design and analysis of bioreactors using suspension and immobilized microbial cultures.
Prerequisites: CHE 333 with C or better and ENVE 322 [C]
ENVE 490. ENVIRONMENTAL ENGINEERING DESIGN. (4 Credits)
Open-ended design of environmental processes including development of process flow diagrams, control strategies, process simulators, and financial analysis of processes. Lec/rec.
Prerequisites: ENVE 421 with C or better and ENVE 422 [C]
ENVE 499. SPECIAL TOPICS IN ENVIRONMENTAL ENGINEERING. (1-4 Credits)
A critical examination of topics selected by the instructor from among topics not covered in other environmental engineering courses. This course is repeatable for 4 credits.
ENVE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
ENVE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
ENVE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
ENVE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
ENVE 507. SEMINAR. (1-16 Credits)
One-credit seminar. Graded P/N. This course is repeatable for 16 credits.
ENVE 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
ENVE 521. DRINKING WATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of drinking water sources including engineering principles for the selection and design of treatment processes. Lec/rec/lab.
Recommended: ENVE 322
ENVE 522. WASTEWATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of municipal and industrial wastewaters including engineering principles for the selection and design of treatment processes. Lec/rec.
Recommended: ENVE 421
ENVE 525. AIR POLLUTION CONTROL. (3 Credits)
Study of air pollution sources, transport, and control, including engineering, chemical, meteorological, social, and economic aspects. Lec/rec.
Recommended: ENVE 321 or ENVE 322

ENVE 531. FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS. (4 Credits)
Fundamentals of organic chemistry and engineering principles applied to the movement and fate of xenobiotic compounds. Lec/lab/rec.
Recommended: (CH 123 or CH 223 or CH 226H or CH 233) and (CH 440 or CHE 331 or CHE 331H) and (ENVE 321 or ENVE 322) and ENVE 421
ENVE 532. AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS. (4 Credits)
Low temperature thermodynamic and selective kinetic treatments primarily of the inorganic chemistry groups, but also organic ligands and surface active groups, of natural and engineered waters; thermodynamic principles and computational techniques for prediction of equilibrium speciation; comparison of predictions to observations; computer laboratory. Lec/rec.
Equivalent to: OC 532
Recommended: One year of college-level chemistry (CH 221 and CH 222 and CH 223) or ((CH 231 or CH 231H) and (CH 232 or CH 232H) and (CH 233 or CH 233H)); a minimum of one year organic or physical chemistry; and concurrent enrollment in ENVE 536 and/or OC 652
ENVE 535. PHYSICAL AND CHEMICAL TREATMENT PROCESSES. (4 Credits)
Fundamental principles of physical and chemical processes relevant for the treatment of contaminants in environmental matrices (e.g. water, air and soil).
Prerequisites: ENVE 532 with C or better
Equivalent to: ENVE 538
ENVE 536. AQUEOUS ENVIRONMENTAL CHEMISTRY LABORATORY. (1 Credit)
Laboratory investigation of acid/base equilibria, coordination chemistry, and precipitation/dissolution chemistry.
Corequisites: ENVE 532
ENVE 541. MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS. (4 Credits)
Energetics kinetics and stoichiometry of microbial transformations of organic and inorganic compounds. Mathematical models of biodegradation.
ENVE 542. MICROBIAL PROCESS DESIGN FOR MUNICIPAL AND HAZARDOUS WASTES. (4 Credits)
Principles and design of microbial processes for treatment of municipal and hazardous wastes.
Prerequisites: ENVE 541 with C or better
ENVE 545. MICROBIAL METHODS IN ENVIRONMENTAL ENGINEERING. (3 Credits)
Covers the principles of microbiological methods pertinent to environmental engineers with an emphasis on applications in drinking water treatment, wastewater treatment, and soil remediation. The course is targeted at engineering students that do not have much experience with culture-based and molecular-based techniques.
Prerequisites: ENVE 541 with C+ or better
ENVE 554. GROUNDWATER REMEDIATION. (4 Credits)
ENVE 556. SUSTAINABLE WATER RESOURCES DEVELOPMENT. (3 Credits)
Sustainable water resources engineering principles, assessing the impact of engineering practices. Use of engineering analyses and sustainable principles to design projects and minimize their environmental impact.

ENVE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

ENVE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENVE 699. SELECTED TOPICS IN ENVIRONMENTAL ENGINEERING. (1-4 Credits)
A critical examination of topics selected by the instructors from among topics not covered in other environmental engineering courses.
Equivalent to: ENVE 611
This course is repeatable for 8 credits.

Bioengineering Graduate Major (MENG, MS, PhD)

Graduate Areas of Concentration
Biomaterials, biomedical devices and instrumentation, human performance engineering, medical imaging, systems and computation biology

The School of Chemical, Biological, and Environmental Engineering offers Master of Engineering (MEng), Master of Science (MS), and Doctor of Philosophy (PhD) degrees in Bioengineering. Students can choose from among the following areas of concentration: Biomaterials, Biomedical devices and Instrumentation, Human Performance Engineering, Medical Imaging, and Systems and Computational Biology. All programs are tailored to individual student needs and professional goals. A diversity of faculty interests, broadened and reinforced by cooperation between CBEE and other engineering departments and research centers on campus, makes tailored individual programs possible. The department originates and encourages programs ranging from those that are classically bioengineering to those that are distinctly interdisciplinary.

For more information, contact the Graduate Programs Coordinator, School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis, OR 97331-2904, 541-737-0479 or email cbee-gradinfo@engr.orst.edu

Major Code: 3080

Bioengineering Undergraduate Major (BA, BS, HBA, HBS)

The Bachelor of Science and Honors Bachelor of Science degrees in Bioengineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

Bioengineering is an interdisciplinary field that applies engineering principles and quantitative methods to the development of new and novel biologicals, materials, devices, and processes. In practice, bioengineers address issues surrounding the broad areas of bioprocess, biomedical, and bioenvironmental technology.

The bioengineering undergraduate program provides a solid background in biology, chemistry, physics and math, in addition to the engineering sciences. Upper-level course work in bioengineering includes the analysis and design of processes involving immobilized or suspended microbial cultures and the recovery of therapeutic products from bioreactors, as well as course work in biomedical materials engineering, biomedical engineering principles, and selected course work in cell engineering, surface analysis and bioconjugation. All students complete a capstone-design experience that integrates drug and medical device regulation.

Bioengineering graduates are prepared to contribute to the rapidly growing sector of bioscience-based industries, and to have the ability to formulate and solve problems pertaining to enzyme and microbial process technologies, mammalian cell culture, and downstream processing in biotechnology. They also generate solutions to problems with medical relevance, including the design of devices and systems to replace lost organ function, deliver therapeutic agents, and otherwise improve human health.

Alumni of the bioengineering program will be work-ready engineers, problem solvers, responsible professionals, and interdisciplinary collaborators. Program educational objectives can be found on the
Student Outcomes for Bioengineering Programs

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The bioengineering undergraduate curriculum is designed to meet these objectives through relevant course content, hands-on laboratory and design experiences at the first year through the senior levels, and structured, collaborative learning experiences. The school has a core curriculum where students from all three programs housed within the school (CHE, BIOE, ENVE) take common courses in the areas of first-year engineering, materials and energy balances, thermodynamics, transport phenomena and senior laboratory. Many scholarships are available on a competitive basis for bioengineering undergraduate students. More detailed descriptions of the curriculum and requirements may be viewed on the school’s website (https://cbee.oregonstate.edu/bioe-undergraduate-program/).

Major Code: 298

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<th>Hours</th>
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<td>CBEE 101</td>
<td>CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION</td>
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</tr>
<tr>
<td>CBEE 102</td>
<td>ENGINEERING PROBLEM SOLVING AND COMPUTATIONS</td>
<td>3</td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY &amp; CH 261 and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY &amp; CH 262 and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY &amp; CH 263 and *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
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<tr>
<td>COMM 111 or COMM 114</td>
<td>*PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
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<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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Second Year

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<tr>
<td>BI 231</td>
<td>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>CBEE 211</td>
<td>MATERIAL BALANCES AND STOICHIOMETRY</td>
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<td>CBEE 212</td>
<td>ENERGY BALANCES</td>
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<td>CBEE 213</td>
<td>PROCESS DATA ANALYSIS</td>
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<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>ENGR 201</td>
<td>ELECTRICAL FUNDAMENTALS I</td>
<td>3</td>
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<td>ENGR 211</td>
<td>STATICS</td>
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<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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<tr>
<td>MTH 306</td>
<td>MATRIX AND POWER SERIES METHODS</td>
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<td>PH 212</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
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<tr>
<td>PH 213</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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Biology selection 1 2-4 Perspectives 3

**Third Year**

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<tbody>
<tr>
<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
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<tr>
<td>&amp; BB 451 and GENERAL BIOCHEMISTRY</td>
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<tr>
<td>BIOE 340</td>
<td>BIOMEDICAL ENGINEERING PRINCIPLES</td>
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<tr>
<td>BIOE 351</td>
<td>BIOMATERIALS AND BIOINTERFACES</td>
<td>3</td>
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<tr>
<td>BIOE 420</td>
<td>SOCIAL, JUSTICE, ETHICS, AND ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>CBEE 320</td>
<td>PROFESSIONALISM AND ENGINEERING ETHICS</td>
<td>3</td>
</tr>
<tr>
<td>CHE 311</td>
<td>THERMODYNAMICS</td>
<td>3</td>
</tr>
<tr>
<td>CHE 331</td>
<td>TRANSPORT PHENOMENA I</td>
<td>4</td>
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<tr>
<td>CHE 332</td>
<td>TRANSPORT PHENOMENA II</td>
<td>3</td>
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<tr>
<td>CHE 333</td>
<td>TRANSPORT PHENOMENA III</td>
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<tr>
<td>WR 227</td>
<td>*TECHNICAL WRITING</td>
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<td>*Difference, Power, and Discrimination 5</td>
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<td>Bioengineering electives 3</td>
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<td>*Perspectives 3</td>
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**Fourth Year**

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<tr>
<td>BACC 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES I</td>
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</tr>
<tr>
<td>BIOE 415</td>
<td>BIOENGINEERING LABORATORY</td>
<td>3</td>
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<tr>
<td>BIOE 457</td>
<td>BIOREACTORS</td>
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<td>BIOE 462</td>
<td>BIOSEPARATIONS</td>
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<tr>
<td>BIOE 490</td>
<td>BIOENGINEERING PROCESS DESIGN</td>
<td>4</td>
</tr>
<tr>
<td>BIOE 491</td>
<td>BIOENGINEERING PRODUCT DESIGN</td>
<td>4</td>
</tr>
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<td>BIOE 492</td>
<td>BIOENGINEERING CAPSTONE DESIGN</td>
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<tr>
<td>CBEE 414</td>
<td>*PROCESS ENGINEERING LABORATORY</td>
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<td>Bioengineering elective 3</td>
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<td>Bioscience or Bioengineering elective 3, 4</td>
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<td>Engineering electives 2</td>
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<td>*Perspectives 3</td>
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<tr>
<td>*Synthesis 6</td>
<td>6</td>
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Total Hours 192-195

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Approved bioscience course from BIOE program list
2 Approved engineering elective from BIOE program list
3 Approved bioengineering elective from BIOE program list
4 Approved bioscience elective from BIOE program list
5 Approved DPIC elective from BIOE program list

Major Code: 298
## Chemical Engineering Graduate Major (MENG, MS, PhD)

### Graduate Areas of Concentration

**Chemical engineering**

The School of Chemical, Biological and Environmental Engineering offers graduate programs leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees. All programs are tailored to individual student needs and professional goals. A diversity of faculty interests, broadened and reinforced by cooperation between the school and other engineering departments and schools and research centers on campus, makes tailored individual programs possible. The school originates and encourages programs ranging from those that are classically chemical engineering to those that are distinctly interdisciplinary.

For more information, contact the Graduate Programs Coordinator, School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis, OR 97331-2904, 541-737-0479 or email cbee-gradinfo@engr.orst.edu

Major Code: 3030
### MEng Degree

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<th>Hours</th>
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<td>CBEE 507</td>
<td>SEMINAR (1 credit per term, 3 credits required)</td>
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<tr>
<td>CHE 514</td>
<td>FLUID FLOW</td>
<td>4</td>
</tr>
<tr>
<td>CHE 520</td>
<td>MASS TRANSFER I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 525</td>
<td>CHEMICAL ENGINEERING ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>CHE 537</td>
<td>CHEMICAL ENGINEERING THERMODYNAMICS I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 540</td>
<td>CHEMICAL REACTORS I</td>
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</table>

**Required Core**

**Electives**
- Graduate level courses offered through the College of Engineering: 10
- Courses approved by Graduate Program advisor on Graduate Program of Study: 12

**Total Hours:** 45

### MS Degree

<table>
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<th>Code</th>
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<th>Hours</th>
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<td>CBEE 507</td>
<td>SEMINAR (1 credit per term, 3 credits required)</td>
<td>3</td>
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<tr>
<td>CHE 514</td>
<td>FLUID FLOW</td>
<td>4</td>
</tr>
<tr>
<td>CHE 520</td>
<td>MASS TRANSFER I</td>
<td>4</td>
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<tr>
<td>CHE 525</td>
<td>CHEMICAL ENGINEERING ANALYSIS</td>
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<tr>
<td>CHE 537</td>
<td>CHEMICAL ENGINEERING THERMODYNAMICS I</td>
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<tr>
<td>CHE 540</td>
<td>CHEMICAL REACTORS I</td>
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</table>

**Required Core**

**Electives**
- Courses approved by student’s MS Committee on Graduate Program of Study: minimum 13
- Thesis: 9

**Total Hours:** 45

### PhD Degree

<table>
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<th>Hours</th>
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<td>CBEE 507</td>
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<td>CHE 514</td>
<td>FLUID FLOW</td>
<td>4</td>
</tr>
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<td>CHE 520</td>
<td>MASS TRANSFER I</td>
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<td>CHE 525</td>
<td>CHEMICAL ENGINEERING ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>CHE 537</td>
<td>CHEMICAL ENGINEERING THERMODYNAMICS I</td>
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</tr>
<tr>
<td>CHE 540</td>
<td>CHEMICAL REACTORS I</td>
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</table>

**Required Core**

**Minor Course Work/Electives**
- Courses approved by student’s PhD Committee on Graduate Program of Study: minimum 13
- Thesis: 36-72

**Total Hours:** 108

### Prerequisite and Corequisite Coursework for Non-engineering Undergraduates

MEng or MS students without undergraduate degrees in chemical engineering or a related engineering discipline, or PhD students without undergraduate degrees or graduate degrees in chemical engineering or a related engineering discipline, must take the following courses in addition to the CHE core:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CHE 312</td>
<td>CHEMICAL ENGINEERING THERMODYNAMICS I</td>
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<tr>
<td>CHE 331</td>
<td>TRANSPORT PHENOMENA I</td>
<td>4</td>
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<tr>
<td>CHE 332</td>
<td>TRANSPORT PHENOMENA II</td>
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</tr>
<tr>
<td>CHE 443</td>
<td>CHEMICAL REACTION ENGINEERING</td>
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</table>

In addition to Graduate School mandated preliminary and final exams, PhD students in chemical engineering must successfully complete a qualifying exam, the details and timing of which can be found in the chemical engineering graduate student handbook.

### Chemical Engineering Graduate Minor

**Major Code:** 3030

The Graduate Minor in Chemical Engineering is for masters and doctoral level students who seek additional formal training and mentoring in chemical engineering. Students pursuing a Minor in Chemical Engineering must include at least one Chemical Engineering faculty member on their committee. This faculty member must be engaged in the development of the student’s Program of Study and in the case of Doctoral students, their dissertation research; therefore, it is recommended that this faculty member be identified early in the doctoral program.

For more information, contact the Graduate Programs Coordinator, School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis, OR 97331-2904, 541-737-0479 or email cbee-gradinfo@engr.orst.edu

**Minor Code:** 3030

### Chemical Engineering Undergraduate Major (BA, BS, HBA, HBS)

The Bachelor of Science and Honors Bachelor of Science degrees in Chemical Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

Chemical engineering is the discipline that focuses on the science and engineering of processes to convert raw materials into valued chemicals and products at a manufacturing scale. These include products found in everyday life such as transportation and heating fuels, plastics, pharmaceuticals, household and paper products (soaps, cosmetics, health care and cleaning products, etc.), as well as more advanced products like solar cells, computer chips, and advanced composites for jet aircraft.

Chemical engineers find employment in traditional chemical industries such as pulp and paper manufacturing and petroleum refining, high-tech industries such as semiconductor device manufacturing, biopharmaceutical production, aerospace, and emerging industries, particularly sustainable energy.

Alumni of the chemical engineering program will be work-ready engineers, problem solvers, responsible professionals, and interdisciplinary collaborators. Program educational objectives can be found on the school’s website (https://cbee.oregonstate.edu/che-undergraduate-program/).
Student Outcomes for Chemical Engineering Programs

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The chemical engineering undergraduate curriculum is designed to meet these objectives through relevant course content, structured collaborative learning experiences, and hands-on laboratory and design experiences at the first year through senior levels. The school has a core curriculum where students from all three programs housed within the school (CHE, BIOE, ENVE) take common courses in the areas of first-year engineering, material and energy balances, thermodynamics, transport phenomena, and senior year laboratory.

Chemical engineering students have opportunities to obtain internships offered through the School of CBE, and through the Multiple Engineering Cooperative Program (MECOP). Many scholarships are available on a competitive basis for chemical engineering undergraduate students. More detailed descriptions of the curriculum and requirements may be viewed on the school's website (https://cbee.oregonstate.edu/che-undergraduate-program/).

Major Code: 303

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<td>First Year</td>
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<tr>
<td>CEEE 101</td>
<td>Chemical, Biological, and Environmental Engr Orientation</td>
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<tr>
<td>CEEE 102</td>
<td>Engineering Problem Solving and Computations</td>
<td>3</td>
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<tr>
<td>CH 231 &amp; CH 261</td>
<td>General Chemistry and *Laboratory for Chemistry 231</td>
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<tr>
<td>CH 232 &amp; CH 262</td>
<td>General Chemistry and *Laboratory for Chemistry 232</td>
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<tr>
<td>CH 233 &amp; CH 263</td>
<td>General Chemistry and *Laboratory for Chemistry 233</td>
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<td>MTH 251</td>
<td>*Differential Calculus</td>
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<td>MTH 252</td>
<td>Integral Calculus</td>
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<td>MTH 254</td>
<td>Vector Calculus</td>
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<td>PH 211</td>
<td>*General Physics with Calculus</td>
<td>4</td>
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<td>WR 121</td>
<td>*English Composition</td>
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<td>Biological science baccalaureate core lab course</td>
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<td>HHS 231</td>
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Second Year

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<td>CH 331 &amp; CH 332</td>
<td>Organic Chemistry and Organic Chemistry</td>
<td>8</td>
</tr>
<tr>
<td>CEEE 211</td>
<td>Material Balances and Stoichiometry</td>
<td>3</td>
</tr>
<tr>
<td>CEEE 212</td>
<td>Energy Balances</td>
<td>3</td>
</tr>
<tr>
<td>CEEE 213</td>
<td>Process Data Analysis</td>
<td>4</td>
</tr>
<tr>
<td>COMM 111 or COMM 114</td>
<td>*Public Speaking or *Argument and Critical Discourse</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 201</td>
<td>Electrical Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 211</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>MTH 256</td>
<td>Applied Differential Equations</td>
<td>4</td>
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<tr>
<td>MTH 306</td>
<td>Matrix and Power Series Methods</td>
<td>4</td>
</tr>
<tr>
<td>PH 212 &amp; PH 213</td>
<td>*General Physics with Calculus and *General Physics with Calculus</td>
<td>8</td>
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<tr>
<td>WR 327</td>
<td>*Technical Writing</td>
<td>2</td>
</tr>
<tr>
<td>Hours</td>
<td>46</td>
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Third Year

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<thead>
<tr>
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<tbody>
<tr>
<td>CH 440 &amp; CH 441 &amp; CH 442</td>
<td>Physical Chemistry and Physical Chemistry</td>
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</tr>
<tr>
<td>CEEE 311</td>
<td>Thermodynamics</td>
<td>3</td>
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<tr>
<td>CEEE 312</td>
<td>Chemical Engineering Thermodynamics</td>
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<tr>
<td>CEEE 320</td>
<td>Safety, Engineering Ethics and Professionalism</td>
<td>3</td>
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<tr>
<td>CEEE 331</td>
<td>Transport Phenomena I</td>
<td>4</td>
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<tr>
<td>CEEE 332</td>
<td>Transport Phenomena II</td>
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<td>CEEE 333</td>
<td>Transport Phenomena III</td>
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<tr>
<td>CEEE 334</td>
<td>Transport Phenomena Laboratory</td>
<td>3</td>
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<tr>
<td>CEEE 361</td>
<td>Chemical Process Dynamics and Simulation</td>
<td>3</td>
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<tr>
<td>CEEE 461</td>
<td>Process Control</td>
<td>3</td>
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<tr>
<td>*Perspectives</td>
<td>6</td>
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<tr>
<td>Advanced Chemistry</td>
<td>3</td>
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<tr>
<td>Engineering elective</td>
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<td>Hours</td>
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Fourth Year

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CEEE 411</td>
<td>Mass Transfer Operations</td>
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<tr>
<td>CEEE 414 &amp; CEEE 415</td>
<td>*Process Engineering Laboratory and Chemical Engineering Laboratory I</td>
<td>3</td>
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<tr>
<td>CEEE 431 &amp; CEEE 432</td>
<td>Chemical Plant Design I and Chemical Plant Design II</td>
<td>9</td>
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<tr>
<td>CEEE 443</td>
<td>Chemical Reaction Engineering</td>
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<tr>
<td>Elective</td>
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<tr>
<td>Advanced Chemistry with lab</td>
<td>4</td>
<td></td>
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<tr>
<td>Engineering elective</td>
<td>8</td>
<td></td>
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<tr>
<td>*Perspectives</td>
<td>3</td>
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<tr>
<td>Difference, Power, and Discrimination</td>
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<tr>
<td>*Synthesis</td>
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<tr>
<td>Credits to meet 192 graduation requirement</td>
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<tr>
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Total Hours: 162-193

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
+ Must be selected to satisfy the requirements of the baccalaureate core
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<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
<td><strong>Hours</strong></td>
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<tr>
<td><strong>First Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>CBE 101</td>
<td>CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION</td>
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<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td><strong>Winter</strong></td>
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<tr>
<td>*Biological Science with Lab</td>
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<tr>
<td>CBE 102</td>
<td>ENGINEERING PROBLEM SOLVING AND COMPUTATIONS</td>
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<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<td><strong>Spring</strong></td>
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<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>&amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td><strong>Hours</strong></td>
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<td><strong>Second Year</strong></td>
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<tr>
<td>CBE 211</td>
<td>MATERIAL BALANCES AND STOICHIOMETRY</td>
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<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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<tr>
<td><strong>Hours</strong></td>
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<td><strong>Winter</strong></td>
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<tr>
<td>CBE 212</td>
<td>ENERGY BALANCES</td>
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<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>MTH 306</td>
<td>MATRIX AND POWER SERIES METHODS</td>
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<td>PH 213</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
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<tr>
<td>Perspective *</td>
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<td>3</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
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<tr>
<td>CBE 213</td>
<td>PROCESS DATA ANALYSIS</td>
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<td>ENGR 201</td>
<td>ELECTRICAL FUNDAMENTALS I</td>
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<tr>
<td>ENGR 211</td>
<td>STATICS</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course) *</td>
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<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
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<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>CH 440</td>
<td>PHYSICAL CHEMISTRY</td>
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<tr>
<td>CHE 311</td>
<td>THERMODYNAMICS</td>
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<td>CHE 331</td>
<td>TRANSPORT PHENOMENA I</td>
<td>4</td>
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<tr>
<td>CHE 320</td>
<td>SAFETY, ENGINEERING ETHICS AND PROFESSIONALISM</td>
<td>3</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>13</td>
</tr>
<tr>
<td><strong>Winter</strong></td>
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<tr>
<td>CH 441</td>
<td>PHYSICAL CHEMISTRY</td>
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<tr>
<td>CHE 361</td>
<td>CHEMICAL PROCESS DYNAMICS AND SIMULATION</td>
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<td>CHE 312</td>
<td>CHEMICAL ENGINEERING THERMODYNAMICS</td>
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<td>CHE 332</td>
<td>TRANSPORT PHENOMENA II</td>
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<td>Perspective *</td>
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<td>3</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>15</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 442</td>
<td>PHYSICAL CHEMISTRY</td>
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<td>CHE 461</td>
<td>PROCESS CONTROL</td>
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<td>CHE 333</td>
<td>TRANSPORT PHENOMENA III</td>
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<td>CHE 334</td>
<td>TRANSPORT PHENOMENA LABORATORY</td>
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<td>Perspective *</td>
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<tr>
<td>Advanced Chemistry Elective</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>18</td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
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<td><strong>Fall</strong></td>
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<tr>
<td>CBE 414</td>
<td>*PROCESS ENGINEERING LABORATORY</td>
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</tbody>
</table>
Environmental Engineering Graduate Major (MENG, MS, PhD)

Graduate Areas of Concentration

Bioremediation, environmental fluid mechanics, environmental microbiology, environmental modeling, multiphase phenomena, subsurface flow and transport, water and wastewater treatment

The School of Chemical, Biological and Environmental Engineering offers graduate curricula leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees in Environmental Engineering. The ENVE program prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of systems for controlling contained living environments and for monitoring and controlling factors in the external natural environment. Specific application areas include pollution control, waste and hazardous material disposal, health and safety protection, conservation, life support, and requirements for protection of special materials and related work environments, as well as emerging areas including sustainability, detection and treatment of emerging contaminants and their fate in the natural environment, water supply for a growing world population, and mitigation of the effects of climate change, among others. All programs are tailored to individual student needs and professional goals. A diversity of faculty interests, broadened and reinforced by cooperation between the school and other engineering departments and schools and research centers on campus, make tailored individual programs possible.

For more information, contact the Graduate Programs Coordinator, School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis, OR 97331-2904, 541-737-0479 or email cbee-gradinfo@engr.orst.edu

Major Code: 3310

## MEng Degree

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBEE 507</td>
<td>SEMINAR (1 credit per term, 3 credits required)</td>
<td>3</td>
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<tr>
<td>CHE 525</td>
<td>CHEMICAL ENGINEERING ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 532</td>
<td>AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 535</td>
<td>PHYSICAL AND CHEMICAL TREATMENT PROCESSES</td>
<td>4</td>
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<tr>
<td>ENVE 536</td>
<td>AQUEOUS ENVIRONMENTAL CHEMISTRY LABORATORY</td>
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<tr>
<td>ENVE 541</td>
<td>MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS</td>
<td>4</td>
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</tbody>
</table>

**Electives**

Select at least one of the following:

- ENVE 525 | AIR POLLUTION CONTROL                          | 3     |
- ENVE 531 | FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS       | 3     |
- ENVE 556 | SUSTAINABLE WATER RESOURCES DEVELOPMENT          | 3     |

**Thesis**

- ENVE 503 | THESIS                                              | minimum 9 |

**Total Hours**

45

## MS Degree

<table>
<thead>
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<th>Hours</th>
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<tbody>
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<td>SEMINAR (1 credit per term, 3 credits required)</td>
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</tr>
<tr>
<td>CHE 525</td>
<td>CHEMICAL ENGINEERING ANALYSIS</td>
<td>4</td>
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<tr>
<td>ENVE 532</td>
<td>AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS</td>
<td>4</td>
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<tr>
<td>ENVE 535</td>
<td>PHYSICAL AND CHEMICAL TREATMENT PROCESSES</td>
<td>4</td>
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<tr>
<td>ENVE 536</td>
<td>AQUEOUS ENVIRONMENTAL CHEMISTRY LABORATORY</td>
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<td>ENVE 541</td>
<td>MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS</td>
<td>4</td>
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</table>

**Electives**

Courses approved by student’s MS Committee on Graduate Program of Study

15

**Thesis**

- ENVE 503 | THESIS                                              | minimum 9 |

**Total Hours**

45

## PhD Degree

<table>
<thead>
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<th>Title</th>
<th>Hours</th>
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</thead>
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<td>CBEE 507</td>
<td>SEMINAR (1 credit per term, 3 credits required)</td>
<td>3</td>
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<tr>
<td>CHE 525</td>
<td>CHEMICAL ENGINEERING ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 532</td>
<td>AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 535</td>
<td>PHYSICAL AND CHEMICAL TREATMENT PROCESSES</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 536</td>
<td>AQUEOUS ENVIRONMENTAL CHEMISTRY LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td>ENVE 541</td>
<td>MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS</td>
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**Electives**

Courses approved by student’s PhD Committee on Graduate Program of Study

16

**Thesis**

- ENVE 603 | THESIS                                              | minimum 36 |

**Total Hours**

108

## Prerequisite and Corequisite Course Work for Non-engineering Undergraduates

MEng, MS, or PhD students without undergraduate degrees in environmental engineering or a related engineering discipline must take the following courses in addition to the ENVE core:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CBEE 507</td>
<td>SEMINAR (1 credit per term, 3 credits required)</td>
<td>3</td>
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</tbody>
</table>

**Completion of the following required before taking ENVE core courses**
Math through differential equations
One year of general chemistry
One year of physics
CBEE 211 MATERIAL BALANCES AND STOICHIOMETRY
or CBEE 280 MATERIAL AND ENERGY BALANCES

Corequisite Courses
CE 547 WATER RESOURCES ENGINEERING I: PRINCIPLES OF FLUID MECHANICS 4
ENVE 521 DRINKING WATER TREATMENT PROCESSES 4
ENVE 522 WASTEWATER TREATMENT PROCESSES 4
ENVE 531 FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS 4

1 In addition to Graduate School mandated preliminary and final exams, PhD students in environmental engineering must successfully complete a qualifying exam, the details and timing of which can be found in the environmental engineering graduate student handbook
+ ENVE 521 and ENVE 522 will not count towards the credit requirements for the MEng, MS, and PhD degrees

Major Code: 3310

Environmental Engineering Graduate Minor

The Graduate Minor in Environmental Engineering is for masters and doctoral level students who seek additional formal training and mentoring in environmental engineering. Students pursuing a Minor in Environmental Engineering must include at least one Environmental Engineering faculty member on their committee. This faculty member must be engaged in the development of the student’s Program of Study and in the case of Doctoral students, their dissertation research; therefore, it is recommended that this faculty member be identified early in the doctoral program.

For more information, contact the Graduate Programs Coordinator, School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis, OR 97331-2904, 541-737-0479 or email cbee-gradinfo@engr.orst.edu

Minor Code: 3310

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>MS Minor</td>
<td>Courses selected in consultation with their Environmental Engineering Faculty Advisor (15 credits)</td>
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<tr>
<td>PhD Minor</td>
<td>Courses selected in consultation with their Environmental Engineering Faculty Advisor (18 credits)</td>
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Minor Code: 3310

Environmental Engineering Minor

Minor Code: 310

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>Core</td>
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<tr>
<td>CH 123</td>
<td>*GENERAL CHEMISTRY</td>
<td>5</td>
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<tr>
<td>or CH 233</td>
<td>GENERAL CHEMISTRY and LABORATORY FOR CHEMISTRY 233</td>
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<tr>
<td>&amp; CH 263</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVE 322</td>
<td>FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING</td>
<td>4</td>
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<tr>
<td>ENVE 421</td>
<td>DRINKING WATER TREATMENT PROCESSES</td>
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Electives
Select 11 credits from the following:
- ENVE 425 AIR POLLUTION CONTROL
- ENVE 456 SUSTAINABLE WATER RESOURCES DEVELOPMENT
- BEE 446 RIVER ENGINEERING
- BEE 458 NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL
- BEE 468 BIOREMEDIATION ENGINEERING
- CE 313 HYDRAULIC ENGINEERING
- CE 412 HYDROLOGY
- CE 417 HYDRAULIC ENGINEERING DESIGN

Total Hours 21

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
† Contact the School of Chemical, Biological and Environmental Engineering for questions about alternate elective courses

Minor Code: 310

Environmental Engineering Undergraduate Major (BA, BS, HBA, HBS)

The Bachelor of Science and Honors Bachelor of Science degrees in Environmental Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The ENVE program draws upon a strong foundation in the basic sciences and prepares students for environmental engineering careers in consulting, industry, and state and local governments. It is a rigorous program incorporating course work in civil and chemical engineering, water and wastewater treatment, hazardous substance management, air pollution, and environmental health. The concept of environmental engineering design is introduced during the freshman year, with most of the design skills developed at the junior and senior level. Training culminates in team-based solutions to open-ended, realistic problems that incorporate aspects of economics, process operation and maintenance, process stability and reliability, and consideration of constraints.

Alumni of the environmental engineering program will be work-ready engineers prepared with the knowledge and skills necessary to solve contemporary environmental engineering problems. Program educational objectives can be found on the school’s website (https://cbee.oregonstate.edu/enve-undergraduate-program/).

Student Outcomes for Environmental Engineering Programs
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The environmental engineering undergraduate curriculum is designed to meet these objectives through relevant course content, structured collaborative learning experiences, and hands-on laboratory and design experiences in the first year through senior levels. The school has a core curriculum where students from all three programs housed within the school (CHE, BIOE, ENVE) take common courses in the areas of first-year engineering, materials and energy balances, thermodynamics, transport phenomena, and senior year unit operations.

Environmental engineering students have opportunities to obtain internships offered through the School of CBEE, and through the College of Engineering Multiple Engineering Cooperative Program (MECOP). Many scholarships are available on a competitive basis for environmental engineering undergraduate students. More detailed descriptions of the curriculum and requirements may be viewed on the school’s website (https://cbee.oregonstate.edu/enve-undergraduate-program/).

Major Code: 311

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First Year</td>
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<tr>
<td>CBEE 101</td>
<td>CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION 1</td>
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<td>CBEE 102</td>
<td>ENGINEERING PROBLEM SOLVING AND COMPUTATIONS</td>
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<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231 1</td>
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<tr>
<td>CH 232</td>
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<tr>
<td>&amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 232 1</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
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<td>&amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233 1</td>
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<td>COMM 111</td>
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<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH 2</td>
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<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course) 2</td>
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<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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| Second Year     |                                                                       |       |
| CBEE 211        | MATERIAL BALANCES AND STOICHIOMETRY 1                                 | 3     |
| CBEE 212        | ENERGY BALANCES 1                                                    | 3     |
| CBEE 213        | PROCESS DATA ANALYSIS 1                                              | 4     |
| CH 331          | ORGANIC CHEMISTRY                                                    | 8     |
| & CH 332        | and ORGANIC CHEMISTRY                                               |       |
| ENGR 211        | STATICS                                                              | 3     |
| ENGR 212        | DYNAMICS                                                             | 3     |
| ENGR 213        | STRENGTH OF MATERIALS 1                                              | 3     |
| GEO 221         | *ENVIRONMENTAL GEOLOGY                                               | 4     |
|                 |                                                                      |       |
|                 | **Major Code: 311**                                                  |       |

**School of Civil and Construction Engineering**

The mission of the School of Civil and Construction Engineering is that of the College of Engineering (see college statement on mission and goals), as well as providing a comprehensive, state-of-the-art education to prepare students for professional and responsible engineering and constructor positions with business, industry, consulting firms, or government.

Education in the basic sciences occurs primarily in the freshman and sophomore years. Engineering science is introduced at the sophomore year and continues through to graduation with a combination of required
courses and technical electives. Completion of the OSU Baccalaureate Core provides experience in the humanities, social sciences, and other nontechnical areas as additional preparation for a student’s profession and life.

The CCE School offers an undergraduate option in environmental engineering that provides education in water pollution, air pollution, solid wastes, and hazardous wastes.

The growing complexity of modern engineering practice requires further specialization in one or more engineering disciplines. This is generally attained through postgraduate study. The CCE School offers MEng, MS, and PhD programs with concentrations in civil engineering, coastal and ocean engineering, construction engineering management, geomatics, geotechnical engineering, infrastructure materials, structural engineering, transportation engineering, and water resources engineering.

Areas of concentration may be combined to form an integrated civil engineering MS program, MEng program, or MEng, MS, and PhD minors.

The school also participates in the Master of Arts in Interdisciplinary Studies program.

**Undergraduate Programs**

**Majors**
- Architectural Engineering (p. 428)
- Civil Engineering (p. 430)
- Construction Engineering Management (p. 432)

**Graduate Programs**

**Major**
- Civil Engineering (p. 429)

**Minor**
- Civil Engineering (p. 430)

W. Jason Weiss, School Head  
Shane Brown, Associate Head for Undergraduate Affairs  
Merrick Haller, Associate Head for Graduate Affairs  

101 Kearney Hall  
Oregon State University  
Corvallis, OR 97331-3212  
Phone: 541-737-4934  
Email: cce@engr.orst.edu  
Website: http://cce.oregonstate.edu/

**Faculty**

Professors Ashford, Bell, Cox, Gambatese, Higgins, Istok, Liu, Ozkan-Haller, Schultz, Trejo, Yeh, Weiss, Yim  
Associate Professors Brown, Evans, Haller, Hill, Hunter-Zaworski, Isgor, Lundy, Miller, Ozkan-Haller, Parrish, Scott, Sillars  
Assistant Professors Arocho, Babbar-Sebens, Barbosa, Coleri, Borello, Gillins, Hernandez, Hurwitz, Ideker, Lee, Leon, Mason, Olsen, Park, Stuedlein, Wang  
Adjuncts Gupta, Sinha  
Senior Instructors Arras, Fradella  
Instructors Berger, Martin  
Academic Advisors Nave-Abele, Whitehead  

**Architectural Engineering**

ARE 301. ARE JUNIOR SEMINAR. (1 Credit)  
Professional practices of architectural engineering.

ARE 352. DESIGN OF ELECTRICAL AND ILLUMINATION SYSTEMS FOR BUILDINGS. (0-4 Credits)  
Design of electrical and illumination systems in buildings, including consideration of energy usage.  
**Prerequisites:** CEM 471 with C or better

ARE 353. DESIGN OF HVAC SYSTEMS FOR BUILDINGS. (4 Credits)  
Design and engineering of heating, ventilating, and air conditioning (HVAC) systems in buildings, including consideration of energy usage and indoor environmental conditions.  
**Prerequisites:** CEM 472 with C or better

ARE 418. *ARCHITECTURAL ENGINEERING PROFESSIONAL PRACTICE. (4 Credits)*  
Principles and methods of solving architectural engineering problems in a studio setting, with considerations of space, form, function, and technology. Lec/rec. (Writing Intensive Course)  
**Attributes:** CWIC – Core, Skills, WIC  
**Prerequisites:** ARE 351 with C or better and ARE 352 [C] and CE 382 [C]

ARE 419. *ARCHITECTURAL ENGINEERING DESIGN. (3 Credits)*  
A capstone design project experience exposing students to problems and issues similar to those encountered in the practice of architectural engineering. Use of Building Information Modeling (BIM) in design, construction management, and integration of architectural, structural, mechanical, electrical and lighting systems. Lec/rec. (Writing Intensive Course)  
**Attributes:** CWIC – Core, Skills, WIC  
**Prerequisites:** ARE 418 with C or better

ARE 451. ADVANCED BUILDING CONSTRUCTION METHODS. (4 Credits)  
Advanced building construction methods, including integration of building components in building envelopes. Lec/rec.  
**Prerequisites:** CEM 442 with C or better

ARE 499. SPECIAL TOPICS. (1-16 Credits)  
This course is repeatable for 16 credits.

ARE 501. RESEARCH. (1-16 Credits)  
This course is repeatable for 16 credits.

ARE 599. SPECIAL TOPICS. (1-16 Credits)  
This course is repeatable for 16 credits.

ARE 699. SPECIAL TOPICS. (1-16 Credits)  
This course is repeatable for 16 credits.
Civil Engineering

CE 199. SPECIAL TOPICS. (1-4 Credits)

CE 202. CIVIL ENGINEERING: GEOSPATIAL INFORMATION AND GIS. (3 Credits)
Introductory design principles presented with the use of GIS and geospatial information (remote sensing, GPS, surveying, and aerial photography) for civil engineering problem solving. Introduction to the integration of geospatial data and analysis for decision making and management for site selection, mitigation, change analysis, modeling and assessment. Standard software and custom programming used in course. Students participate in both individual and team projects and presentations. Projects from the area of civil engineering. Lec/lab. 
Prerequisites: CE 201 with C or better or CCE 201 with C or better or ENGR 248 with C or better

CE 299. SPECIAL TOPICS. (1-4 Credits)
Graded P/N.
Equivalent to: CE 299H

CE 299H. SPECIAL TOPICS. (1-4 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: CE 299

CE 301. CE JUNIOR SEMINAR. (1 Credit)
Professional practices of civil engineering.

CE 311. FLUID MECHANICS. (4 Credits)
Fluid properties, fluid statics, fluid motion, conservation of mass, momentum and energy for incompressible fluids, dimensional analysis, civil engineering applications. 
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and PH 213 [C] and ENGR 213 [C] and ENGR 212 [C]

CE 313. HYDRAULIC ENGINEERING. (4 Credits)
Analysis of large civil engineering fluid systems including conduit flow, multiple reservoirs, pipe networks, pumps, turbines, open channel flow, and hydraulic structures. 
Prerequisites: CE 311 with C or better or CHE 331 with C or better or CHE 331H with C or better

CE 361. SURVEYING THEORY. (4 Credits)
Use of surveying equipment, Gaussian error theory applied to measurements, calculations of position on spherical and plane surfaces, state plane coordinate systems, introduction to global positioning systems. 
Prerequisites: (CCE 201 with C or better or CE 202 with C or better) and ENGR 213 [C] and PH 213 [C] and ST 314 [C]

CE 365. HIGHWAY LOCATION AND DESIGN. (3 Credits)
Curve problems in highway design, including circular, vertical, compound curves and spirals; earth distribution analysis; preliminary office studies; paper location procedures and field layout problems. 
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 372. GEOTECHNICAL ENGINEERING I. (4 Credits)
Basic soil mechanics including the identification and classification of soil, principles of compaction and consolidation, flow through porous media, effective stress, and shear strength. Lec/lab. 
Prerequisites: ENGR 213 with C or better or ENGR 213H with C or better and (CE 311 (may be taken concurrently) [C] or CEM 311 (may be taken concurrently) [C] or CHE 331 (may be taken concurrently) [C] or CHE 331H (may be taken concurrently) [C]) and CH 201 [C] and PH 212 [C]

CE 373. GEOTECHNICAL ENGINEERING II. (4 Credits)
Application of fundamental soil mechanics principles to analyses of slope stability, retaining structures, and foundation support. Lec/rec. 
Prerequisites: CE 372 with C or better or FE 315 with C or better

CE 381. STRUCTURAL THEORY I. (4 Credits)
Analysis of statically determinate structures (beams, frames, trusses, arches, and cables). Approximate analysis, influence lines, deflections. 
Prerequisites: ENGR 213 with C or better or ENGR 213H with C or better

CE 382. STRUCTURAL THEORY II. (4 Credits)
Analysis of statically indeterminate structures (beams, frames, trusses). Deflections. Energy methods, introduction to matrix methods. 
Prerequisites: CE 381 with C or better and (MTH 306 [C] or MTH 306H [C] or (MTH 264 [C] and MTH 265 [C])

CE 383. DESIGN OF STEEL STRUCTURES. (4 Credits)
Introduction to design of steel members, connections and structural systems. Lec/lab. 
Prerequisites: CE 382 with C or better

CE 392. INTRODUCTION TO HIGHWAY ENGINEERING. (4 Credits)
Highway engineering standards, geometric design, cross section and roadside design, highway surfaces, pavement design, highways and the environment, highway construction and maintenance. 
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and CE 361 [C]

CE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 407. SEMINAR. (1-3 Credits)
Understanding complexity and systems thinking. 
Equivalent to: CE 407H
This course is repeatable for 16 credits.

CE 407H. SEMINAR. (1-3 Credits)
Understanding complexity and systems thinking. 
Attributes: HNRS – Honors Course Designator
Equivalent to: CE 407
This course is repeatable for 16 credits.

CE 408. WORKSHOP. (1-3 Credits)
This course is repeatable for 3 credits.

CE 410. INTERNSHIP. (1-12 Credits)
This course is repeatable for 16 credits.

CE 411. OCEAN ENGINEERING. (4 Credits)
Introduction to linear wave theory and wave forces on piles. Guided design of wave gauge facility at Coos Bay, Oregon, that requires synthesizing fluid mechanics, structural design and foundation design. 
Prerequisites: CE 313 with C or better or CEM 311 with C or better

CE 412. HYDROLOGY. (4 Credits)
Analysis of large civil engineering fluid systems including conduit flow, multiple reservoirs, pipe networks, pumps, turbines, open channel flow, and hydraulic structures. 
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and PH 213 [C] and ENGR 213 [C] and ENGR 212 [C]

CE 413. HYDRAULIC ENGINEERING. (4 Credits)
Analysis of large civil engineering fluid systems including conduit flow, multiple reservoirs, pipe networks, pumps, turbines, open channel flow, and hydraulic structures. 
Prerequisites: CE 311 with C or better or CHE 331 with C or better or CHE 331H with C or better

CE 414. INTRODUCTION TO LINEAR WAVE THEORY. (3 Credits)
Introduction to linear wave theory and wave forces on piles. Guided design of wave gauge facility at Coos Bay, Oregon, that requires synthesizing fluid mechanics, structural design and foundation design. 
Prerequisites: CE 313 with C or better or CEM 311 with C or better

CE 415. OCEAN MECHANICS. (4 Credits)
Analysis of large civil engineering fluid systems including conduit flow, multiple reservoirs, pipe networks, pumps, turbines, open channel flow, and hydraulic structures. 
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and PH 213 [C] and ENGR 213 [C] and ENGR 212 [C]
CE 413. GIS IN WATER RESOURCES. (3 Credits)
Course presents Geographic Information System (GIS) technology for developing solutions to water resource problems: water quality, availability, flooding, the natural environment, and management of water resources. Typical GIS data models for hydrologic information are presented. Synthesis of geospatial and temporal water resources to support hydrologic analysis and modeling are covered.
Recommended: Senior standing or a previous introductory GIS course

CE 415. COASTAL INFRASTRUCTURE. (3 Credits)
Planning and design criteria of coastal infrastructure, including breakwaters, jetties, sea walls, groins, piers, submerged pipelines, harbor design, and tsunami defense. Use of laboratory models, numerical simulations, and field observations for design.
Prerequisites: CE 313 with C or better

CE 417. HYDRAULIC ENGINEERING DESIGN. (4 Credits)
Theory, planning, analysis, and design of hydraulic structures. Application of basic principles detailed analysis and design. Engineering planning and design of water resource systems.
Prerequisites: CE 313 with C or better

CE 418. *CIVIL ENGINEERING PROFESSIONAL PRACTICE. (3 Credits)
Engineering career paths; ethics and professionalism, project planning, execution and delivery; team building/management; marketing proposals; engineering oversights; dispute resolution; partnering; effective decision making; uncertainty and risk analysis; and current industry design and construction methods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CE 382 with C or better and CE 313 [C] and (CE 372 [C] or FE 315 [C])
Equivalent to: CE 454

CE 419. *CIVIL INFRASTRUCTURE DESIGN. (3 Credits)
A capstone design project experience exposing students to problems and issues similar to those encountered in the practice of civil engineering. Students should have completed ALL other required courses in their degree program prior to registering for this course. Lec/rec.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CE 418 with C or better

CE 420. ENGINEERING PLANNING. (4 Credits)
The application of systems analysis to structuring, analyzing, and planning for civil engineering projects. Concept of the system and its environment; setting goals, objectives, and standards; evaluation criteria; solution generation and analysis; evaluation and optimization. Project management using precedence node diagramming; resource allocation and leveling; time-cost trade-off; and PERT.

CE 424. CONTRACTS AND SPECIFICATIONS. (4 Credits)
Fundamentals of construction industry contracts, including technical specifications, and issues related to time, money, warranty, insurance, and changed conditions.
Prerequisites: CEM 442 with C or better

CE 427. TEMPORARY CONSTRUCTION STRUCTURES. (4 Credits)
Design and construction of temporary structures including formwork, shoring, and earth retaining structures.
Prerequisites: (CE 321 with C or better or CCE 321 with C or better) and (FE 315 [C] or CE 372 [C]) and (CEM 383 [C] or CE 383 [C])

CE 428. PROJECT MANAGEMENT FOR CIVIL ENGINEERS. (4 Credits)
Provides the prospective civil engineer with the technical knowledge and familiarity necessary to successfully and confidently manage projects of different sizes and complexity levels. It relies on basic knowledge and techniques developed by the Project Management Institute (PMI) and real-world examples (through lectures, example projects, case studies, and guest speakers) from the public and private sectors.

CE 429. OPTIMIZATION IN WATER RESOURCES ENGINEERING. (3 Credits)
Introduction to problem formulation and optimization techniques for design of complex water resources systems.
Recommended: CE 412

CE 461. PHOTOGRAMMETRY. (3 Credits)
Geometry of terrestrial and vertical photographs, flightline planning, stereoscopy and parallax, stereoscopic plotting instruments, analytical photogrammetry, orthophotography, introduction to photo interpretation, and aerial cameras.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 463. CONTROL SURVEYING. (4 Credits)
Global Positioning Systems (GPS) theory, networks, and fieldwork; control specifications, methods and problems in obtaining large area measurements; precise leveling; network adjustments using least square techniques; field instrument adjustments.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 465. OREGON LAND SURVEY LAW. (3 Credits)
Introduction to U.S. public land survey; Oregon state statutes, common law decisions, and administrative rules dealing with boundary law; case studies; unwritten land transfers; original and resurvey platting laws; guarantees of title; deed descriptions.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 469. PROPERTY SURVEYS. (3 Credits)
U.S. public land survey restoration of corners, subdivision of sections; topographic mapping; subdivision and partition plats, resurvey plats, subdivision design; introduction to LIS/GIS; field astronomy.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 471. FOUNDATIONS FOR STRUCTURES. (3 Credits)
Criteria, theory, design, and construction for foundations of structures; use of in-situ tests for geotechnical engineering; computer applications.
Prerequisites: CE 373 with C or better or FE 316 with C or better

CE 479. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSLISTED as CE 479/FE 479 and CE 579/FE 579.
Prerequisites: CE 373 with C or better or FE 316 with C or better
Equivalent to: FE 479

CE 481. REINFORCED CONCRETE I. (4 Credits)
Basic principles of reinforced concrete design; strength, stability, and serviceability criteria; design of reinforced concrete members for flexure and shear. Detailing, development length and splices.
Prerequisites: CE 382 with C or better
CE 482. MASONRY DESIGN. (3 Credits)
A critical examination in depth of masonry design topics.
Prerequisites: CE 481 with C or better

CE 484. WOOD DESIGN. (4 Credits)
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab.
Prerequisites: CE 383 with C or better or CE 481 with C or better
Equivalent to: WSE 458

CE 486. PRESTRESSED CONCRETE. (3 Credits)
Prestressed concrete analysis and design, systems of prestressing, materials, economics.
Prerequisites: CE 481 with C or better

CE 489. SEISMIC DESIGN FUNDAMENTALS. (3 Credits)
Fundamentals of earthquake engineering, introduction to structural dynamics principles, response spectra, and ASCE 7 design and analysis provisions.
Prerequisites: CE 481 with C or better and CE 383 [C-]

CE 491. TRANSPORTATION ENGINEERING. (3 Credits)
Introduction to transportation engineering systems characteristics, traffic estimation, comprehensive transportation planning, highway economics, driver and vehicle characteristics, highway operations and capacity, signalization and control. Introduction to intelligent transportation.
Prerequisites: CE 392 with C or better and ST 314 [C]

CE 492. PAVEMENT STRUCTURES. (3 Credits)
Design and rehabilitation of pavement structures for streets, highways, and airports.
Prerequisites: CE 392 with C or better

CE 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

CE 508. WORKSHOP. (1-3 Credits)
Graded P/N.
This course is repeatable for 3 credits.

CE 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CE 511. OCEAN ENGINEERING. (4 Credits)
Introduction to linear wave theory and wave forces on piles. Guided design of wave gauge facility at Coos Bay, Oregon, that requires synthesizing fluid mechanics, structural design and foundation design.
Recommended: CE 313 or CEM 311

CE 512. HYDROLOGY. (4 Credits)
Fundamentals of hydrology, the hydrologic cycle, precipitation, streamflow, hydrograph analysis and hydrologic measurements.

CE 513. GIS IN WATER RESOURCES. (3 Credits)
Course presents Geographic Information System (GIS) technology for developing solutions to water resource problems: water quality, availability, flooding, the natural environment, and management of water resources. Typical GIS data models for hydrologic information are presented. Synthesis of geospatial and temporal water resources to support hydrologic analysis and modeling are covered.
Recommended: Senior standing or a previous introductory GIS course

CE 514. GROUNDWATER HYDRAULICS. (4 Credits)
Principles of groundwater flow and chemical transport in confined and unconfined aquifers, aquifer testing and well construction. Design of dewatering and contaminant recovery systems.
Prerequisites: CE 547 with B or better
Equivalent to: BEE 514
Recommended: CE 313 and MTH 252

CE 515. COASTAL INFRASTRUCTURE. (3 Credits)
Planning and design criteria of coastal infrastructure, including breakwaters, jetties, sea walls, groins, piers, submerged pipelines, harbor design, and tsunami defense. Use of laboratory models, numerical simulations, and field observations for design.
Recommended: CE 313

CE 516. STORMWATER DESIGN AND MANAGEMENT. (4 Credits)
Introduction to urban stormwater drainage systems; urban hydrologic analysis; water quality in urban storm water; design of stormwater control systems; low impact development; storm water monitoring; and computer modeling of urban storm water systems.
Prerequisites: CE 512 with C or better or BEE 512 with C or better

CE 517. HYDRAULIC ENGINEERING DESIGN. (4 Credits)
Theory, planning, analysis, and design of hydraulic structures. Application of basic principles detailed analysis and design. Engineering planning and design of water resource systems.
Recommended: CE 313

CE 518. GROUNDWATER MODELING. (4 Credits)
Application of numerical methods to the solution of water flow and solute transport through saturated and unsaturated porous media. Analysis of confined and unconfined aquifers. Computer solution of large-scale field problems including groundwater contamination and aquifer yield.
Prerequisites: CE 514 with C or better

CE 520. ENGINEERING PLANNING. (4 Credits)
The application of systems analysis to structuring, analyzing, and planning for civil engineering projects. Concept of the system and its environment; setting goals, objectives, and standards; evaluation criteria; solution generation and analysis; and evaluation and optimization. Project management using precedence node diagramming; resource allocation and leveling; time-cost trade-off; and PERT.

CE 524. CONTRACTS AND SPECIFICATIONS. (4 Credits)
Fundamentals of construction industry contracts, including technical specifications, and issues related to time, money, warranty, insurance, and changed conditions.

CE 525. STOCHASTIC HYDROLOGY. (3 Credits)
Introduction to fundamental concepts that are needed for stochastic modeling of hydrologic processes in presence of nonstationarity and uncertainty. CROSSLISTED as BEE 525/CE 525.
Prerequisites: CE 512 with C or better or BEE 512 with C or better
Equivalent to: BEE 525
CE 526. ADVANCED CONCRETE MATERIALS. (3 Credits)
Cement hydration, supplementary cementing materials, micro to macro scale property development, mixture design and proportioning including material selection for sustainable design practices, durability aspects including freeze-thaw attack, corrosion of reinforcing steel, sulfate attack and alkali-silica reaction, recent advances in concrete technology.
Recommended: CE 321 or CCE 321

CE 527. TEMPORARY CONSTRUCTION STRUCTURES. (4 Credits)
Design and construction of temporary structures including formwork, shoring, and earth retaining structures.
Recommended: (CE 321 or CCE 321) and (FE 315 or CE 372) and (CEM 383 or CE 383)

CE 528. PROJECT MANAGEMENT FOR CIVIL ENGINEERS. (4 Credits)
Provides the prospective civil engineer with the technical knowledge and familiarity necessary to successfully and confidently manage projects of different sizes and complexity levels. It relies on basic knowledge and techniques developed by the Project Management Institute (PMI) and real-world examples (through lectures, example projects, case studies, and guest speakers) from the public and private sectors.

CE 529. OPTIMIZATION IN WATER RESOURCES ENGINEERING. (3 Credits)
Introduction to problem formulation and optimization techniques for design of complex water resources systems.
Recommended: CE 512 or BEE 512

CE 530. SELECTED TOPICS IN STRUCTURAL ANALYSIS AND MECHANICS. (3 Credits)
A critical, in-depth examination of topics selected by the instructor from among topics not covered in other structural analysis and mechanics courses.
Prerequisites: CE 585 with C or better
This course is repeatable for 16 credits.

CE 531. STRUCTURAL MECHANICS. (3 Credits)
Theories of failure, multi-axial stress conditions, torsion, shear distortions, energy methods of analysis, beams on elastic foundations. Nonlinear and inelastic behavior.

CE 532. FINITE ELEMENT ANALYSIS. (4 Credits)
Applications of the finite element method to structural analysis, fluid flow and elasticity problems. Use and development of large finite element computer programs.
Prerequisites: (CE 585 with C or better or ME 520 with C or better)

CE 533. STRUCTURAL STABILITY. (3 Credits)
Stability theory and applications, with emphasis on design of steel structures.
Recommended: CE 383

CE 534. STRUCTURAL DYNAMICS. (4 Credits)
Analytical and numerical solutions for single, multi-degree of freedom and continuous vibrating systems. Behavior of structures, dynamic forces and support motions. Seismic response spectra analysis.
Recommended: CE 382

CE 535. INTRODUCTION TO RANDOM VIBRATIONS. (4 Credits)
Introduction to probability theory and stochastic processes. Correlation and spectral density functions. Response of linear systems to random excitations. First excursion and fatigue failures. Applications in structural and mechanical system analysis and design.
Prerequisites: CE 534 with C or better or ME 522 with C or better

CE 536. MATRIX METHODS OF STRUCTURAL ANALYSIS. (4 Credits)
Equivalent to: CE 585
Recommended: CE 382 with a minimum grade of C

CE 537. NONLINEAR STRUCTURAL ANALYSIS. (4 Credits)

CE 538. STRUCTURAL RELIABILITY AND RISK ANALYSIS. (4 Credits)
Application of probability and statistics in the reliability-based analysis and design of civil and mechanical engineering systems. Probabilistic modeling of loading and resistance including load and resistance factor design. Introduction to risk analysis and robustness.
Prerequisites: (CE 536 with C or better or ME 520 with C or better)
Recommended: ST 314

CE 540. SPECIAL TOPICS IN HYDRAULIC ENGINEERING. (3-4 Credits)
Introduction to the tools and methods employed to characterize hydrologic properties of subsurface systems. Hands-on use of GPR, TDR, resistivity, and methods of determining hydraulic conductivity, sorptivity, bulk density, and other fundamental hydrologic properties.
Equivalent to: BRE 540
This course is repeatable for 16 credits.

CE 543. APPLIED HYDROLOGY. (4 Credits)
Advanced treatment of hydrology covering major components of the hydrological cycle with special emphasis on surface water; hydrologic analysis and design of water resource systems; runoff prediction; and simulation of surface water systems. Offered alternate years.
Equivalent to: BRE 543
Recommended: BEE 512 and CE 412

CE 544. OPEN CHANNEL FLOW. (3 Credits)
Steady, uniform, and nonuniform flow in natural and artificial open channels; unsteady flow; interaction of flow with river structures; and computational methods.
Equivalent to: BEE 544, BRE 544
Recommended: (CE 311 and CE 313) or CE 547

CE 547. WATER RESOURCES ENGINEERING I: PRINCIPLES OF FLUID MECHANICS. (4 Credits)
Fluid mechanics for water resources engineers, classifications of fluid flows; fluid statics and dynamics, incompressible viscous flows; dimensional analysis; applications to fluid machinery, flow through porous media, fluid motion in rivers, lakes, oceans.

CE 548. WATER QUALITY DYNAMICS. (3 Credits)
Mass balance, advection and diffusion in streams, lakes and estuaries; thermal pollution, heat balance, oxygen balance, and eutrophication; mathematical models; and numerical solutions.

CE 551. COMPUTER-AIDED SITE AND ROAD DESIGN. (4 Credits)
Site development and road design principles and application to a comprehensive design project using computer-based digital terrain model software tools. Lec/lab/rec.
Recommended: Completion or concurrent enrollment in CE 392
CE 552. ISOLATED SIGNALIZED INTERSECTIONS. (3 Credits)
Relationships between signal display, user response, vehicle detection, and signal timing parameters are examined in detail. Traffic simulation is introduced to visualize and design the various elements of isolated signalized intersections.
Recommended: CE 595

CE 553. RAILROAD ENGINEERING. (3 Credits)
The principal subject of this course is the railway infra-structure and operational issues related to high speed passenger rail and freight rail (class 1 and regional rail). The course will cover the techniques used to design, construct, monitor and maintain railway track. Class will include field trips.
Corequisites: CE 392

CE 554. DRIVING SIMULATION. (3 Credits)
Relationships between the functional elements of driving simulation (simulation computer processing, sensory feedback generation, sensory display devices, and the human operator) are examined in detail. The role of driving simulation in transportation engineering research and practice is also considered in depth. Students will design experiments, analyze and interpret data, and extrapolate simulator results to real-world scenarios.
Recommended: CE 595

CE 556. TRANSPORTATION SAFETY ANALYSIS. (3 Credits)
Provides students with a general knowledge of major transportation safety issues and a general background in the application of various statistical and econometric safety analysis techniques. In addition, this course presents a number of model-estimation methods used in transportation safety data analysis, and other subject areas that deal with safety analysis.
Recommended: CE 392 with a minimum grade of C and ST 511

CE 557. NETWORK FLOW ANALYSIS AND OPTIMIZATION. (3 Credits)
Acquaints students with the basic elements of operations research through transportation networks, optimal paths in transportation networks, vehicle routing and scheduling problems on networks, facility location problems, transportation network design problems, transportation network flow, and to indicate the directions for future research in this area. Although the course utilizes examples from transportation, the techniques and models are generalizable to other areas of engineering, e.g., water networks, computer networks, energy networks, agricultural, power, telecommunication, etc.
Recommended: CE 392 with a minimum grade of C

CE 560. SELECTED TOPICS IN GEOMATICS ENGINEERING. (0-4 Credits)
Selected topics on contemporary problems in geomatics engineering; application of ongoing research from resident and visiting faculty. This course is repeatable for 16 credits.

CE 561. PHOTOGRAMMETRY. (3 Credits)
Geometry of terrestrial and vertical photographs, flightline planning, stereoscopy and parallax, stereoscopic plotting instruments, analytical photogrammetry, orthophotography, introduction to photo interpretation, and aerial cameras.
Recommended: CE 361 or CEM 263 or FE 208

CE 562. DIGITAL TERRAIN MODELING. (4 Credits)
Fundamentals of LiDAR and creating digital terrain models. Computational geometry, Delaunay triangulations, spline interpolations, statistical gridding methods, ground filtering, data optimizations, and advanced topics in 3D modeling.
Recommended: CE 361 or CEM 263 or equivalent surveying or GIS course.

CE 563. CONTROL SURVEYING. (4 Credits)
Global Positioning Systems (GPS) theory, networks, and fieldwork; control specifications, methods and problems in obtaining large area measurements; precise leveling; network adjustments using least square techniques; field instrument adjustments.
Recommended: CE 361 or CEM 263 or FE 208

CE 564. GLOBAL NAVIGATION SATELLITE SYSTEM. (4 Credits)
Theories and applications of surveying using satellites, focusing on the use of Global Navigation Satellite System (GNSS). The course will begin with the comprehensive overviews of the GNSS, reference and time systems as well as basic orbital mechanics. A description of the satellite signals and the data collected by GNSS receivers will also be covered. Different positioning and navigation techniques for using GNSS data (absolute/relative positioning, static/kinematic positioning, standalone/network based positioning) and different user applications will be reviewed, followed by practices of data collections and processing techniques.
Recommended: CE 361 or CE 202

CE 565. OREGON LAND SURVEY LAW. (3 Credits)
Introduction to U.S. public land survey; Oregon state statutes, common law decisions, and administrative rules dealing with boundary law; case studies; unwritten land transfers; original and resurvey platting laws; guarantees of title; deed descriptions.
Recommended: CE 361 or CEM 263 or FE 208

CE 566. 3D LASER SCANNING AND IMAGING. (4 Credits)
Fundamentals of lidar acquisition, registration, processing, modeling, analysis, and verification. Use of sensor platforms for 3D acquisition. Effective data management procedures. Introduction to other imaging techniques including structure from motion and structured light. Lec/lab.

CE 567. COASTAL REMOTE SENSING. (4 Credits)
Application of remote sensing technologies (e.g., unmanned aircraft systems, multi- and hyperspectral imagery, high-resolution commercial satellite imagery, synthetic-aperture radar, and topographic and bathymetric lidar) to coastal mapping and charting, coastal engineering and coastal zone management. Both the theory and applications of advanced remote sensing technologies are covered. Lec/lab.
Recommended: An undergraduate surveying course, such as CE 361, CEM 263 or FE 208 and some exposure to MATLAB

CE 568. LEAST SQUARES ADJUSTMENTS. (3 Credits)
Examines the theory of random error and statistical testing. Discusses the propagation of error in both indirect observations and direct observations from survey. Studies weights of observations and the principles of least squares. Explains how to adjust redundant observations in level nets, horizontal surveys, GNSS networks, and GNSS and terrestrial survey networks by least squares. Estimates the error ellipses of the adjusted observations. Evaluates methods for performing coordinate transformations.
Recommended: CE 361 or CEM 263 or FE 208

CE 569. PROPERTY SURVEYS. (3 Credits)
U.S. public land survey; restoration of corners, subdivision of sections; topographic mapping; subdivision and partition plats, resurvey plats, subdivision design; introduction to LIS/GIS; field astronomy.
Recommended: CE 361 and CEM 263 or FE 208

CE 570. GEOTECHNICAL SPECIAL TOPICS. (1-16 Credits)
Development and management of actual projects through the examination of case histories; evaluation of geotechnical data; development of design recommendations and preparation of project reports.
Recommended: CE 361 or CEM 263 or equivalent surveying or GIS course.
This course is repeatable for 16 credits.
CE 571. ADVANCED FOUNDATION ENGINEERING. (4 Credits)
Prepares the planning, analysis, and design of shallow and deep foundations from the geotechnical engineering perspective. Topics supporting course objectives include planning and execution of subsurface investigations, interpretation of in-situ tests, analysis, and design of deep and shallow foundations, including geotechnical capacity, and immediate settlement. Assessment of deep foundation installation, axial and lateral loading tests, and group effects is presented. Evaluation of foundation performance is conducted under deterministic and probabilistic frameworks.
Recommended: CE 373 and CE 471

CE 572. ADVANCED GEOTECHNICAL LABORATORY. (4 Credits)
Examines soil composition and engineering properties of soils including volume change, pore pressure generation, strength, and deformation behavior of soils in the laboratory. Advanced static and cyclic shear strength testing of soils will also be discussed. Lec/lab.
Recommended: CE 373 and CE 471

CE 574. ENGINEERING PROPERTIES OF SOILS. (5 Credits)
Presents the theory and practice of design and construction of earth retaining structures. Topics include rigid and flexible retaining structures, ranging from gravity and cantilever systems, cantilever and anchored sheet piling, tied-back shoring elements, soil nailing, and mechanically stabilized earth walls. These topics are developed with a view on compaction stresses and surface loading, and invokes approaches that range from the static equations of equilibrium to empirical rules of thumb.
Recommended: CE 471

CE 575. EARTH RETENTION AND SUPPORT. (4 Credits)
Provides the planning, analysis, and design of ground improvement techniques. Topics supporting course objectives include design for accelerated settlement (surchage design) with and without prefabricated vertical drains, vibro-compaction, vibro-replacement (stone columns) and aggregate piers, deep soil mixing, jet grouting, EPS geofoam, and other improvement techniques for improving soil strength and stability, and limiting deformations and the effects of liquefaction.
Prerequisites: CE 572 with C or better and CE 577 (C)

CE 577. STATIC AND DYNAMIC SOIL BEHAVIOR. (3 Credits)
An advanced coverage of volume change and strength behavior of soil. Specific course topics include effective stress, one-dimensional compression of soil, rate of soil consolidation, Mohr circle analysis, shear strength of sands, clays, and silts, and dynamic soil properties, strength, and testing.
Recommended: CE 372 and CE 373

CE 578. GEOTECHNICAL EARTHQUAKE ENGINEERING. (4 Credits)
Major course topics include engineering seismology, strong ground motion, seismic hazard analysis, soil dynamics, seismic site response, earthquake motion selection, liquefaction, and seismic slope stability. Attention will be given to earthquakes created by the Cascadia Subduction Zone. Lec/lab.
Recommended: CE 373 and CE 471

CE 579. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSLISTED as CE 479/FE 479 and CE 579/FE 579.
Equivalent to: FE 579
Recommended: CE 373 or FE 316

CE 580. SELECTED TOPICS IN STRUCTURAL DESIGN. (3 Credits)
A critical examination in depth of topics selected by the instructor from among topics not covered in other structural design courses. This course is repeatable for 18 credits.

CE 581. REINFORCED CONCRETE I. (4 Credits)
Basic principles of reinforced concrete design; strength, stability, and serviceability criteria; design of reinforced concrete members for flexure and shear. Detailing, development length and splices.
Recommended: CE 382

CE 582. MASONRY DESIGN. (3 Credits)
A critical examination in depth of masonry design topics.
Recommended: CE 581

CE 583. BRIDGE DESIGN. (3 Credits)
AASHTO specifications for bridge design; load models; design for moving loads; design and analysis of bridge decks and simple and continuous steel spans.
Recommended: Completion of CE 381 and CE 382 and (CE 481 or CE 581) and concurrent enrollment in CE 383

CE 584. WOOD DESIGN. (4 Credits)
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab. CROSSLISTED as CE 584/WSE 558.
Equivalent to: WSE 558
Recommended: CE 383 or CE 381 with a minimum grade of C

CE 586. PRESTRESSED CONCRETE. (3 Credits)
Prestressed concrete analysis and design, systems of prestressing, materials, economics.
Recommended: CE 581

CE 589. SEISMIC DESIGN. (4 Credits)
Design of structures to resist the effects of earthquakes. Introduction to structural dynamics, dynamic analysis, seismic design philosophy, code requirements, and detailing for steel and reinforced concrete.
Recommended: CE 383 or CE 481

CE 590. SELECTED TOPICS IN TRANSPORTATION ENGINEERING. (1-3 Credits)
Selected topics on contemporary problems in transportation engineering, application of ongoing research from resident and visiting faculty. This course is repeatable for 9 credits.

CE 591. TRANSPORTATION SYSTEMS ANALYSIS, PLANNING, AND POLICY. (3 Credits)
CE 592. PAVEMENT STRUCTURES. (3 Credits)
Design and rehabilitation of pavement structures for streets, highways, and airports.
Recommended: CE 392

CE 593. TRAFFIC FLOW ANALYSIS AND CONTROL. (4 Credits)
Traffic operations and control systems; traffic flow theory and stream characteristics; capacity analysis; traffic models and simulation; accident and safety improvement. Offered alternate years.

CE 594. TRANSPORT FACILITY DESIGN. (4 Credits)
Location and design of highways, and other surface transportation terminals; design for safety, energy efficiency, and environmental quality. Offered alternate years. Lec/rec.
Recommended: CE 392

CE 595. TRAFFIC OPERATIONS AND DESIGN. (3 Credits)
Traffic operations and engineering; human and vehicular characteristics; traffic stream characteristics; highway capacity analysis; intersection operation, control and design.
Recommended: Completion or concurrent enrollment in CE 491

CE 596. PAVEMENT EVALUATION AND MANAGEMENT. (3 Credits)
Advanced topics in pavement evaluation techniques and pavement management procedures.
Recommended: CE 492

CE 597. PUBLIC TRANSPORTATION. (3 Credits)
Characteristics and nature of public transportation systems, including bus, light and heavy rail; financing policy considerations; planning transit service; managing and operating transit systems for small and large urban areas. Offered alternate years.

CE 598. AIRPORT PLANNING AND DESIGN. (3 Credits)
Characteristics and nature of the air transport system, Airport financing, air traffic control. Analysis and design of airports and the airport planning processes. Airport appurtenances. Airport pavement design, environmental facilities and drainage. Offered alternate years.

CE 599. INTELLIGENT TRANSPORTATION SYSTEMS. (3 Credits)
Introduction to intelligent transportation systems, including enabling surveillance, navigation, communication and computer technologies. Application of technologies for monitoring, analysis evaluation and prediction of transportation system performance. Intervention strategies, costs and benefits, safety, human factors, institutional issues and case studies. Offered alternate years.
Recommended: CE 491 for new graduate students

CE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 607. OCEAN ENGINEERING SEMINAR. (1 Credit)
Presentations from on-campus and off-campus speakers discussing state of technology topics in ocean engineering research, development, and construction. Graded P/N.
This course is repeatable for 16 credits.

CE 630. OCEAN WAVE MECHANICS I. (3 Credits)
Linear wave boundary value problem formulation and solution, water particle kinematics, shoaling, refraction, diffraction, and reflection. Linear long wave theory with applications to tides, seiching, and storm surge. CROSSLISTED as CE 630/OC 630.
Equivalent to: OC 630

CE 631. OCEAN WAVE MECHANICS II. (3 Credits)
Second in the sequence of ocean wave engineering mechanics, covers the following topics: introduction to long wave theory, wave superposition, wave height distribution, and the wind-wave spectrum, introduction to wave forces, and basic nonlinear properties of water waves. May include additional selected topic in wave mechanics. CROSSLISTED as CE 631/OC 631.
Prerequisites: (CE 630 with C or better or OC 630 with C or better)
Equivalent to: OC 631

CE 634. LONG WAVE MECHANICS. (3 Credits)
Theory of long waves. Depth-integrated Euler's equation and its jump conditions. Evolution equations and their solutions. Nonlinear shallow-water waves, the Korteweg-deVries equation and Boussinesq equation. Boundary-layer effects. Shallow-water waves on beaches. Applications of the fundamentals to problems of tsunamis. CROSSLISTED as CE 634/OC 634.
Prerequisites: (CE 630 with C or better and CE 631 [C])
Equivalent to: OC 634
Recommended: OC 670

CE 635. APPLIED MODELING OF NEARSHORE PROCESSES. (4 Credits)
An introduction to numerical modeling of the nearshore ocean, providing hands-on experience with state-of-the-art numerical models for wave propagation, nearshore circulation, planform shoreline evolution and bathymetric profile evolution. The focus is on review of model requirements, detailed study of several specific models for several domains of interest, application to coastal phenomena, and the interpretation of model results. Offered alternate years. CROSSLISTED as CE 635/OC 635.
Equivalent to: OC 635

CE 639. DYNAMICS OF OCEAN STRUCTURES. (3 Credits)
Dynamic response of fixed and compliant structures to wind, wave and current loading: Morison equation and diffraction theory for wave and current load modeling, time and frequency domain solution methods; application of spectral and time series analyses; system parameter identification; and stochastic analysis of fatigue and response to extreme loads. Offered alternate years.

CE 640. SELECTED TOPICS IN OCEAN AND COASTAL ENGINEERING. (1-3 Credits)
Selected topics on contemporary problems in ocean and coastal engineering; application of ongoing research from resident and visiting faculty. Offered alternate years. This course is repeatable for 9 credits.
Recommended: CE 630

CE 642. RANDOM WAVE MECHANICS. (3 Credits)
Random wave theories, probability and statistics of random waves and wave forces, time series analyses of stochastic processes, ocean wave spectra. Offered alternate years. Prerequisites: CE 630 with C or better
CE 643. COASTAL ENGINEERING. (3 Credits)
Coastal sediment transport including nearshore currents, longshore onshore-offshore transport, and shoreline configuration; equilibrium beach profile concept with application to shore protection; shoreline modeling; tidal inlet hydrodynamics and inlet stabilization; design criteria for soft structures. Offered alternate years.
Prerequisites: CE 630 with C or better

CE 645. WAVE FORCES ON STRUCTURES. (3 Credits)
Wave forces on small and large members, dimensional analyses and scaling of equations, identification and selection of force coefficients for Morison equation; compatibility of wave kinematics and force coefficients in Morison equation; diffraction and radiation of surface gravity waves by large floating bodies, wavemaker problem, and reciprocity relations.
Prerequisites: CE 630 with C or better

CE 647. OCEAN AND COASTAL ENGINEERING MEASUREMENTS. (3 Credits)
Hands-on experience in the conduct of field and laboratory observations, including waves, currents, wind, tides, tsunamis, sediments, bathymetry, shore profiles, wave forces on structures, and structural response. Online data archival and retrieval systems.
Prerequisites: CE 630 with C or better

CE 661. KINEMATIC POSITIONING AND NAVIGATION. (3 Credits)
Application of Global Navigation Satellite System (GNSS) aided Inertial Navigation Systems (INS) to directly georeference survey data acquired from a moving platform, such as an unmanned aircraft system (UAS), conventional aircraft, survey boat, or all-terrain vehicle. Topics include 3D coordinate transformations, dead-reckoning, inertial navigation, kinematic GNSS, Kalman filtering, and sensor modeling.
Recommended: Undergraduate surveying course, such as CE 361, CE 263 or FE 208, and some exposure to MATLAB

CE 663. GEODESY. (4 Credits)
Covers the geometrical aspects of terrestrial and celestial reference systems as well as modern realizations of these coordinate systems. In addition, an introductory level of the physical geodesy is also included, such as gravitational and gravity fields in order to deal with the geoid and heights. From this course, students are expected to understand the core elements of geometric and physical earth, which will assist them to have a solid background for other geospatial related studies.
Recommended: CE 202 or CE 361

CE 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Civil and Construction Engineering

CCE 101. CIVIL AND CONSTRUCTION ENGINEERING ORIENTATION. (2 Credits)
Introduction to civil and construction engineering professions; problem solving, communication skills. This course is required by the CE, CEM and FE programs.
Equivalent to: CE 101
Recommended: MTH 111 and completion or concurrent enrollment in MTH 112 or MTH 251

CCE 102. CIVIL AND CONSTRUCTION ENGINEERING: PROBLEM-SOLVING AND TECHNOLOGY. (3 Credits)
A skills-based course that focuses on introducing freshman students to the use of hand calculation and computer technology in solving civil engineering and construction engineering problems. Topics to be covered include structured approach to problem solving, use of Excel for engineering applications, internet tools and data bases, homework professionalism. Opportunities for involvement with ASCE and AGC student chapters. Lec/lab.
Equivalent to: CE 102
Recommended: Completion or concurrent enrollment in MTH 112 or MTH 251

CCE 201. CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN. (3 Credits)
Introduces the engineering design process and graphic skills that are used by civil and construction engineers. Topics include design process, geometric construction, multiviews, auxiliary views, sections, dimensioning, tolerances and engineering drawing standards. Students participate in team design projects and presentations. Graphic and design projects from the areas of civil and construction engineering. Lec/lab.
Prerequisites: MTH 111 with C or better or MTH 112 (may be taken concurrently) with C or better or MTH 241 (may be taken concurrently) with C or better
Equivalent to: CE 201

CCE 203. INTRODUCTION TO VIRTUAL DESIGN AND CONSTRUCTION. (3 Credits)
Basic principles of virtual design and construction (VDC) focusing on skills required for generating design and construction information models. Parametric modeling and design constraints are introduced. Students will utilize construction drawings and documentation to create accurate 3D models. Use of design and construction information models for making estimates of quantities and cost, and for determination of constructability problems. Lec/lab.
Prerequisites: CCE 201 with C or better or ENGR 248 with C or better

CCE 207. CCE SEMINAR. (1 Credit)
Professional practices of civil and construction engineering.
Recommended: Sophomore standing

CCE 321. CIVIL AND CONSTRUCTION ENGINEERING MATERIALS. (4 Credits)
Highway materials; aggregate, concrete and asphalt. Standard test methods.
Prerequisites: ((ENGR 213 with C or better or ENGR 213H with C or better) and (ST 314 [C] or BA 276 [C]))
Equivalent to: CCE 321H, CE 321

CCE 321H. CIVIL AND CONSTRUCTION ENGINEERING MATERIALS. (4 Credits)
Highway materials; aggregate, concrete and asphalt. Standard test methods.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (ST 314 [C] or BA 276 [C])
Equivalent to: CCE 321
CCE 421. ADVANCED CONCRETE PROPERTIES AND PERFORMANCE. (4 Credits)
Cement production, hydration, supplementary cementitious materials, mixture design and proportioning, heat of hydration, volume stability, shrinkage, cracking, expansion, creep, relaxation, admixtures, alternative binders, strength gain, durability.
Prerequisites: CCE 321 with C or better

CCE 422. GREEN BUILDING MATERIALS. (3 Credits)
Introduces concepts of construction with green building materials. Specific concepts include evaluation of what truly makes a material ‘green’, long-term performance (e.g., durability) of materials, material production and life cycle cost analysis. Concepts of green building programs, guidelines and specifications will be introduced.
Prerequisites: CE 321 with C or better or CCE 321 with C or better
Recommended: (ECON 201 or ECON 201H or ECON 202 or ECON 202H) and ST 314

CCE 423. CONCRETE FUNDAMENTALS. (4 Credits)
Portland cement hydration, microstructural development, fresh and hardened properties, testing standards, durability, alternative cements.
Recommended: CCE 321

CCE 424. ASPHALT FUNDAMENTALS. (3 Credits)
Focuses on characterization of asphalt materials and mixtures, current laboratory testing technology for asphalt binders and mixes, engineering of asphalt mixes to meet design requirements, asphalt recycling process, environmental impacts of asphalt pavements, and recent developments in asphalt technology.
Prerequisites: CCE 321 with C or better

CCE 520. SELECTED TOPICS IN INFRASTRUCTURE MATERIALS. (0-4 Credits)
A critical examination of in-depth topics selected by the instructor from among topics not covered in other infrastructure materials courses. This course is repeatable for 16 credits.

CCE 522. GREEN BUILDING MATERIALS. (3 Credits)
Introduces concepts of construction with green building materials. Specific concepts include evaluation of what truly makes a material ‘green’, long-term performance (e.g., durability) of materials, material production and life cycle cost analysis. Concepts of green building programs, guidelines and specifications will be introduced.
Recommended: (CCE 321 or ECON 201 or ECON 201H or ECON 202 or ECON 202H) and ST 314

CCE 523. CONCRETE FUNDAMENTALS. (4 Credits)
Portland cement hydration, microstructural development, fresh and hardened properties, testing standards, durability, alternative cements.
Recommended: CCE 321 or similar introductory materials course or CCE 421

CCE 524. ASPHALT FUNDAMENTALS. (3 Credits)
Focuses on characterization of asphalt materials and mixtures, current laboratory testing technology for asphalt binders and mixes, engineering of asphalt mixes to meet design requirements, asphalt recycling process, environmental impacts of asphalt pavements, and recent developments in asphalt technology.

CCE 525. CONSTRUCTION SITE SYSTEMS ENGINEERING. (3 Credits)
Design and planning of construction site field operations and engineered systems. Systems analysis and design as it applies to civil engineering projects. Design of construction systems: blasting; rock crushing and conveying; dewatering; cranes, pile driving, and rigging; and concrete pumping and placement. Construction site design and process design.

CCE 526. DESIGN FOR SAFETY. (3 Credits)
Theoretical concepts and industry practices used to model, evaluate, and improve construction worker safety through the design of the project features, construction operations, and site safety program elements. Causes of construction site accidents, hazard recognition and comprehension, safety risk valuation and mitigation, and the true costs of injuries and fatalities.

CCE 528. ADVANCED VIRTUAL DESIGN AND CONSTRUCTION. (4 Credits)
Focusing on the skills and information needed to effectively use an existing Building Information Model (BIM) in plan execution for a building construction project. This is a project based course where students gain knowledge on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction and operations.
Recommended: CCE 203 [D-]

CCE 529. LEAN CONSTRUCTION. (3 Credits)
Introduction to the basics of lean production management, especially about how they are applied to the AEC industry to improve the operation management and product development. Class topics include theory of manufacturing science, principles of the lean production system, application of production management to project management, variability management in design and construction, improving project performance in the AEC industry, data gathering and process evaluation for productivity improvement.

CCE 552. PROJECT RISK MANAGEMENT. (4 Credits)
An introduction to the concept of project risk in producing constructed engineering projects. Course content includes project baselining, risk definition and identification, risk assessment and management techniques, risk control, risk response, and risk management. CROSSLISTED as CCE 552/IE 586.
Equivalent to: IE 586

CCE 554. PROFESSIONAL RESPONSIBILITY AND ETHICS. (3 Credits)
An in-depth exploration of professional engineering ethics. Course content includes conceptual theoretical basis of ethics, ethics among professional organizations, ethical consideration of design, critical analysis of ethical situations, ethics in the workplace, and ethical considerations regarding the broader environment. CROSSLISTED as CCE 554/IE 589.
Equivalent to: IE 589

CCE 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

CCE 621. DURABILITY AND CONDITION ASSESSMENT OF REINFORCED CONCRETE. (4 Credits)
Concrete durability including freeze-thaw attack, sulfate attack, corrosion, alkali-silica reaction, long-term performance, durability modeling, durability of alternative cements. Non-destructive condition assessment; model-assisted testing; corrosion detection and monitoring; multi-scale assessment; service/remaining life predictions.
Prerequisites: CCE 523 with C or better
Recommended: CCE 521
CCE 623. CORROSION OF METALS AND CORROSION CONTROL. (4 Credits)
Recommended: CH 202 or CH 231 or CH 231H or CCE 321

CCE 624. SERVICE LIFE MODELING OF INFRASTRUCTURE MATERIALS. (4 Credits)
Recommended: Undergraduate level calculus and chemistry courses

Construction Engineering Management

CEM 263. PLANE SURVEYING. (3 Credits)
Use of field surveying equipment; error analysis; plane surveying methods applied to construction; plane coordinate computations; topographic mapping; and introduction to GPS. Lec/lab.
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better

CEM 311. HYDRAULICS. (4 Credits)
Pressure and energy concepts of fluids, fluid measurements, flow in pipes and open channels.
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better

CEM 326. CONSTRUCTION SAFETY. (3 Credits)
Training in construction safety with emphasis on hazard identification, avoidance, control, and prevention. Lec/rec.
Prerequisites: CCE 207 with C or better or CEM 407 with C or better

CEM 341. CONSTRUCTION ESTIMATING I. (4 Credits)
Fundamentals of estimating and bidding construction projects; plan reading, specification interpretation; quantity take-off; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; estimating profit, and computer-aided estimating.
Prerequisites: CEM 442 with C or better
Recommended: CCE 102 and CCE 201

CEM 342. CONSTRUCTION ESTIMATING II. (4 Credits)
Fundamentals of estimating and bidding construction projects; plan reading, specification interpretation; quantity take-off; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; estimating profit, and computer-aided estimating.
Prerequisites: CEM 341 with C or better

CEM 343. CONSTRUCTION PLANNING AND SCHEDULING. (4 Credits)
Principles of construction planning, scheduling, and resource optimization; scheduling techniques and calculations; methods for integrating project resources (materials, equipment, personnel, and money) into the schedule.
Prerequisites: CEM 342 (may be taken concurrently) with C or better
CEM 541. HEAVY CIVIL CONSTRUCTION MANAGEMENT. (4 Credits)
Heavy civil construction management methods. Construction equipment types, capabilities, costs, productivity, and the selection and planning of equipment needed for a project. Soil characteristics, quantity analysis, and movement on construction sites.
Recommended: FE 315 or CE 372

CEM 543. PROJECT MANAGEMENT FOR CONSTRUCTION. (4 Credits)
Project management concepts for construction; concepts, roles and responsibilities, labor relations and supervision, administrative systems, documentation, quality management, and process improvement.

CEM 550. CONTEMPORARY TOPICS IN CONSTRUCTION ENGINEERING MANAGEMENT. (4 Credits)
Contemporary topics of emerging technologies and processes, construction engineering and management, how industry environmental change causes development of new technologies, and the applications of the technologies in the field.

CEM 551. PROJECT CONTROLS. (4 Credits)
Advanced methods of project controls including advanced technologies and methodologies for quality, time, and cost management; project management organization models, and intra-organizational relationships.

CEM 552. RISK MANAGEMENT IN CONSTRUCTION. (4 Credits)
An introduction to the concept of risk in construction projects and construction firms, including risk definition, identification, assessment and management techniques; contractual risk control, sharing and shedding; and contingency management.

CEM 553. CONSTRUCTION BUSINESS MANAGEMENT. (4 Credits)
Introduction to concepts of business structures associated with the construction industry; enterprise-level management techniques; extra-organizational risk management; and operational management structuring.

Architectural Engineering Undergraduate Major (BS, HBS)

This program provides students with breadth and depth in the engineering sciences of buildings and their systems: structural systems; heating, ventilation and air-conditioning (HVAC) systems; electrical and lighting systems; construction engineering and management. The program emphasizes integration across architectural engineering disciplines as well as with the existing civil engineering and construction engineering programs. This program allows students to specialize in a chosen discipline while gaining the knowledge and skills to become leaders in the design and construction of green, energy efficient and more complex buildings.

Major Code: 826

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Synthesis (2 courses) 6
Difference, Power and Discrimination (1 course) 3

Mathematics, Statistics, Physics, Chemistry

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Structural Engineering

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Mechanical, Electrical, Plumbing, Fire Protection

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Other Technical Topics

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**Civil Engineering Graduate Major (MENG, MS, PhD)**

**Graduate Areas of Concentration**

Civil engineering, coastal and ocean engineering, construction, engineering education, geomatics, geotechnical engineering, infrastructure materials, structural engineering, transportation engineering, and water resources engineering

The School of Civil and Construction Engineering offers graduate work leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees. The MEng, MS, and PhD degrees offer concentrations in civil engineering, coastal and ocean engineering, construction, engineering education, geomatics, geotechnical engineering, infrastructure materials, structural engineering, transportation engineering, water resources engineering, and interdisciplinary areas. Areas of concentration can also be combined to form an integrated civil engineering MS program or MS and PhD minors.
The MEng is a course work-only degree requiring a final oral exam. For the MS degree, a thesis or project is required. The PhD degree requires a dissertation.

Degree programs prepare the student for advanced-level entry into professional engineering practice and for careers in research and teaching. Majors within the department constitute approximately two-thirds of the total program. Minor fields may be selected from departmental offerings in different subject areas, from other engineering disciplines, or from other fields of study that support the major. The school also participates in the Master of Arts in Interdisciplinary Studies program.

For more information, contact the CCE Graduate Program Coordinator, 541-737-4934, or cce.school@oregonstate.edu

Major Code: 3060

**MEng**

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No more than 6 credits of the following blanket numbered courses:

| CE 501 | RESEARCH                          |
| CE 505 | READING AND CONFERENCE            |
| CE 507 | SEMINAR                           |

Total Hours 45

**MS**

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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate level, non-Blanket CCE courses</td>
<td>includes CE, CCE, and CEM courses</td>
<td>minimum 15</td>
</tr>
<tr>
<td>Seminar</td>
<td>CE 507 SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>Elective coursework in Major should be selected in concert with faculty advisor in student's Area of Concentration</td>
<td>maximum 23</td>
</tr>
</tbody>
</table>

No more than 6 credits of the following blanket numbered courses:

| CE 501 | RESEARCH                          |
| CE 505 | READING AND CONFERENCE            |
| CE 507 | SEMINAR                           |

Thesis

| CE 503 | THESIS                           |

Total Hours 45

**PhD**

A qualifying exam is required for the PhD in all Areas of Concentration. Format is determined by faculty in the Area.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate level, non-Blanket CCE courses</td>
<td>includes CE, CCE, and CEM courses</td>
<td>minimum 15</td>
</tr>
<tr>
<td>Seminar</td>
<td>CE 507 SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>Elective coursework in Major should be selected in concert with faculty advisor in student's Area of Concentration</td>
<td>maximum 56</td>
</tr>
</tbody>
</table>

No more than 6 credits of the following blanket numbered courses:

| CE 507 | RESEARCH                          |
| CE 605 | READING AND CONFERENCE            |

Thesis

| CE 603 | THESIS                           |

Total Hours 108

1. This limit excludes CE 506/CE 606 credits for project-in-lieu-of-thesis programs
2. A minimum of 18 credits to be taken during the PhD course of study, excluding credits in CE 601, CE 603, CE 605, and CE 606

**MAIS**

The School of Civil & Construction Engineering also participates in the Master of Arts in Interdisciplinary Studies (MAIS) degree program. See the Graduate School for details.

Major Code: 3060

**Civil Engineering Graduate Minor**

The School of Civil and Construction Engineering offers graduate minor degrees in Civil Engineering. The Graduate minor in Civil Engineering is for masters and doctoral level students who seek additional formal training and mentoring in civil engineering.

For more information, contact the CCE Graduate Program Coordinator, 541-737-4934, or cce.school@oregonstate.edu

Minor Code: 3060

**Civil Engineering Undergraduate Major (BA, BS, HBA, HBS)**

The Bachelor of Science and Honors Bachelor of Science degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

Civil engineering is a diverse professional field with discipline specialties in structures, transportation, water supply and water pollution control, geotechnical engineering, hydrology, hydraulics and water resources, geomatics, ocean engineering, construction, and engineering planning and economics. All civil engineering students receive basic instruction in the various disciplines, with the option for additional elective courses in desired areas. The program is supported by highly qualified faculty and staff that maintain the programs and facilities at the highest level of quality.

The civil engineering curriculum within the School of Civil and Construction Engineering (CCE) includes the basic sciences, social
sciences, humanities, communication skills, engineering sciences, and engineering design to teach students an integrated approach to finding practical solutions.

The mission of the civil engineering program is to provide a comprehensive, state-of-the-art education to prepare students for professional and responsible engineering positions with business, industry, consulting firms or government.

Program Educational Objectives—Civil Engineering

Note: The Bachelor of Science and Honors Bachelor of Science degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org, which requires stated program educational objectives and student outcomes to support these.

OSU Civil Engineering graduates receive a compelling education, and within 3 to 5 years of graduation will have:

1. Assembled, analyzed and synthesized/evaluated information to solve engineering problems and perform modern civil engineering design by applying mathematics, engineering sciences and fundamentals of civil engineering.
2. Participated in modern professional practice or a graduate program in a specialty area of civil engineering, demonstrating effective communication, collaborative work and leadership in diverse teams, ethical decision-making, successful management of personal and professional career objectives, and continual development through lifelong learning and professional involvement.
3. Recognized the importance of professional licensure and have achieved or prepared to achieve this significant accomplishment. In this endeavor, consideration of the public health, welfare and safety is seen as the paramount priority.
4. Applied an understanding of public policy and contemporary societal issues with sensitivity to the challenge of meeting social, environmental, and economic constraints within a global community.

Student Outcomes for Civil Engineering Programs

The OSU Civil Engineering program prepares its graduates to achieve the Program Educational Objectives above several years into their careers. This is achieved by having students able to perform the following on graduation, well preparing them for active immediate and lifelong service in the profession:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Design is the essence of civil engineering. Junior and senior level courses include extensive design content, culminating in a team approach to the solution of open-ended, realistic problems, including capstone design and professional practice courses. Courses with design content include those with ‘design’ in their titles. A more detailed explanation of the design experience and design course sequences is contained in the 'Civil Engineering Advising Guide', which may be viewed on the school's website (http://cce.oregonstate.edu/academic-advising/).

Major Code: 306

A student may also earn a concurrent Bachelor of Arts (BA) or Honors Bachelor of Arts (HBA) degree by completing 32 additional credits in residence including language proficiency equivalent to that attained at the end of the second year of a foreign language as certified by the School of Language, Culture, and Society. Neither the BA nor the HBA degree in civil engineering is accredited by the Engineering Commission of ABET.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCE 101</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING ORIENTATION</td>
<td>2</td>
</tr>
<tr>
<td>CCE 102</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING: PROBLEM-SOLVING AND TECHNOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
</tr>
<tr>
<td>CH 202</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
</tr>
<tr>
<td>CH 205</td>
<td>LABORATORY FOR CH 202</td>
<td>1</td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS</td>
<td>1</td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>*Perspectives: Literature and the Arts Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td>44-45</td>
</tr>
</tbody>
</table>

| Second Year | | |
| Approved Biological Science Course | 1 | |
| CCE 201 | CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN | 3 |
| CCE 207 | CCE SEMINAR | 1 |
| CE 202 | CIVIL ENGINEERING: GEOSPATIAL INFORMATION AND GIS | 3 |
| ENGR 211 | STATICS | 3 |
| ENGR 212 | DYNAMICS | 3 |
| ENGR 213 | STRENGTH OF MATERIALS | 3 |
| MTH 256 | APPLIED DIFFERENTIAL EQUATIONS | 4 |
| MTH 306 | MATRIX AND POWER SERIES METHODS | 4 |
| PH 212 | *GENERAL PHYSICS WITH CALCULUS | 8 |
| & PH 213 | *GENERAL PHYSICS WITH CALCULUS | |
| ST 314 | INTRODUCTION TO STATISTICS FOR ENGINEERS | 3 |
| WR 327 | *TECHNICAL WRITING | 3 |
| *Perspectives: Cultural Diversity Course | 3 |
| Hours | | 45 |

| Third Year | | |
| CCE 321 | CIVIL AND CONSTRUCTION ENGINEERING MATERIALS | 4 |
Construction Engineering Management Undergraduate Major (BA, BS, HBA, HBS)

The School of Civil and Construction Engineering offers BA and BS degrees in Construction Engineering Management (CEM). This unique program blends principles of basic science, engineering, and technology with a strong component of business subjects to prepare graduates for a productive career in the construction industry. The BS in Construction Engineering Management is ACCE accredited.

The CEM program is built on a rigorous four-year curriculum that emphasizes practical applications as well as basic principles. Students are given hands-on experiences in the laboratory and are involved in field trips as a supplement to their classroom activities. A more detailed explanation of the CEM Program is contained in the 'Construction Engineering Management Advising Guide,' which may be viewed on the school’s website (http://cce.oregonstate.edu/academic-advising/).

The mission of the CEM program is to provide a comprehensive, state-of-the-art education to prepare students for professional and responsible constructor positions with business, industry, consulting firms or government. The program’s educational objectives are to:

1. Provide a compelling education based in the natural sciences, mathematics, engineering sciences, and business, and in the fundamental paradigms, concepts, understandings, applications, and knowledge of civil and construction engineering and construction management.

2. Develop students’ abilities through their education to analyze, synthesize, and evaluate information, solve engineering problems, and be prepared to effectively perform project engineering and management tasks for effective execution of construction projects.

3. Provide education for modern professional practice including the abilities for effective communication, collaborative work in diverse teams, ethical decision-making, successful management of personal and professional career objectives, and continual development through lifelong learning and professional involvement.

4. Prepare our graduates for either immediate employment or for graduate school opportunities in construction or business.

5. Provide students with knowledge of contemporary societal issues and a sensitivity to the challenge of meeting social, environmental, and economic constraints within a global community.

**Civil Engineering-Forest Engineering**

A five-year dual-degree program in civil engineering and forest engineering is offered jointly by the School of Civil and Construction Engineering in the College of Engineering and Forest Engineering in the College of Forestry. Advising is done through either academic unit. See Forest Engineering, Resources and Management in the College of Forestry.

**Geomatics (Surveying and Mapping)**

Graduates of civil engineering are eligible to take the Fundamentals of Land Surveying Examination in pursuit of the Professional Land Surveying license by selecting courses as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 311</td>
<td>FLUID MECHANICS</td>
<td>4</td>
</tr>
<tr>
<td>CE 313</td>
<td>HYDRAULIC ENGINEERING</td>
<td>4</td>
</tr>
<tr>
<td>CE 361</td>
<td>SURVEYING THEORY</td>
<td>4</td>
</tr>
<tr>
<td>CE 372</td>
<td>GEOTECHNICAL ENGINEERING I</td>
<td>4</td>
</tr>
<tr>
<td>CE 373</td>
<td>GEOTECHNICAL ENGINEERING II</td>
<td>4</td>
</tr>
<tr>
<td>CE 381</td>
<td>STRUCTURAL THEORY I &amp; II</td>
<td>8</td>
</tr>
<tr>
<td>CE 392</td>
<td>INTRODUCTION TO HIGHWAY ENGINEERING</td>
<td>4</td>
</tr>
<tr>
<td>CE 412</td>
<td>HYDROLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CE 481</td>
<td>REINFORCED CONCRETE I</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 321</td>
<td>ENVIRONMENTAL ENGINEERING FUNDAMENTALS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 383</td>
<td>DESIGN OF STEEL STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CE 418</td>
<td>CIVIL ENGINEERING PROFESSIONAL PRACTICE</td>
<td>3</td>
</tr>
<tr>
<td>CE 419</td>
<td>CIVIL INFRASTRUCTURE DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>CE 420</td>
<td>ENGINEERING PLANNING</td>
<td>4</td>
</tr>
<tr>
<td>CE 491</td>
<td>TRANSPORTATION ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 201</td>
<td>ELECTRICAL FUNDAMENTALS I</td>
<td>3</td>
</tr>
</tbody>
</table>

*Difference, Power, and Discrimination*  
*Perspectives: Western Culture Course*  
*Synthesis: Contemporary Global Issues Course*  
*Synthesis: Science, Technology, and Society Course*  
**Technical Electives**  
11  

Total Hours 180-181

* Baccalaureate Core Course (BCC)  
* Writing Intensive Course (WIC)  
1 Prerequisite for several upper-division courses  
† Must be selected to satisfy the requirements of the baccalaureate core  

**Code Title Hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CE 361</td>
<td>SURVEYING THEORY</td>
<td>4</td>
</tr>
<tr>
<td>CE 365</td>
<td>HIGHWAY LOCATION AND DESIGN</td>
<td>12</td>
</tr>
<tr>
<td>CE 461/CE 561</td>
<td>PHOTOGRAMMETRY</td>
<td></td>
</tr>
<tr>
<td>CE 463/CE 563</td>
<td>CONTROL SURVEYING</td>
<td></td>
</tr>
<tr>
<td>CE 465/CE 565</td>
<td>OREGON LAND SURVEY LAW</td>
<td></td>
</tr>
<tr>
<td>CE 469/CE 569</td>
<td>PROPERTY SURVEYS</td>
<td></td>
</tr>
<tr>
<td>CE 562</td>
<td>DIGITAL TERRAIN MODELING</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 16

**Major Code: 306**
HHS 241 *LIFETIME FITNESS (or any PAC course) 1 1-2
MTH 251 *DIFFERENTIAL CALCULUS 4
MTH 252 INTEGRAL CALCULUS 4
PH 211 *GENERAL PHYSICS WITH CALCULUS 4
WR 121 *ENGLISH COMPOSITION 3

*Perspectives: Cultural Diversity Course 1
*Perspectives: Literature and the Arts Course 1

+ Must be selected to satisfy the requirements of the baccalaureate core

**Geomatics (Surveying and Mapping)**
Construction engineering management graduates are eligible to take the Fundamentals of Land Surveying Examination by completing:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 365</td>
<td>HIGHWAY LOCATION AND DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>CEM 263</td>
<td>PLANE SURVEYING</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select 10 credits from the following:</td>
<td></td>
</tr>
<tr>
<td>CE 461/CE 561</td>
<td>PHOTOGRAMMETRY</td>
<td>4</td>
</tr>
<tr>
<td>CE 463/CE 563</td>
<td>CONTROL SURVEYING</td>
<td>4</td>
</tr>
<tr>
<td>CE 465/CE 565</td>
<td>OREGON LAND SURVEY LAW</td>
<td>4</td>
</tr>
<tr>
<td>CE 469/CE 569</td>
<td>PROPERTY SURVEYS</td>
<td>4</td>
</tr>
<tr>
<td>CE 562</td>
<td>DIGITAL TERRAIN MODELING</td>
<td>4</td>
</tr>
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</table>

Total Hours: 16

**Major Code: 338**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCE 101</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING ORIENTATION</td>
<td>2</td>
</tr>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bacc Core Course: Lit &amp; Arts</td>
<td>3</td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCE 102</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING: PROBLEM-SOLVING AND TECHNOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Bacc Core Course: Cultural Diversity</td>
<td>3</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Bacc Core Course: Cultural Diversity</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 16

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
<td>4</td>
</tr>
<tr>
<td>CCE 201</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>CCE 207</td>
<td>CCE SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>PH 212</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>ST 314</td>
<td>INTRODUCTION TO STATISTICS FOR ENGINEERS</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bacc Core Course: Bio Lab Science</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours: 14

**Second Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 330</td>
<td>LEGAL ENVIRONMENT OF BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>CCE 203</td>
<td>INTRODUCTION TO VIRTUAL DESIGN AND CONSTRUCTION</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 211</td>
<td>STATICS</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 14

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEM 263</td>
<td>PLANE SURVEYING</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 3

**Fourth Year**

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)
1 Prerequisite for several upper-division courses
The School of Electrical Engineering and Computer Science (EECS) at Oregon State University is to provide a comprehensive, state-of-the-art education that prepares our students to be successful in engineering and computing practice and advanced studies.

Consistent with the mission of the university and college, the mission of the School of Electrical Engineering and Computer Science (EECS) at Oregon State University is to provide a comprehensive, state-of-the-art education that prepares our students to be successful in engineering and computing practice and advanced studies.

The school has a tradition of strong undergraduate programs and one of the largest graduate programs within the university, with internationally recognized research programs in the areas of mixed-signal integration, artificial intelligence and machine learning, computer graphics and vision, energy systems, multimedia and networking, materials and devices, end-user software, human-computer interaction, and signal processing and communications systems.

The School of EECS faculty, advising procedures, undergraduate programs’ educational objectives, graduate program application procedures, research areas, and many other aspects may be found at the school’s (http://eecs.oregonstate.edu) website. The Multiple Engineering Cooperative Program (MECOP) offers internships to selected students in the discipline areas of computer science, electrical engineering, and computer engineering.

### Electrical and Computer Engineering

The School of EECS offers programs leading to the BS, MS, MEng, and Ph.D. degrees in Electrical and Computer Engineering (ECE).

Electrical and computer engineers engage in the design, construction and programming, and applications of electronic and integrated circuits, digital computers and embedded systems, power generation and utilization, communication and computer networks, electronic materials and devices, electromagnetic, microwave and optical circuits and systems, control systems, and signal processing and conditioning.

Course work leading to the BS degree consists of courses in many of these topics as well as courses in the supporting disciplines of mathematics, physical sciences, and computer science. Students select further study beyond the required courses for either more depth in a subdiscipline or further breadth across engineering. Students fulfill humanities and social science requirements as specified by the university’s baccalaureate core program. The BS program is supported by well-equipped laboratories providing hands-on experience with electronic circuits, digital logic, electronic and photonic materials, electric machines, IC design, optoelectronics, RF techniques, instrumentation, and microprocessors.

The program incorporates engineering design principles throughout the undergraduate curriculum. This includes the integration of societal, economic, legal, regulatory, ethical, environmental, and other factors into the technical aspects of engineering design. Design activities begin in the freshman orientation sequence, which incorporates open-ended design problems and continues throughout the curriculum. The design experience culminates with a yearlong senior design project. During the senior design experience, students working in teams complete all phases of a design project under the supervision of a faculty member.

Graduates of this program are prepared to either seek industrial employment or pursue advanced graduate degrees.

The Bachelor of Science and Honors Bachelor of Science degrees in Electrical & Computer Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The ECE graduate program provides opportunities for both MS and Ph.D. thesis programs and an MEng coursework-based program in the following areas: analog/mixed signals, communications and signal processing, networking and computer systems, energy systems, materials and devices, and RF/microwave/mmWave and photonics. Graduate work is supported by the school’s well-equipped laboratory facilities. Opportunities exist for graduate students to participate in many research projects sponsored by private industry and government agencies.

The School of Electrical and Computer Science faculty, advising procedures, undergraduate programs’ educational objectives, graduate
program application procedures, research areas, and many other aspects may be found at the school's (http://eecs.oregonstate.edu/) website.

The Multiple Engineering Cooperative Program (MECOP) offers industrial internships to selected students in the discipline areas of computer science, electrical engineering, and computer engineering.

**Computer Science**

The School of EECS offers programs leading to BA, BS, MA, MAIS, MEng, MS, and Ph.D. degrees in Computer Science (CS).

Computer science is the heart of cutting-edge computing software. Computer scientists invent software that enables computers to do new things. They design programming languages, compilers, operating systems, games, databases, computer networks, and user interfaces. They solve complex challenging problems in a wide range of fields that can make a positive difference in the world.

Computer science majors learn skills to create realistic graphics, design new problem-solving tools that anyone can use, and create new solutions for business, medicine, and entertainment. Their programming skills enable computers to 'learn' as they process data as well as assist in social communication and technologies to improve the lives of disadvantaged persons.

Computer science offers a foundation that allows graduates to make software work well, make it fast, make it work correctly, find where innovation is needed, and understand the people who will be using it, so as to make it genuinely useful and compelling to people. Much of computer science course work is carried out in teams, and students gain experience in teamwork, professionalism in writing, working with clients, and making presentations of their teams' efforts.

Course work leading to the BS degree consists of required courses in many of these topics, as well as courses in supporting disciplines such as mathematics. The BS program is supported by well-equipped computer laboratories. Students select further study beyond the required core courses, opting for more depth in computer science, more breadth in business and entrepreneurship, or grounding in an application area for their computing skills. The BS program culminates with a yearlong senior capstone project, where students working in teams complete all phases of a software project under the supervision of a faculty member.

Graduates of this program are prepared either to pursue advanced graduate degrees or seek employment in business, industry or government.

The Bachelor of Science (BS) and Honors Bachelor of Science (HBS) degrees for the Computer Systems Option (CSO) of the Computer Science program are accredited by the Computing Accreditation Commission of ABET, http://www.ABET.org.

The School of Electrical and Computer Science faculty, advising procedures, undergraduate programs’ educational objectives, graduate program application procedures, research areas, and many other aspects may be found at the school's (http://eecs.oregonstate.edu/) website.

The Multiple Engineering Cooperative Program (MECOP) offers internships to selected students in the discipline areas of computer science, electrical engineering, and computer engineering.

**Undergraduate Programs**

**Majors**

- Computer Science (p. 454)
  - Options:
    - Applied Computer Science
    - Computer Science Double Degree
    - Computer Systems
- Electrical and Computer Engineering (p. 458)

**Minor**

- Computer Science (p. 453)

**Certificate**

- CyberSecurity (p. 456)

**Graduate Programs**

**Majors**

- Computer Science (p. 451)
- Electrical and Computer Engineering (p. 456)

**Minors**

- Computer Science (p. 453)
- Electrical and Computer Engineering (p. 458)

**Tom Weller, School Head**

1148 Kelley Engineering Center
Oregon State University
Corvallis, OR 97331-5501
Phone: 541-737-3617
Website: http://eecs.oregonstate.edu/

**Faculty**

**Distinguished Professor** Dietterich

**Professors** Adams, Allstot, Bailey, Bose, Brekken, Burnett, Conley, Cull (Emeritus), Daghat, Erwig, A. Fern, Hamdaoui, Lee, Liu, Mathews, Mayaram, Moon, Nguyen, Pancake (Emeritus), Tadeppalli, Temes, Wagner (Emeritus), Weller, Weisshaar, L. Zhang

**Associate Professors** Borradaile, Budd (Emeritus), Chiang, Cotilla-Sanchez, de Amicis, Digg, X. Fern, Jander, Jensen, Magaña, Minoura (Emeritus), Natarajan, Plant (Emeritus), Raich, Sarma, Scaffidi, Todorovic, Wang, Wong

**Assistant Professors** T. Anand, Bobba, Cao, L. Chen, Cheng, Fu, Hendrix, L. Huang, Hutchinson, Jang, Johnston, Kim, Knight, Labram, F. Li, Natarajan, Nayyeri, Parham-Mocello, Ramsey, Rosulek, Termechey, Walkingshaw

**Senior Instructor** Traylor, McGrath
Computer Science

CS 101. COMPUTERS: APPLICATIONS AND IMPLICATIONS. (4 Credits)
The varieties of computer hardware and software. The effects, positive
and negative, of computers on human lives. Ethical implications of
information technology. Hands-on experience with a variety of computer
applications. Lec/lab.
Prerequisites: MTH 112 with C or better or MTH 112 with C or better or
MTH 251 with C or better or MTH 251H with C or better
Equivalent to: EECS 160

Global Learning

CS 102. INTRODUCTION TO COGNITIVE SCIENCE. (3 Credits)
Introduction to the study of the mind. The role of the brain and
computer models of thought. (Note: Students may take only one of
MTH 202 or CS 102.)
Prerequisites: MTH 112 with C- or better
Equivalent to: CS 151

CS 103. FOUNDATIONS OF INFORMATION TECHNOLOGY. (4 Credits)
Survey of major areas of information technology. Introduction to
computer hardware and software. Skills development. Lec/ rec.
Prerequisites: MTH 111 with C- or better or MTH 112 with C- or better
or Math Placement - ALEKS with a score of 061
Equivalent to: CS 160

CS 104. INTRODUCTION TO JAVA PROGRAMMING. (3 Credits)
Introduction to the computer science field and profession. Team problem
solving. Introduction to writing computer programs. Approaches to
teaching course topics vary across sections. Lec/lab.
Prerequisites: MTH 111 with C- or better or MTH 112 with C- or better
Equivalent to: CS 150

CS 105. THE INTERNET AND THE WEB. (3 Credits)
An introduction to the Internet and the World Wide Web. Basics of
hyperlinking, programming, and HTML. History and uses of the
World Wide Web; hypertext and HTML; site and page design; media
integration; issues raised by Internet publishing.
Equivalent to: CS 295

CS 106. INTRODUCTION TO COMPUTER SCIENCE I. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to
problem solving, software engineering, and object-oriented programming.
Includes algorithm design and program development. Lec/lab/rec.
Prerequisites: MTH 112 (may be taken concurrently) with C or better or
Math Placement Test with a score of 061 or Math Placement - ALEKS with
a score of 061
Equivalent to: EECS 161

CS 107. INTRODUCTION TO COMPUTER SCIENCE II. (4 Credits)
Basic data structures. Computer programming techniques and
application of software engineering principles. Introduction to analysis of
programs. Lec/lab/rec.
Prerequisites: CS 161 with C or better or EECS 161 with C or better
Equivalent to: EECS 162

CS 108. INTRODUCTION TO COMPUTER SCIENCE III. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to
problem solving, algorithm development, data types, and basic data
structures. Introduction to analysis of algorithms and principles of
software engineering. System development and computer programming
using procedural/object-oriented paradigms. Offered via Ecampus only.
Prerequisites: MTH 112 with C or better or Math Placement - ALEKS with
a score of 075

CS 109. INTRODUCTION TO COMPUTER SCIENCE IV. (4 Credits)
Introduction to computer science and software engineering. Team
problem solving. Introduction to writing computer programs. Approaches to
teaching course topics vary across sections. Lec/lab.
Prerequisites: MTH 111 with C- or better or MTH 112 with C- or better
or Math Placement - ALEKS with a score of 061
Equivalent to: CS 160

CS 110. INTRODUCTION TO COMPUTER SCIENCE V. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to
problem solving, software engineering, and object-oriented programming.
Includes algorithm design and program development. Lec/lab/rec.
Prerequisites: MTH 112 with C- or better or MTH 112 with C- or better or
Math Placement Test with a score of 061 or Math Placement - ALEKS with
a score of 061
Equivalent to: CS 160

CS 111. INTRODUCTION TO COMPUTER SCIENCE VI. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to
problem solving, software engineering, and object-oriented programming.
Includes algorithm design and program development. Lec/lab/rec.
Prerequisites: MTH 112 with C- or better or MTH 112 with C- or better or
Math Placement Test with a score of 061 or Math Placement - ALEKS with
a score of 061
Equivalent to: CS 160

CS 112. INTRODUCTION TO COMPUTER SCIENCE VII. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to
problem solving, software engineering, and object-oriented programming.
Includes algorithm design and program development. Lec/lab/rec.
Prerequisites: MTH 112 with C- or better or MTH 112 with C- or better or
Math Placement Test with a score of 061 or Math Placement - ALEKS with
a score of 061
Equivalent to: CS 160

CS 113. INTRODUCTION TO COMPUTER SCIENCE VIII. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to
problem solving, software engineering, and object-oriented programming.
Includes algorithm design and program development. Lec/lab/rec.
Prerequisites: MTH 112 with C- or better or MTH 112 with C- or better or
Math Placement Test with a score of 061 or Math Placement - ALEKS with
a score of 061
Equivalent to: CS 160
CS 295. WEBSITE MANAGEMENT. (4 Credits)
How to create and promote a dynamic website using existing frameworks/libraries: Designing, developing, publishing, maintaining, and marketing dynamic websites; web security and privacy issues; emerging web technologies; running a website marketinng campaign.
Prerequisites: CS 195 with C or better
Recommended: Basic HTML and CSS

CS 312. SYSTEM ADMINISTRATION. (4 Credits)
Prerequisites: (CS 311 with C or better or CS 344 with C or better) and CS 372 [C]

CS 321. INTRODUCTION TO THEORY OF COMPUTATION. (3 Credits)
Survey of models of computation including finite automata, formal grammars, and Turing machines.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 321H

CS 321H. INTRODUCTION TO THEORY OF COMPUTATION. (3 Credits)
Survey of models of computation including finite automata, formal grammars, and Turing machines.
Attributes: HNRS – Honors Course Designator
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 321

CS 325. ANALYSIS OF ALGORITHMS. (4 Credits)
Recurrence relations, combinatorics, recursive algorithms, proofs of correctness.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 325H

CS 325H. ANALYSIS OF ALGORITHMS. (4 Credits)
Recurrence relations, combinatorics, recursive algorithms, proofs of correctness.
Attributes: HNRS – Honors Course Designator
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 325

CS 331. INTRODUCTION TO ARTIFICIAL INTELLIGENCE. (4 Credits)
Fundamental concepts in artificial intelligence using the unifying theme of an intelligent agent. Topics include agent architectures, search, games, logic and reasoning, and Bayesian networks.
Prerequisites: CS 325 with C or better or CS 325H with C or better

CS 340. INTRODUCTION TO DATABASES. (4 Credits)
Design and implementation of relational databases, including data modeling with ER or UML, diagrams, relational schema, SQL queries, relational algebra, user interfaces, and administration.
Prerequisites: CS 290 with C or better
Equivalent to: CS 275

CS 344. OPERATING SYSTEMS I. (4 Credits)
Introduction to operating systems using UNIX as the case study. System calls and utilities, fundamentals of processes and interprocess communication.
Prerequisites: CS 261 with C or better and (CS 271 [C] or ECE 271 [C])
Equivalent to: CS 311
Recommended: Experience programming in the C language

CS 352. INTRODUCTION TO USABILITY ENGINEERING. (4 Credits)
Basic principles of usability engineering methods for the design and evaluation of software systems. Includes the study of human-machine interactions, user interface characteristics and design strategies, software evaluation methods, and related guidelines and standards.
Prerequisites: CS 151 with C or better or CS 161 with C or better or CS 165 with C or better or CS 295 with C or better or ECE 151 with C or better
Equivalent to: CS 252

CS 361. SOFTWARE ENGINEERING I. (4 Credits)
Introduction to the 'front end' of the software engineering lifecycle; requirements analysis and specification; design techniques; project management.
Prerequisites: CS 261 with C or better

CS 362. SOFTWARE ENGINEERING II. (4 Credits)
Introduction to the 'back end' of the software engineering lifecycle implementation; verification and validation; debugging; maintenance.
Prerequisites: CS 261 with C or better
Recommended: Experience with object-oriented programming and data structures (eg. CS 161, CS 162, CS 361)

CS 370. INTRODUCTION TO SECURITY. (4 Credits)
Introductory course on computer security with the objective to introduce concepts and principles of computer systems security. Notions of security, basic crytographic primitives and their application, basics of authentication and access control, basics of key-management, basics of malware and software security.
Prerequisites: CS 344 (may be taken concurrently) with C or better

CS 372. INTRODUCTION TO COMPUTER NETWORKS. (4 Credits)
Computer network principles, fundamental networking concepts, packet-switching and circuit switching, TCP/IP protocol layers, reliable data transfer, congestion control, flow control, packet forwarding and routing, MAC addressing, multiple access techniques. CROSSTLISTED as CS 372/ECE 372.
Prerequisites: CS 261 with C or better and (ECE 271 [C] or CS 271 [C])
Equivalent to: ECE 372
Recommended: C programming and Unix familiarity

CS 373. DEFENSE AGAINST THE DARK ARTS. (4 Credits)
Introduction to the current state of the art in anti-malware, computer forensics, and networking, messaging, and web security. Broad introduction to the field of computer security.
Prerequisites: CS 344 with C or better and CS 340 [C] and CS 372 [C]

CS 381. PROGRAMMING LANGUAGE FUNDAMENTALS. (4 Credits)
An introduction to the concepts found in a variety of programming languages. Programming languages as tools for problem solving. A brief introduction to languages from a number of different paradigms.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])

CS 391. *SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE. (3 Credits)
In-depth exploration of the social, psychological, political, and ethical issues surrounding the computer industry and the evolving information society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: CS 391H, CS 391H
Recommended: CS 101 or computer literacy.
CS 391H. *SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE. (3 Credits)
In-depth exploration of the social, psychological, political, and ethical issues surrounding the computer industry and the evolving information society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: CS 391
Recommended: CS 101 or computer literacy

CS 395. WEBSITE MULTIMEDIA. (4 Credits)
How to create and deploy interactive digital multimedia through static websites: Technological, aesthetic, and pedagogical issues of communication using interactive multimedia and hypermedia; techniques for authoring interactive multimedia projects using a variety of digital media roots.
Prerequisites: CS 195 with C or better or (ART 120 with C or better and (CS 162 [C] or CS 165 [C]))

CS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CS 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: CS 407H
This course is repeatable for 16 credits.

CS 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 407
This course is repeatable for 16 credits.

CS 410. OCCUPATIONAL INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

CS 419. SELECTED TOPICS IN COMPUTER SCIENCE. (0-5 Credits)
Topics of special and current interest not covered in other courses.
Equivalent to: CS 419H
This course is repeatable for 99 credits.

CS 419H. SELECTED TOPICS IN COMPUTER SCIENCE. (1-5 Credits)
Topics of special and current interest not covered in other courses.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 419
This course is repeatable for 99 credits.

CS 420. GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE. (3 Credits)
Directed and undirected graphs; paths, circuits, trees, coloring, planar graphs, partitioning; computer representation of graphs and graph algorithms; applications in software complexity metrics, program testing, and compiling.
Prerequisites: (CS 325 with C or better or CS 325H with C or better)

CS 427. CRYPTOGRAPHY. (4 Credits)
Introduction to the theory and practice of modern cryptography. Fundamental primitives including pseudorandom generators, block ciphers, hash functions. Symmetric-key cryptography for privacy and authenticity. Public-key cryptography based on number-theoretic problems.
Prerequisites: CS 261 with C or better or MTH 355 with C or better

CS 434. MACHINE LEARNING AND DATA MINING. (4 Credits)
Introduction to machine learning and data mining algorithms (supervised learning, unsupervised learning, and reinforcement learning) tools that are widely employed in industrial and research settings.
Prerequisites: CS 325 with C or better or CS 325H with C or better

CS 440. DATABASE MANAGEMENT SYSTEMS. (4 Credits)
Relational database design, normalization, file structures, disk storage, query processing and optimization, team development of database applications.
Prerequisites: CS 261 with C or better and (CS 275 [C] or CS 340 [C])

CS 444. OPERATING SYSTEMS II. (4 Credits)
Principles of computer operating systems: concurrent processes, memory management, job scheduling, multiprocessing, file systems, performance evaluation, and networking. Lec/rec.
Prerequisites: (CS 311 with C or better or CS 344 with C or better) and (CS 271 [C] or ECE 375 [C])
Equivalent to: CS 411

CS 446. NETWORKS IN COMPUTATIONAL BIOLOGY. (3 Credits)
An introduction to biological networks and computational methods for their analysis, inference, and functional modeling. Various network centralities, topological measures, clustering algorithms, and probabilistic annotation models are introduced in the context of protein interaction, gene regulatory, and metabolic networks. The course also surveys bioinformatics methods for data-driven inference of network structure.
Prerequisites: CS 261 with C or better
Recommended: Completion or concurrent enrollment in CS 325

CS 447. WIRELESS EMBEDDED SYSTEMS. (4 Credits)
A hands-on introduction to programming wireless embedded systems (aka the 'Internet of Things'). Topics include sensors, actuators, state machines, scheduling, wireless communications, time synchronization, localization, fault tolerance, and security related to cyber-physical systems.
Prerequisites: CS 344 with C or better

CS 450. INTRODUCTION TO COMPUTER GRAPHICS. (4 Credits)
Prerequisites: CS 261 with C or better and (MTH 306 [C] or MTH 306H [C] or MTH 341 [C])

CS 453. SCIENTIFIC VISUALIZATION. (4 Credits)
Applies 3D computer graphics methods to visually understand scientific and engineering data. Methods include hyperbolic projections; mapping scalar values to color spaces; data visualization using range sliders; scalar visualization (point clouds, cutting planes, contour plots, isosurfaces); vector visualization (arrow clouds, particle advection, streamlines); terrain visualization; Delauney triangulation; and volume visualization.
Recommended: Prior experience with Unix or Windows, programming experience.
CS 457. COMPUTER GRAPHICS SHADERS. (4 Credits)
Theoretical and practical treatment of computer graphics shaders, including both RenderMan and GPU shaders. Programming in both RenderMan and OpenGL shading languages.
Recommended: Previous graphics pipeline programming experience.

CS 458. INTRODUCTION TO INFORMATION VISUALIZATION. (4 Credits)
Tools and techniques for designing, developing, and deploying interactive visualizations of abstract data sources. Discusses techniques based on principles from design, cognitive science, and perceptual psychology. Topics include 1D, 2D, 3D, multivariate representations, time-series, graphs and trees, text and documents, and interaction techniques.
Prerequisites: CS 361 with C or better

CS 461. SENIOR SOFTWARE ENGINEERING PROJECT I. (3 Credits)
Utilize software engineering methodology in a team environment to develop a real-world application. Teams will be responsible for all phases of software development, including project planning, requirements analysis, design, coding, testing, configuration management, quality assurance, documentation, and delivery. Three-term sequence required. This course fulfills the WIC requirement for computer science majors. (Writing Intensive Courses).
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CS 361 with C or better

CS 462. SENIOR SOFTWARE ENGINEERING PROJECT II. (3 Credits)
Utilize software engineering methodology in a team environment to develop a real-world application. Teams will be responsible for all phases of software development, including project planning, requirements analysis, design, coding, testing, configuration management, quality assurance, documentation, and delivery. Three-term sequence required. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CS 362 with C or better and CS 461 [C]

CS 463. SENIOR SOFTWARE ENGINEERING PROJECT. (2 Credits)
Utilize software engineering methodology in a team environment to develop a real-world application. Teams will be responsible for all phases of software development, including project planning, requirements analysis, design, coding, testing, configuration management, quality assurance, documentation, and delivery. Three-term sequence required.
Prerequisites: CS 462 with C or better

CS 464. OPEN SOURCE SOFTWARE. (4 Credits)
Provides a theoretical foundation of the history, key concepts, technologies, and practices associated with modern Free and Open Source Software (FOSS) projects, and gives students an opportunity to explore and make contributions to FOSS projects with some mentoring and guidance.
Prerequisites: CS 261 with C or better or CS 361 with C or better

CS 466. WEB-BASED START-UP PROJECT. (4 Credits)
Real-world, hands-on learning in a high-tech web/mobile-based company environment. Research in the development of product ideas, hypotheses, and business models to create customer experiments. Prototyping and statistical analysis to develop, optimize, and evaluate solutions. Rapid iteration/refactoring based on customer input, web analytics, and user engagement metrics. Offered at OSU-Cascades only.
Corequisites: CS 461

CS 467. ONLINE CAPSTONE PROJECT. (4 Credits)
Real-world team-based experience with the software engineering design and delivery cycle, including requirements analysis and specification, design techniques, and requirements and final project written documentation. For students in the online CS double-degree program only.
Prerequisites: CS 344 with C or better and CS 361 [C] and CS 362 [C]

CS 468. INCLUSIVE DESIGN (HCI). (4 Credits)
Inclusive design is designing software that works for a wide variety of differently abled customers. Teaches the skills needed to design inclusively without having to have a separate design for each differently abled customer.
Prerequisites: CS 352 with C or better
Recommended: CS 565 with a minimum grade of C

CS 472. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/ECE 472 and CS 572/ECE 572.
Prerequisites: ECE 375 with C or better
Equivalent to: CS 470, ECE 472

CS 475. INTRODUCTION TO PARALLEL PROGRAMMING. (4 Credits)
Theoretical and practical survey of parallel programming, including a discussion of parallel architectures, parallel programming paradigms, and parallel algorithms. Programming one or more parallel computers in a higher-level parallel language.
Prerequisites: CS 261 with C or better

CS 476. ADVANCED COMPUTER NETWORKING. (4 Credits)
Prerequisites: (CS 372 with C or better or ECE 372 with C or better) and (ECE 353 [C] or ST 314 [C] or ST 314H [C])
Equivalent to: ECE 476, EEC 476

CS 477. INTRODUCTION TO DIGITAL FORENSICS. (4 Credits)
Introduces concepts related to digital forensics, its role and importance, and tools and techniques for collecting and curating digital evidence. The course will also discuss the role of evidence in the justice system and some legal aspects as they pertain to digital forensics. It will introduce tools and techniques for computer and network forensics.
Prerequisites: CS 344 with C or better and CS 370 [C]

CS 478. NETWORK SECURITY. (4 Credits)
Basic concepts and techniques in network security, risks and vulnerabilities, applied cryptography and various network security protocols. Coverage of high-level concepts such as authentication, confidentiality, integrity, and availability applied to networking systems. Fundamental techniques including authentication protocols, group key establishment and management, trusted intermediaries, public key infrastructures, SSL/TLS, IPSec, firewalls and intrusion detection CROSSLISTED as CS 478/ECE 478.
Prerequisites: CS 344 with C or better and CS 370 [C]
Equivalent to: ECE 478
Recommended: CS 370
CS 480. TRANSLATORS. (4 Credits)
An introduction to compilers; attribute grammars, syntax-directed translation, lex, yacc, LR(1) parsers, symbol tables, semantic analysis, and peephole optimization.
Prerequisites: (CS 344 with C or better or CS 311 with C or better) and CS 321 [C]

CS 491. COMPUTER SCIENCE SKILLS FOR SIMULATION AND GAME PROGRAMMING. (4 Credits)
Game and simulation development is very much a data and math-intensive activity. A certain number of actions must be produced, and producing them by hand is hard. This is a middleware CS course that fills in many of the missing pieces for those wanting to enter the simulation and game development worlds in a software tool-building capacity.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C]) and MTH 252 [C]

CS 492. MOBILE SOFTWARE DEVELOPMENT. (4 Credits)
Introduction to concepts and techniques for developing mobile applications. Students will become familiar with modern mobile structure, implementation, development tools, and workflow.
Prerequisites: CS 344 with C or better

CS 493. CLOUD APPLICATION DEVELOPMENT. (4 Credits)
Covers developing RESTful cloud services, an approach based on representational state transfer technology, an architectural style and approach to communications used in modern cloud services development.
Prerequisites: CS 290 with C or better and CS 340 [C] and CS 372 [C]

CS 495. INTERACTIVE MULTIMEDIA PROJECTS. (4 Credits)
Students apply principles and procedures of digital art, design, communication, and software authoring while working on large integrated media projects.
Recommended: CS 395

CS 496. MOBILE AND CLOUD SOFTWARE DEVELOPMENT. (4 Credits)
Introduction to the concepts and techniques for developing mobile and cloud applications.
Prerequisites: CS 344 with C or better or CS 311 with C or better
Recommended: Working knowledge of at least one operating system

CS 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CS 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

CS 503. COMPUTER SCIENCE MS THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 20 credits.

CS 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

CS 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

CS 510. OCCUPATIONAL INTERNSHIP. (1-4 Credits)
This course is repeatable for 99 credits.

CS 511. PROGRAMMING AND DATA STRUCTURES. (4 Credits)
Computer programming, problem solving, data structures, object-oriented programming, recursion, sorting, dynamic programming, asymptotic time complexity.
Recommended: College algebra, plus the ability to navigate an operating system, manipulate files, and use a command line.

CS 512. DATA SCIENCE TOOLS AND PROGRAMMING. (4 Credits)
Accessing and distributing data in the cloud; relational and non-relational databases; map reduction; cloud data processing; load balancing; types of data-stores used in the cloud.
Recommended: CS 511 or an equivalent course or programming experience in in a high-level language like Python, Java or C++.

CS 515. ALGORITHMS AND DATA STRUCTURES. (4 Credits)
Greedy algorithms, divide and conquer, dynamic programming, network flow, data structures.
Recommended: Undergraduate course in algorithms

CS 516. THEORY OF COMPUTATION AND FORMAL LANGUAGES. (4 Credits)

CS 517. THEORY OF COMPUTATION. (4 Credits)
Turing machines, decidability, NP-completeness, complexity classes, randomized computation, relativization, circuit complexity, interactive proof systems, lower bounds, cryptography.

CS 519. SELECTED TOPICS IN COMPUTER SCIENCE. (0-5 Credits)
Topics of special and current interest not covered in other courses. May not be offered every year.
This course is repeatable for 99 credits.

CS 520. GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE. (3 Credits)
Directed and undirected graphs; paths, circuits, trees, coloring, planar graphs, partitioning; computer representation of graphs and graph algorithms; applications in software complexity metrics, program testing, and compiling.
Recommended: CS 325 and MTH 232

CS 521. COMPUTABILITY. (4 Credits)
Recommended: CS 516

CS 523. ADVANCED ALGORITHMS. (4 Credits)
Approximation algorithms, randomized and probabilistic algorithms, online algorithms.
Recommended: CS 515

CS 524. NP-COMPLETE AND HARDER PROBLEMS. (4 Credits)
Recommended: CS 523

CS 527. ERROR-CORRECTING CODES. (4 Credits)
Hamming codes, linear codes, cyclic codes, BCH and Reed-Solomon codes. Introduction to Galois fields. Encoding and decoding algorithms. Burst error correcting codes, asymmetric and unidirectional codes. Applications of codes for computer systems.
Recommended: Discrete math and probability
Prerequisites:
natural language processing and reinforcement learning.

nets, autoencoders and deep networks applications in computer vision.

Recommended:
near networks including long short-term memory models, deep belief
multitarget tracking.
algorithms. Learning methods for probabilistic relational models.

An introduction to the concepts and algorithms in deep learning; basic

sensitive learning.

edges, matching points and edges, color models, projective geometry,
camera calibration, epipolar geometry, homography, image stitching, and
multitarget tracking.

This course is repeatable for 99 credits.

CS 531. ARTIFICIAL INTELLIGENCE. (4 Credits)
Intelligent agents. Problem-solving as heuristic search. Adversarial
search. Constraint satisfaction methods; Arc-consistency. Knowledge
representation and reasoning. Propositional logic. Reasoning with
propositional logic: algorithms for satisfiability. First-order logic. Proof
theory, model theory, resolution refutation, forward and backward
chaining, representing events and actions. Lec/lab.

CS 532. ADVANCED ARTIFICIAL INTELLIGENCE. (4 Credits)
Knowledge representation, reasoning, and learning with relational
and first-order representations. First-order logic: proof theory, model
theory, resolution refutation, Prolog-style resolution. Inductive logic
programming. Complex belief networks: Hidden Markov models,
Viterbi algorithm, Forward-backward algorithm. Learning HMMs with
EM. Probabilistic relational models: exact and stochastic inference
algorithms. Learning methods for probabilistic relational models.

Recommended: CS 531

CS 533. INTELLIGENT AGENTS AND DECISION MAKING. (4 Credits)
Representations of agents, execution architectures. Planning: non-linear
planning, graphplan, SATplan. Scheduling and resource management.
Probabilistic agents. Dynamic belief networks. Dynamic programming
(value iteration and policy iteration). Reinforcement learning: Prioritized
sweeping, Q learning, value function approximation and SARSA (lambda),
policy gradient methods.

Recommended: CS 531

CS 534. MACHINE LEARNING. (4 Credits)
Continuous representations. Bias-variance tradeoff. Computational
learning theory. Gaussian probabilistic models. Linear discriminants.
extraction and dimensionality reduction methods. Factor analysis.
Principal component analysis. Independent component analysis. Cost-
sensitive learning.

CS 535. DEEP LEARNING. (4 Credits)
An introduction to the concepts and algorithms in deep learning; basic
feedforward neural networks, convolutional neural networks, recurrent
neural networks including long short-term memory models, deep belief
nets, autoencoders and deep networks applications in computer vision,
natural language processing and reinforcement learning.

Prerequisites: CS 534 with C or better or ROB 537 with C or better

CS 536. PROBABILISTIC GRAPHICAL MODELS. (4 Credits)
Representation of probabilistic graphical models, both directed (Bayesian
networks) and undirected (Markov networks). Exact and approximate
inference techniques. Parameter and structure learning from data.

Recommended: Strong programming skills

CS 537. COMPUTER VISION I. (3 Credits)
An introduction to low-level computer vision and visual geometry.
Topics of interest include the following: detection of interest points and
edges, matching points and edges, color models, projective geometry,
camera calibration, epipolar geometry, homography, image stitching, and
multitarget tracking.

Recommended: Undergraduate-level statistics, probability, calculus, linear
algebra, good programming skills, machine learning or AI

CS 539. SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE. (0-5 Credits)
Advanced topics in artificial intelligence. Typical topics include machine
learning for sequential and spatial data, knowledge representation and
inference, probabilistic modeling of complex systems, data mining and
information extraction.

This course is repeatable for 99 credits.

CS 540. DATABASE MANAGEMENT SYSTEMS. (4 Credits)
Purpose of database systems, levels of data representation.
Entity-relationship model. Relational systems: data definition, data
manipulation, query language (SQL), relational calculus and algebra,
data dependencies and normal forms. DBTG network model. Query
optimization, recovery, concurrency control.

Recommended: CS 261

CS 544. OPERATING SYSTEMS II. (4 Credits)
Principles of computer operating systems: concurrent processes,
memory management, job scheduling, multiprocessing, file systems,
performance evaluation, and networking. Lec/rec.

Equivalent to: CS 511
Recommended: (CS 311 or CS 344) and (CS 271 or ECE 375)

CS 546. NETWORKS IN COMPUTATIONAL BIOLOGY. (3 Credits)
An introduction to biological networks and computational methods
for their analysis, inference, and functional modeling. Various
network centralities, topological measures, clustering algorithms, and
probabilistic annotation models are introduced in the context of protein
interaction, gene regulatory, and metabolic networks. The course also
surveys bioinformatics methods for data-driven inference of network
structure.

Recommended: Completion or concurrent enrollment in CS 325

CS 549. SELECTED TOPICS ON DATA SCIENCE & SYSTEMS. (0-5 Credits)
Current topics in data science and systems, e.g. querying, inference,
and learning over large datasets; reasoning and learning on graph,
heterogeneous, and multi-modal data; data curation; knowledge
representation; systems for large data exploration and analytics;
distributed data systems; human-centered data science; fairness and
responsibility in data science.

This course is repeatable for 99 credits.

Recommended: CS 540

CS 550. INTRODUCTION TO COMPUTER GRAPHICS. (4 Credits)
2-D and 3-D graphics APIs. Modeling transformations. Viewing
specification and transformations. Projections. Shading. Texture
mapping. Traditional animation concepts. 3-D production pipeline.
Keyframing and kinetics. Procedural animation.

Recommended: CS 261 and (MTH 306 or MTH 306H or MTH 341)

CS 551. COMPUTER GRAPHICS. (4 Credits)
3-D graphics hardware: Line and polygon scan conversion, modeling
transformations, viewing transformations, matrix stacks, hierarchical
models, perspective and orthographic projections, visible surface
determination, illumination models, shading models, texture mapping, ray
tracing.

Recommended: CS 450 or CS 550

CS 552. COMPUTER ANIMATION. (4 Credits)
Traditional animation concepts: production pipeline, keyframing
implementation, interpolation, point-mass dynamics, spring-mass
systems, rigid body dynamics, forward and inverse kinematics, human
motion control, motion capture.

Recommended: CS 551
CS 553. SCIENTIFIC VISUALIZATION. (4 Credits)
Applies 3D computer graphics methods to visually understand scientific and engineering data. Methods include hyperbolic projections; mapping scalar values to color spaces; data visualization using range sliders; scalar visualization (point clouds, cutting planes, contour plots, iso-surfaces); vector visualization (arrow clouds, particle advection, streamlines); terrain visualization; Delauney triangulation; and volume visualization.
Recommended: Prior experience with Unix or Windows, programming experience.

CS 554. GEOMETRIC MODELING IN COMPUTER GRAPHICS. (4 Credits)
Advanced topics in computer graphics focusing on representation and processing of polygonal models and their application. Surface fundamentals; discrete differential geometry and topology; data structures for representing 3-D surfaces; surface subdivision and smoothing; mesh simplification and multi-resolution representation of 3-D surfaces; geometry compression; surface parameterization; geometry remeshing; topological simplification; implicit surfaces.
Recommended: CS 450

CS 555. SIGNAL AND IMAGE PROCESSING. (4 Credits)
Fundamental aspects of signal and image processing including image acquisition and display, histograms, level-set and geometric operations, convolutions, Fourier transform, image filtering, sampling theory, image transforms, human vision, color, morphological operations, and image compression.
Recommended: Knowledge of C/C++

CS 557. COMPUTER GRAPHICS SHADERS. (4 Credits)
Theoretical and practical treatment of computer graphics shaders, including both RenderMan and GPU shaders. Programming in both RenderMan and OpenGL shading languages.
Recommended: Previous graphics pipeline programming experience.

CS 559. SELECTED TOPICS IN COMPUTER GRAPHICS AND VISION. (0-5 Credits)
Advanced topics in graphics, animation, and vision. Topics include distribution ray tracing, global-illumination, radiosity, image-based modeling and rendering, vision-assisted image and video editing, 3-D vision, 3-D virtual environments, 3-D interaction, control for physical simulation, motion graphs, computational geometry, etc.
This course is repeatable for 99 credits.

CS 560. DATA-DRIVEN SOFTWARE ENGINEERING. (4 Credits)
An overview of data-driven empirical research methods that can be used to understand the different aspects of software engineering.
Prerequisites: CS 561 with C or better

CS 561. SOFTWARE ENGINEERING METHODS. (4 Credits)
Master software engineering methods and supporting tools in the context of agile processes. Teams will engage in all aspects of software development including design, testing, implementation, deployment and maintenance. 3 hours of lecture per week plus one-hour independent lab per week.
Recommended: CS 362

CS 562. SOFTWARE PROJECT MANAGEMENT. (4 Credits)
Master software project management with an emphasis on timely, cost-effective delivery of high-quality systems. Learn about existing techniques and supporting tools, with a particular focus on coordination and project management. 3 hours of lecture per week plus one-hour independent lab per week.
Recommended: CS 561

CS 563. SOFTWARE MAINTENANCE AND EVOLUTION. (4 Credits)
Contribute to the cutting-edge of software engineering. Learn about existing techniques and supporting tools, with a particular focus on maintenance and evolution. Identify opportunities to support software maintenance and evolution more effectively, by creating new knowledge and supporting systems through research and innovation. 3 hours of lecture per week plus one-hour independent lab per week.
Prerequisites: CS 561 with C or better

CS 564. FIELD STUDIES IN SE AND HCI. (4 Credits)
Deals with the type of empirical study known as the ‘case’ study. These are studies that collect data from natural software development situations as they really occur in the field, in which the researcher does not manipulate or ‘control’ anything. The course is an end-to-end coverage of the process. Mainly focuses on case studies involving human software developers in the field. The student will conduct a field study as part of this course.

CS 565. HUMAN-COMPUTER INTERACTION. (4 Credits)
Basic principles of Human-Computer Interaction (HCI) for the design and evaluation of software systems. Includes research methods for studying human-machine interactions and user interfaces, design strategies, software evaluation methods, and related guidelines and standards.

CS 567. LABORATORY STUDIES IN SE AND HCI. (4 Credits)
Empirical lab studies of software development. Covers how to go about designing, preparing for, running, analyzing, and writing-for-publication lab experiments of programming situations involving human subjects. This is an end-to-end coverage of the entire process, and will put students in a position to conduct lab studies of their own with human subjects.

CS 568. INCLUSIVE DESIGN (HCL). (4 Credits)
Inclusive design is designing software that works for a wide variety of differently abled customers. Teaches the skills needed to design inclusively without having to have a separate design for each differently abled customer.
Recommended: CS 352 [C] or CS 565 [C]

CS 569. SELECTED TOPICS IN SOFTWARE ENGINEERING. (0-5 Credits)
Topics include new programming methodologies, productivity, software development, software complexity metrics.
This course is repeatable for 99 credits.
Recommended: CS 561

CS 570. HIGH PERFORMANCE COMPUTER ARCHITECTURE. (4 Credits)
Advanced concepts in computer architecture. Performance improvement employing advanced pipelining and multiple instruction scheduling techniques. Issues in memory hierarchy and management. CROSSLISTED as CS 570/ECE 570.
Equivalent to: ECE 570
Recommended: ECE 472 or ECE 572

CS 572. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/ECE 472 and CS 572/ECE 572.
Equivalent to: ECE 572
Recommended: ECE 375
CS 575. INTRODUCTION TO PARALLEL PROGRAMMING. (4 Credits)
Theoretical and practical survey of parallel programming, including a
discussion of parallel architecture, parallel programming paradigms, and
parallel algorithms. Programming one or more parallel computers in a
higher-level parallel language.
CS 576. ADVANCED COMPUTER NETWORKING. (4 Credits)
Advanced networking concepts: source/channel coding, queuing
theory, router design, network architectures (Intserv, DiffServ, MPLS),
multimedia protocols (TFRC, RTP), overlay networks, and wireless
standards (Bluetooth 802.11b, 3/4G). CROSSLISTED as CS 476/ECE 476
and CS 576/ECE 576.
Equivalent to: ECE 576
Recommended: (CS 372 or ECE 372) and (ECE 353 or ST 314 or ST 314H)
CS 578. CYBER-SECURITY. (4 Credits)
A broad overview of the field of computer and network security.
Essential cryptographic mechanisms such as symmetric and public-key
cryptography (e.g., encryption, signatures), network security and
authentication protocols (e.g., Kerberos, TLS, IPsec), system security
(e.g., access control, firewalls), advanced topics (e.g., searchable
encryption, cloud security, secure computation). CROSSLISTED as
CS 578/ECE 578.
Equivalent to: ECE 578
CS 579. TOPICS IN COMPUTER ARCHITECTURE AND PARALLEL
PROCESSING. (0-5 Credits)
Current topics in advanced computer architecture and parallel
processing.
This course is repeatable for 99 credits.
Recommended: CS 575 or CS 572 or ECE 572
CS 581. PROGRAMMING LANGUAGES I. (4 Credits)
Graduate-level introduction to functional programming and programming
language theory. Strongly typed functional programming in Haskell,
abstract syntax and grammars, interpreters, denotational semantics,
domain theory, and lambda calculus.
CS 582. PROGRAMMING LANGUAGES II. (4 Credits)
Essentials of programming language theory for understanding and
cconducting programming language research. Dependently typed
programming in Agda, Coq, or Idris; operational semantics; type systems;
unification and type inference.
Prerequisites: CS 581 with C or better
CS 583. ADVANCED FUNCTIONAL PROGRAMMING. (4 Credits)
Advanced functional programming concepts and strategies, with a focus
on techniques useful for the design and implementation of programming
languages. Includes higher-order abstract syntax, functors and monads,
generalized algebraic data types, functional data structures, and graph
reduction.
Prerequisites: CS 581 with C or better
CS 584. HUMAN FACTORS PROGRAMMING LANGUAGES. (4 Credits)
Principles and evaluation methods for designing and evaluating
programming languages to emphasize human productivity. Overall goals
are (a) to enable students to understand and apply these principles and
methods, and (b) to introduce at least four programming languages that
aim specifically at supporting human problem solving.
CS 585. DOMAIN-SPECIFIC LANGUAGES. (4 Credits)
Graduate-level introduction to the design and implementation of domain-specific
languages (DSLs). Domain analysis; review and revision of
language designs; binding constructs to support abstraction; definition of
syntax and semantics of DSLs; prototype implementation of embedded
DSL.
Prerequisites: CS 581 with C or better
CS 589. SELECTED TOPICS IN PROGRAMMING LANGUAGES. (1-5
Credits)
An in-depth examination of a specific topic of interest in programming
language design and implementation. Example topics include object-oriented
programming, parallel programming, compiler optimization,
programming language semantics.
This course is repeatable for 99 credits.
CS 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
CS 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.
CS 603. COMPUTER SCIENCE PHD THESIS. (1-16 Credits)
This course is repeatable for 99 credits.
CS 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
CS 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
CS 637. COMPUTER VISION II. (4 Credits)
An introduction to recent advances in visual recognition, including object
detection, semantic segmentation, multimodal parsing of images and
text, image captioning, face recognition, and human activity recognition.
The course covers common formulations of these problems, including
energy minimization on graphical models, and supervised machine
learning approaches to low- and high-level recognition tasks.
Prerequisites: CS 535 with B+ or better or CS 537 with B- or better
Recommended: CS 519

Electrical and Computer Engineering
ECE 111. INTRODUCTION TO ECE: TOOLS. (3 Credits)
Introduction to the electrical and computer engineering professional
practice. Covers the foundations of engineering problem solving and
other skills necessary for success. Students will be taught engineering
practice through hands-on approaches. Recommended for electrical and
computer engineering majors, and for those interested in engineering as a
profession. Lec/lab. Has extra fees.
Recommended: Completion or concurrent enrollment in MTH 111
ECE 112. INTRODUCTION TO ECE: CONCEPTS. (3 Credits)
Basic electrical and computer engineering concepts, problem solving and
hands-on laboratory project. Topics include electronic circuit and device
models, digital logic, circuit analysis, and simulation tools. Lec/lab. Has
extra fees.
Prerequisites: MTH 111 with C or better or MTH 112 with C or better
or MTH 251 with C or better or MTH 251H with C or better or Math
Placement Test with a score of 23
ECE 199. SPECIAL STUDIES. (0-16 Credits)
One-credit section. Graded P/N.
This course is repeatable for 16 credits.
Prerequisites: Boolean algebra, state machines, simplification of switching expressions, and introductory computer arithmetic. Lec/rec.

ECE 271. DIGITAL LOGIC DESIGN. (3 Credits)
A first course in digital logic design. Data types and representations, Boolean algebra, state machines, simplification of switching expressions, and introductory computer arithmetic. Lec/rec.
Prerequisites: MTH 251 (may be taken concurrently) with C or better or MTH 251H (may be taken concurrently) with C or better or MTH 231 (may be taken concurrently) with C or better

ECE 272. DIGITAL LOGIC DESIGN LABORATORY. (1 Credit)
This laboratory course accompanies ECE 271, Digital Logic Design. This also illustrates topics covered in the lectures of ECE 271 using computer-aided design, verification tools, and prototyping hardware.
Recommended: Completion or concurrent enrollment in ECE 271

ECE 322. ELECTRONICS I. (3 Credits)
Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.
Prerequisites: ENGR 203 with C or better
Equivalent to: ECE 322H

ECE 322H. ELECTRONICS I. (3 Credits)
Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.
Attributes:HNRS – Honors Course Designator
Prerequisites: ENGR 203 with C or better
Equivalent to: ECE 322

ECE 323. ELECTRONICS II. (3 Credits)
Transient operation of MOSFETs and bipolar transistors; multistage amplifiers; frequency response; feedback and stability.
Prerequisites: ECE 322 with C or better

ECE 331. ELECTROMECHANICAL ENERGY CONVERSION. (4 Credits)
Energy conversion principles for electric machines. Steady state characteristics of direct current, induction, and synchronous machines. Application of stepper and servo motors and synchronous generators.
Prerequisites: (ENGR 202 with C or better or ENGR 202H with C or better) and MTH 256 [C] and PH 213 [C]

ECE 332. LABORATORY ON ELECTROMECHANICAL ENERGY CONVERSION. (1 Credit)
DC, PMAC, and induction machine testing, operation, and control.
Prerequisites: ENGR 202 with C or better or ENGR 202H with C or better
Corequisites: ECE 331

ECE 341. JUNIOR DESIGN I. (3 Credits)
Introduction to system design and group projects. Design and fabrication of an electrical engineering project in a small group.
Prerequisites: CS 261 (may be taken concurrently) with C or better and ENGR 203 [C]

ECE 342. JUNIOR DESIGN II. (3 Credits)
Introduction to system design and group projects. Design and fabrication of an electrical engineering project in a small group.
Prerequisites: ECE 341 with C or better

ECE 351. SIGNALS AND SYSTEMS I. (3 Credits)
Analytical techniques for continuous-time and discrete-time signal, system, and circuit analysis. Lec.
Prerequisites: ENGR 203 with C or better and (MTH 256 [C] or MTH 256H [C])

ECE 352. SIGNALS AND SYSTEMS II. (3 Credits)
Analytical techniques for continuous-time and discrete-time signal, system, and circuit analysis.
Prerequisites: ECE 351 with C or better and (MTH 306 [C] or MTH 306H [C])

ECE 353. INTRODUCTION TO PROBABILITY AND RANDOM SIGNALS. (3 Credits)
Introductory discrete and continuous probability concepts, single and multiple random variable distributions, expectation, introductory stochastic processes, correlation and power spectral density properties of random signals, random signals through linear filters. Lec.
Prerequisites: ECE 351 with C or better and (MTH 254 [C] or MTH 254H [C])

ECE 372. INTRODUCTION TO COMPUTER NETWORKS. (4 Credits)
Computer network principles, fundamental networking concepts, packet-switching and circuit switching, TCP/IP protocol layers, reliable data transfer, congestion control, flow control, packet forwarding and routing, MAC addressing, multiple access techniques. CROSSTLISTED as CS 372/ ECE 372.
Prerequisites: CS 261 with C or better and (ECE 271 [C] or CS 271 [C])
Equivalent to: CS 372
Recommended: C programming and Unix familiarity.

ECE 375. COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING. (4 Credits)
Introduction to computer organization, how major components in a computer system function together in executing a program, and assembly language programming. Lec/lab.
Prerequisites: ECE 271 with C or better
Recommended: CS 261 or C/C++ programming

ECE 390. ELECTRIC AND MAGNETIC FIELDS. (4 Credits)
Static and quasi-static electric and magnetic fields.
Prerequisites: (MTH 255 with C or better or MTH 255H with C or better) and ENGR 203 (may be taken concurrently) [C] and PH 213 [C]

ECE 391. TRANSMISSION LINES. (3 Credits)
Transient and steady-state analysis of transmission line circuits with application to engineering problems.
Prerequisites: ECE 322 (may be taken concurrently) with C or better and ENGR 203 [C] and (MTH 254 [C] or MTH 254H [C]) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ECE 391X

ECE 399. SPECIAL TOPICS. (1-16 Credits)
Course work to meet students’ needs in advanced or specialized areas and to introduce new, important topics in electrical and computer engineering at the undergraduate (junior/senior) level.
Equivalent to: ECE 399H
This course is repeatable for 16 credits.

ECE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
ECE 411. ENGINEERING MAGNETICS. (3 Credits)
Application of magnetic materials in the design of magnetic devices. Properties of magnetic materials; engineering design of actuators, sensors and data storage devices. Introduction to spintronics.
Prerequisites: ECE 390 with C or better

ECE 413. SENSORS. (3 Credits)
Overview of sensor technologies including materials, physics of operation, applications and system integration.
Prerequisites: ECE 323 with C or better and PH 213 [C] and (CH 201 [C] or CH 231 [C]) or (CH 121 [C] and CH 122 [C]) or (CH 231 [C] and CH 261 [C])

ECE 415. MATERIAL SCIENCE OF NANOTECHNOLOGY. (3 Credits)
Introductory physical chemistry of solid surfaces, thermodynamics, and kinetics applied to synthesis of nanomaterials such as nanoparticles, nanowires, thin films, carbon nanotubes, fullerenes, graphene, etc. Characterization of nanomaterials, applications of nanomaterials, nanosynthesis techniques, integration of nanotechnology, and emerging nanotechnology topics.
Prerequisites: ECE 416 with C or better or ENGR 321 with C or better or ENGR 321H with C or better

ECE 416. ELECTRONIC MATERIALS AND DEVICES. (4 Credits)
Semiconductor fundamentals and physical principles of pn junctions and Schottky barrier diodes.
Prerequisites: ENGR 201 with C or better and PH 213 [C] and (CH 201 [C] or CH 231 [C]) or (CH 121 [C] and CH 122 [C]) or (CH 231 [C] and CH 261 [C])
Equivalent to: ECE 317

ECE 417. BASIC SEMICONDUCTOR DEVICES. (4 Credits)
Theory and physical principles of bipolar junction and field-effect transistors. Lec./rec.
Prerequisites: ECE 416 with C or better

ECE 418. SEMICONDUCTOR PROCESSING. (4 Credits)
Theory and practice of basic semiconductor processing techniques. Introduction to process simulation. Lec/lab/rec.
Prerequisites: ECE 416 with C or better

ECE 422. CMOS INTEGRATED CIRCUITS I. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; current mirrors, gain stages, single-ended operational amplifier, frequency response, and compensation.
Prerequisites: ECE 322 with C or better and ECE 323 (may be taken concurrently) [C]

ECE 423. CMOS INTEGRATED CIRCUITS II. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; cascaded current mirrors, cascaded gain stages, single-ended and fully differential operational amplifier, common-mode feedback, noise, and distortion. Lec/lab.
Prerequisites: ECE 422 with C or better

ECE 431. POWER ELECTRONICS. (4 Credits)
Fundamentals and applications of devices, circuits and controllers used in systems for electronic power processing. Lec/lab.
Prerequisites: ECE 322 with C or better and ECE 323 (may be taken concurrently) [C] and ECE 351 [C]

ECE 432. DYNAMICS OF ELECTROMECHANICAL ENERGY CONVERSION. (4 Credits)
Generalized machine theory. Techniques for dynamic analysis of electromechanical machines including arbitrary reference frame theory. Lec/lab.
Prerequisites: ECE 331 with C or better and ENGR 203 [C]
Corequisites: ECE 431

ECE 433. POWER SYSTEM ANALYSIS. (4 Credits)
Fundamentals and control of real and reactive power, steady-state load flow studies, unbalance, stability and transient system analysis.
Prerequisites: ECE 323 with C or better and ECE 352 [C] and (ENGR 202 [C] or ENGR 202H [C]) and MTH 254 [C] and MTH 306 [C]
Recommended: Three-phase power

ECE 437. SMART GRID. (3 Credits)
Fundamentals of smart power grids. Technology advances in transmission and distribution systems, policy drivers, assets and demand management, and smart grid security.
Prerequisites: ECE 433 with C or better
Recommended: Background in power systems analysis equivalent to ECE 433

ECE 438. ELECTRIC AND HYBRID ELECTRIC VEHICLES. (4 Credits)
Transportation electrification history, hybrid electric vehicle architecture, powertrain components and their modeling and control, vehicle system dynamics and controls.
Prerequisites: ECE 331 with C or better and ECE 431 [C]

ECE 441. *ENGINEERING DESIGN PROJECT. (3 Credits)
First term of an extended, 3-term team design project to expose students to problem situations and issues in engineering design similar to those encountered in industry. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECE 322 with C or better and ECE 351 [C] and ECE 342 [C]

ECE 442. *ENGINEERING DESIGN PROJECT. (3 Credits)
Second term of an extended, 3-term team design project to expose students to problem situations and issues in engineering design similar to those encountered in industry. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECE 441 with C or better

ECE 443. *ENGINEERING DESIGN PROJECT. (2 Credits)
An extended team design project to expose students to problem situations and issues in engineering design similar to those encountered in industry. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECE 442 with C or better

ECE 451. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSLISTED as ECE 451/ME 430.
Prerequisites: (ME 317 with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C]))
Equivalent to: ECE 452, ME 430, ME 430H

ECE 461. INTRODUCTION TO ANALOG AND DIGITAL COMMUNICATIONS. (4 Credits)
Fundamental concepts of analog and digital telecommunication systems: modeling, analysis, and design of analog amplitude and angle modulation systems; probabilistic performance assessment of modulated signals over noisy channels; introduction to baseband digital modulation techniques such as binary pulse amplitude modulation and pulse position modulation and their demodulation in the presence of random noise. Lec.
Prerequisites: ECE 351 with C or better and ECE 352 [C] and ECE 353 [C]
Prerequisites: ECE 461 with C or better and ECE 351 [C] and ECE 352 [C] and ECE 353 [C]

ECE 463. WIRELESS COMMUNICATIONS NETWORK. (4 Credits)
Wireless networks: personal area (IEEE 802.15.4a), local area (IEEE 802.11), metropolitan area (IEEE 802.16), and mobile cellular networks (e.g., CDMA); physical-layer techniques for data modulation and multiple access; RF system engineering aspects of mobile cellular networks (e.g., system capability for voice and packet data traffic, RF coverage for a certain propagation environment.) Lec.
Prerequisites: ECE 351 with C or better and ECE 352 [C]
Recommended: Probability background and ECE 461

ECE 464. DIGITAL SIGNAL PROCESSING. (4 Credits)
Analysis and design of discrete-time linear-time invariant systems for processing discrete-time signals: DT-LTI system properties, DT signal analysis using Discrete-Time Fourier Transform, Discrete Fourier Transform and z-Transform, frequency response and transfer function. Signal sampling and reconstruction, digital processing of continuous-time signals, FIR and IIR digital filter design, and filter structures.
Prerequisites: ECE 351 with C or better and ECE 352 [C]

ECE 468. DIGITAL IMAGE PROCESSING. (3 Credits)
Introduction to digital image processing including fundamental concepts of visual perception, image sampling and quantization, image enhancement in spatial and frequency domains (through 2D Fourier transform), image restoration, and color image processing. Implementation of algorithms using Matlab Image Processing Toolbox.
Prerequisites: ECE 351 with C or better and ECE 352 [C]

ECE 471. ENERGY-EFFICIENT VLSI DESIGN. (4 Credits)
Combinational and sequential logic design using CMOS transistors; analysis of power consumption and logic delay of digital logic; clock design including skew, jitter, and dynamic clock energy consumption; supply voltage and power supply noise sources; dynamic voltage frequency scaling (DVFS); sub-threshold logic design and effect on energy/robustness; custom digital integrated circuit design including transistor layouts and CAD entry; CMOS scaling and the effect on process variability and power consumption. Lec/lab.
Prerequisites: ECE 271 with C or better and ECE 322 [C] and ECE 323 (may be taken concurrently) [C]

ECE 472. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/ ECE 472 and CS 572/ECE 572.
Prerequisites: ECE 375 with C or better
Equivalent to: CS 472

ECE 473. MICROCONTROLLER SYSTEM DESIGN. (4 Credits)
Implementation of embedded computer systems focusing on the development of hardware and software for an embedded microcontroller system. Topics include internal microcontroller architecture, interfacing peripheral devices, mixed analog and digital systems, and hardware and software implementation of several systems using a microcontroller and peripherals. Lec/lab.
Prerequisites: ECE 322 with C or better and ECE 375 [C]

ECE 474. VLSI SYSTEM DESIGN. (4 Credits)
Introduction to custom and semi-custom digital integrated circuit design as used in VLSI systems. The use of CAD/CAE tools, design management, and design methodology are introduced.
Prerequisites: ECE 322 with C or better and ECE 375 [C]

ECE 476. ADVANCED COMPUTER NETWORKING. (4 Credits)
Prerequisites: (CS 372 with C or better or ECE 372 with C or better) and (ECE 353 [C] or ST 314 [C] or ST 314H [C])
Equivalent to: CS 476, EECS 476

ECE 477. MULTIMEDIA SYSTEMS. (4 Credits)
Design of multimedia systems used in information technology covering the hardware, software, applications, and networks. Components covered include multimedia representation, coding and compression techniques, wireless networks, networking for multimedia, and embedded systems for multimedia. Lec.
Recommended: ECE 375

ECE 478. NETWORK SECURITY. (4 Credits)
Basic concepts and techniques in network security, risks and vulnerabilities, applied cryptography and various network security protocols. Coverage of high-level concepts such as authentication, confidentiality, integrity, and availability applied to networking systems. Fundamental techniques including authentication protocols, group key establishment and management, trusted intermediaries, public key infrastructures, SSL/TLS, IPsec, firewalls and intrusion detection CROSSLISTED as CS 478/ECE 478.
Prerequisites: CS 372 with C or better or ECE 372 with C or better
Equivalent to: CS 478
Recommended: CS 370

ECE 482. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: PH 482
Recommended: ECE 391 or (PH 481 or PH 581)

ECE 483. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Prerequisites: ECE 391 (may be taken concurrently) with C or better or PH 481 (may be taken concurrently) with C or better
Equivalent to: PH 483

ECE 484. ANTENNAS AND PROPAGATION. (4 Credits)
Introduction to antennas and radiowave propagation. Offered alternate years.
Prerequisites: (ECE 390 with C or better and ECE 391 [C])
ECE 485. MICROWAVE DESIGN TECHNIQUES. (4 Credits)
Introduction to basic design techniques required for the design of high-frequency circuits and systems. Lec/Lab.
Prerequisites: ECE 390 with C or better and ECE 391 [C]

ECE 499. SPECIAL TOPICS. (0-16 Credits)
Course work to meet students' needs in advanced or specialized areas and to introduce new important topics in electrical and computer engineering at the undergraduate level.
This course is repeatable for 16 credits.

ECE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 503. ECE MS THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

ECE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ECE 510. OCCUPATIONAL INTERNSHIP. (1-4 Credits)
This course is repeatable for 99 credits.

ECE 516. ELECTRONIC MATERIALS AND DEVICES. (4 Credits)
Semiconductor fundamentals and physical principles of pn junctions and Schottky barrier diodes.
Equivalent to: ECE 317
Recommended: ENGR 201

ECE 517. BASIC SEMICONDUCTOR DEVICES. (4 Credits)
Theory and physical principles of bipolar junction and field-effect transistors. Lec/rec.
Recommended: ECE 416

ECE 518. SEMICONDUCTOR PROCESSING. (4 Credits)
Theory and practice of basic semiconductor processing techniques.
Introduction to process simulation. Lec/lab/rec.
Recommended: ECE 416

ECE 520. ANALOG CMOS INTEGRATED CIRCUITS. (4 Credits)
Principles and techniques of design of electronic circuits with focus on a design methodology for analog integrated circuits. Practical aspects of using CAD tools in analyzing and laying out circuits will be discussed.

ECE 521. ANALOG CIRCUIT SIMULATION. (4 Credits)
Formulation/solution of circuit equations; sparse matrix techniques; DC, transient, sensitivity, noise and Fourier analyses; RF circuit simulation.
Recommended: ECE 423 or ECE 520

ECE 522. CMOS INTEGRATED CIRCUITS I. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; current mirrors, gain stages, single-ended operational amplifier, frequency response, and compensation.
Recommended: ECE 322 and completion or concurrent enrollment in ECE 323

ECE 523. CMOS INTEGRATED CIRCUITS II. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; cascaded current mirrors, cascaded gain stages, single-ended and fully differential operational amplifier, common-mode feedback, noise, and distortion. Lec/lab.
Recommended: ECE 422 or ECE 622

ECE 530. CONTEMPORARY ENERGY APPLICATIONS. (4 Credits)
Contemporary energy issues and applications; fundamental physics of renewable energy sources (e.g. wind, wave, and solar), devices used to harvest energy from these sources, state-of-the-art renewable energy technology, power transmission, transformers, and energy storage.
Recommended: Matlab, basic circuit analysis with RLC components and diode

ECE 531. POWER ELECTRONICS. (4 Credits)
Fundamentals and applications of devices, circuits and controllers used in systems for electronic power processing. Lec/lab.
Recommended: ECE 322 and ECE 351 and completion or concurrent enrollment in ECE 323

ECE 532. DYNAMICS OF ELECTROMECHANICAL ENERGY CONVERSION. (4 Credits)
Generalized machine theory. Techniques for dynamic analysis of electromechanical machines including arbitrary reference frame theory. Lec/lab.
Corequisites: ECE 531
Recommended: ECE 331

ECE 533. POWER SYSTEM ANALYSIS. (4 Credits)
Fundamentals and control of real and reactive power, steady-state load flow studies, unbalance, stability and transient system analysis.
Recommended: ECE 323 and ECE 352 and three-phase power

ECE 534. ADVANCED ELECTRICAL MACHINES. (3 Credits)
Development of models for the dynamic performance of all classes of electrical machines; synchronous, induction, permanent magnet and reluctance motors. Dynamic motor simulations.
Equivalent to: ECE 538
Recommended: ECE 530

ECE 535. ADJUSTABLE SPEED DRIVES AND MOTION CONTROL. (3 Credits)
Adjustable speed drives, associated power electronic converters, simulation and control. Lec.
Equivalent to: ECE 647
Recommended: ECE 530

ECE 536. POWER SYSTEM PROTECTION. (3 Credits)
Recommended: ECE 433 or ECE 533

ECE 537. SMART GRID. (3 Credits)
Fundamentals of smart power grids. Technology advances in transmission and distribution systems, policy drivers, assets and demand management, and smart grid security.
Recommended: Background in power systems analysis equivalent to ECE 433

ECE 538. ELECTRIC AND HYBRID ELECTRIC VEHICLES. (4 Credits)
Transportation electrification history, hybrid electric vehicle architecture, powertrain components and their modeling and control, vehicle system dynamics and controls.
Equivalent to: ECE 534
Recommended: ECE 331 and ECE 431

ECE 550. LINEAR SYSTEMS. (4 Credits)
Linear dynamic systems theory and modeling.
Recommended: ECE 351 and ECE 352
ECE 560. STOCHASTIC SIGNALS AND SYSTEMS. (4 Credits)
Stochastic processes, correlation functions, spectral analysis applicable to communication and control systems.
Recommended: ECE 461 or ECE 561

ECE 561. INTRODUCTION TO ANALOG AND DIGITAL COMMUNICATIONS. (4 Credits)
Fundamental concepts of analog and digital telecommunication systems: modeling, analysis, and design of analog amplitude and angle modulation systems; probabilistic performance assessment of modulated signals over noisy channels; introduction to baseband digital modulation techniques such as binary pulse amplitude modulation and pulse position modulation and their demodulation in the presence of random noise. Lec.
Recommended: ECE 351 and ECE 352 and ECE 353

ECE 562. DIGITAL COMMUNICATIONS AND CHANNEL CODING. (4 Credits)
Modeling, analysis, design of baseband and passband digital communications systems: geometric representation of signals; correlator receivers for M-ary digital communications systems; decision theory and its application to digital communication systems in additive white Gaussian noise environment; generation, transmission, and reception of passband digital modulated signals (BPSK, QPSK, FSK, PAM); basics of information theory and channel encoding. Lec.
Recommended: ECE 461 and ECE 351 and ECE 352 and ECE 353

ECE 563. WIRELESS COMMUNICATIONS NETWORK. (4 Credits)
Wireless networks: personal area (IEEE 802.15.4a), local area (IEEE 802.11), metropolitan area (IEEE 802.16), and mobile cellular networks (e.g., CDMA); physical-layer techniques for data modulation and multiple access; RF system engineering aspects of mobile cellular networks (e.g., system capability for voice and packet data traffic, RF coverage for a certain propagation environment.) Lec.
Recommended: Probability background and ECE 461

ECE 564. DIGITAL SIGNAL PROCESSING. (4 Credits)
Analysis and design of discrete-time linear-time invariant systems for processing discrete-time signals: DT-LTI system properties, DT signal analysis using Discrete-Time Fourier Transform, Discrete Fourier Transform and z-Transform, frequency response and transfer function. Signal sampling and reconstruction, digital processing of continuous-time signals, FIR and IIR digital filter design, and filter structures.
Recommended: ECE 351 and ECE 352

ECE 565. ESTIMATION, FILTERING, AND DETECTION. (4 Credits)
Principles of estimation, linear filtering, and detection.
Recommended: ECE 353

ECE 566. INFORMATION THEORY. (4 Credits)
Introduction to information theory: entropy, differential entropy, entropy rates, mutual information, data compression, channel capacity, source coding, channel coding, network information theory.
Recommended: ECE 353 and strong mathematical background

ECE 569. CONVEX OPTIMIZATION. (4 Credits)
Introduces the fundamental concepts, theories of convex and nonconvex optimization, and the algorithmic solutions as well as applications to many research disciplines including signal processing, networking, communications, and machine learning. Emphasis will be on (i) convex analysis and optimality conditions, (ii) first-order large-scale algorithms (gradient, proximal gradient, ADMM, Frank-Wolfe, stochastic gradient, block coordinate descent), and (iii) convergence analysis.
Recommended: Linear algebra and ECE 599 Matrix Analysis for Signal Processing

ECE 570. HIGH PERFORMANCE COMPUTER ARCHITECTURE. (4 Credits)
Advanced concepts in computer architecture. Performance improvement employing advanced pipelining and multiple instruction scheduling techniques. Issues in memory hierarchy and management. CROSSLISTED as CS 570/ECE 570.
Equivalent to: CS 570
Recommended: ECE 472 or ECE 572

ECE 571. ENERGY-EFFICIENT VLSI DESIGN. (4 Credits)
Combinational and sequential logic design using CMOS transistors; analysis of power consumption and logic delay of digital logic; clock design including skew, jitter, and dynamic clock energy consumption; supply voltage and power supply noise sources; dynamic voltage frequency and scaling (DVFS); sub-threshold logic design and effect on energy/robustness; custom digital integrated circuit design including transistor layouts and CAD entry; CMOS scaling and the effect on process variability and power consumption. Lec/lab.
Recommended: ECE 573
Recommended: ECE 271 and ECE 322 and completion or concurrent enrollment in ECE 323 (all with a minimum grade of C)

ECE 572. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/ ECE 472 and CS 572/ECE 572.
Equivalent to: CS 572
Recommended: ECE 351 and ECE 352 and CS 261

ECE 574. VLSI SYSTEM DESIGN. (4 Credits)
Introduction to custom and semi-custom digital integrated circuit design as used in VLSI systems. The use of CAD/CAE tools, design management, and design methodology are introduced.
Recommended: ECE 322 or ECE 375

ECE 575. DATA SECURITY AND CRYPTOGRAPHY. (3 Credits)
Secret-key and public-key cryptography, authentication and digital signatures, protocols, implementation issues, privacy enhanced mail, data and communication security standards.

ECE 576. ADVANCED COMPUTER NETWORKING. (4 Credits)
Equivalent to: CS 372, ECE 372 and (ECE 353 or ST 314 or ST 314H)
ECE 577. MULTIMEDIA SYSTEMS. (4 Credits)
Design of multimedia systems for information technology covering the hardware, software, applications, and networks. Components covered include multimedia representation, coding and compression techniques, wireless networks, networking for multimedia, and embedded system for multimedia. Lec.
Recommended: ECE 375
Equivalent to: CS 578

ECE 578. CYBER-SECURITY. (4 Credits)
A broad overview of the field of computer and network security. Essential cryptographic mechanisms such as symmetric and public-key cryptography (e.g., encryption, signatures), network security and authentication protocols (e.g., Kerberos, TLS, IPsec), system security (e.g., access control, firewalls), advanced topics (e.g., searchable encryption, cloud security, secure computation). CROSSLISTED as CS 578/ECE 578.
Equivalent to: CS 578

ECE 580. NETWORK THEORY. (4 Credits)
Linear graphs, multiport networks, and other topics in advanced network theory.

ECE 582. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: PH 582
Recommended: PH 481 or PH 581

ECE 583. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Equivalent to: PH 583
Recommended: Completion or concurrent enrollment in (ECE 391 or PH 481 or PH 581)

ECE 584. ANTENNAS AND PROPAGATION. (4 Credits)
Introduction to antennas and radiowave propagation. Offered alternate years.

ECE 585. MICROWAVE DESIGN TECHNIQUES. (4 Credits)
Introduction to basic design techniques required for the design of high-frequency circuits and systems. Lec/Lab.

ECE 590. ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC FIELDS. (4 Credits)
Basic analytical techniques required to solve meaningful field problems in engineering.

ECE 591. ADVANCED ELECTROMAGNETICS. (3 Credits)
Advanced techniques for analyzing problems in electromagnetics, primarily numerical. Offered alternate years.
Recommended: ECE 590

ECE 593. RF MICROWAVE CIRCUIT DESIGN. (3 Credits)
Active/passive RF and microwave circuit design with emphasis to wireless systems.
Recommended: ECE 390 and ECE 391

ECE 599. SPECIAL TOPICS. (0-16 Credits)
Course work to meet students’ needs in advanced or specialized areas and to introduce new important topics in electrical and computer engineering at the graduate level.
This course is repeatable for 99 credits.

ECE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 603. ECE PhD THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

ECE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 611. ELECTRONIC MATERIALS PROCESSING. (3 Credits)
Technology, theory, and analysis of processing methods used in integration circuit fabrication. Offered alternate years. CROSSLISTED as CHE 611/ECE 611.
Equivalent to: CHE 611, ECE 611

ECE 612. PROCESS INTEGRATION. (3 Credits)
Process integration, simulation, and statistical quality control issues related to integrated circuit fabrication. Offered alternate years. CROSSLISTED as CHE 612/ECE 612.
Equivalent to: CHE 612, ECE 512
Recommended: ECE 611 or CHE 611

ECE 613. ELECTRONIC MATERIALS AND CHARACTERIZATION. (3 Credits)
Physics and chemistry of electronic materials and methods of materials characterization. Offered alternate years. CROSSLISTED as CHE 613/ECE 613.
Equivalent to: CHE 613, ECE 513

ECE 614. SEMICONDUCTORS. (3 Credits)
Essential aspects of semiconductor physics relevant for an advanced understanding of semiconductor materials and devices. Offered alternate years.
Equivalent to: ECE 514
Recommended: Exposure to quantum mechanics and solid state physics.

ECE 615. SEMICONDUCTOR DEVICES I. (3 Credits)
Advanced treatment of two-terminal semiconductor electronic devices. Offered alternate years.
Equivalent to: ECE 515
Recommended: ECE 614

ECE 616. SEMICONDUCTOR DEVICES II. (3 Credits)
Advanced treatment of three-terminal semiconductor electronic devices. Offered alternate years.
Equivalent to: ECE 516
Recommended: ECE 615

ECE 617. THIN FILM TRANSISTORS. (4 Credits)
Thin-film electronics typically necessitate semiconducting materials lacking long-range order (disordered semiconductors), and hence provide a range of challenges and opportunities for device engineers. Provides a comprehensive review of the device physics and materials science of thin film electronics – in particular thin-film transistors. Provides students with the theoretical and practical knowledge to be successful in the development and study of thin film transistors, in both academic and industrial environments.
Recommended: ECE 390, ECE 416/ECE516, ECE 417/ECE 517, ECE 614

ECE 619. SELECTED TOPICS IN SOLID STATE. (3 Credits)
Special courses taught on various topics in solid state as interests and demands vary.
This course is repeatable for 99 credits.
ECE 621. RADIO FREQUENCY IC DESIGN. (3 Credits)
Radio frequency (RF) circuits. Principles, analysis, and design of bipolar and MOS RF IC building blocks: low noise amplifiers, mixers, oscillators, frequency synthesizers.
Recommendation: (ECE 422 or ECE 522) and (ECE 423 or ECE 523) or ECE 520

ECE 626. ANALOG CMOS CIRCUIT DESIGN. (3 Credits)
Switched-capacitor circuit design, on-chip filters, data converters. Practical aspects of analog CMOS IC design.

ECE 627. OVERSAMPLED DELTA-SIGMA DATA CONVERTERS. (3 Credits)
Noise-shaping theory in first, second, and higher-order modulators. Design, simulation, and realization in hardware of converters using this popular architecture.

ECE 629. SELECTED TOPICS IN MICROELECTRONICS. (3 Credits)
Course work to meet student’s needs in advanced or specialized areas and to introduce the newest important results in microelectronics.

ECE 659. SELECTED TOPICS IN SYSTEMS AND CONTROL. (3 Credits)
Course work to meet student’s needs in advanced or specialized areas and to introduce the newest important results in systems and control.
This course is repeatable for 18 credits.

ECE 669. SELECTED TOPICS IN COMMUNICATIONS AND SIGNAL PROCESSING. (3 Credits)
Course work to meet student’s needs in advanced or specialized areas and to introduce the newest important results in signal processing.
This course is repeatable for 18 credits.

ECE 679. SELECTED TOPICS IN COMPUTER ENGINEERING. (1-16 Credits)
Topics to be presented at various times include information storage and retrieval, computer architecture, fault-tolerant computing, asynchronous sequential circuits, automata, data transmission, coding theory.
This course is repeatable for 99 credits.

ECE 699. SPECIAL TOPICS. (3 Credits)
Advanced studies in field and wave theories and special devices. Topic examples are microwave and acoustic devices, advanced lasers and masers, electron beam interactions with traveling waves, MHD device dynamics.
This course is repeatable for 99 credits.

Humanitarian Engineering Science and Technology

HEST 199. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 241. HOUSEHOLD ENERGY IN GUATEMALA: BACKGROUND. (1 Credit)
An introduction to the technical, social, environmental, and economic issues surrounding energy needs for households in developing countries and the technologies and policies needed to help address them. Students are introduced to concepts about global development, needs assessment and co-design, qualitative and quantitative evaluation, and local socioeconomic conditions. This course is preparation for the 10-day Summer HEST 242 faculty-led study abroad course in Guatemala. Students from any major are invited to participate in this multidisciplinary course series.

HEST 242. HOUSEHOLD ENERGY IN GUATEMALA: APPLICATIONS. (3 Credits)
Through immersion in rural communities during this 10-day interdisciplinary study abroad course, students will gain a deeper understanding of household energy needs in developing countries, as well as the social, environmental, technical, and economic issues surrounding technologies and polices to help meet these needs. The outcomes produced by a variety of household technologies such as biomass cookstoves will be evaluated through qualitative and quantitative data gathering, including experiments, observations, and surveys, giving students the chance to practice their research and cross-cultural communication skills under a variety of circumstances.
Recommendation: HEST 241

HEST 299. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 301. *INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN. (3 Credits)
Includes study of civic problems and issues, design-thinking concepts and application to co-design of engineering, science and technology-based solutions with social impact, and development of dispositions for effective community engagement through field study and service-learning. Recommended course for student wanting to complete a HEST internship. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 320. *ENGINEERING FOR GLOBAL HEALTH SOLUTIONS. (3 Credits)
An introduction to the critical processes and drivers involved in the development of engineering solutions to address global health problems. Topics include world health challenges, accessing and interpreting health and economic data, basic healthcare systems around the world, the importance of ethical guidelines in ensuring the protection of human subjects, the process of cost effectiveness assessment of a technology, and the timescale and hurdles to adoption of a technology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 399. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 411. ENGINEERING DESIGN FOR EMERGENCY & LOW-RESOURCE ENVIRONMENTS. (3 Credits)
Introduces the challenges of engineering in emergency and low-resource environments, concepts of appropriate technologies and response, and engineering design of discrete services and technologies such as water systems, environmental health systems and infrastructure.
Recommendation: Completion of an undergraduate engineering fluid mechanics course

HEST 412. *MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY. (3 Credits)
Introduces students to multidisciplinary methods and perspectives applied to case studies in humanitarian engineering, science and technology. Applications to real world issues with global implications at the interface of humanity and nature are addressed from a systems perspective using a case study approach.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 499. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.
HEST 511. ENGINEERING DESIGN FOR EMERGENCY & LOW-RESOURCE ENVIRONMENTS. (3 Credits)
Introduces the challenges of engineering in emergency and low-resource environments, concepts of appropriate technologies and response, and engineering design of discrete services and technologies such as water systems, environmental health systems and infrastructure. Recommended: Completion of an undergraduate engineering fluid mechanics course

HEST 512. MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY. (3 Credits)
Introduces students to multidisciplinary methods and perspectives applied to case studies in humanitarian engineering, science and technology. Applications to real world issues with global implications at the interface of humanity and nature are addressed from a systems perspective using a case study approach.

HEST 541. HOUSEHOLD ENERGY IN GUATEMALA: BACKGROUND. (1 Credit)
An introduction to the technical, social, environmental, and economic issues surrounding energy needs for households in developing countries and the technologies and policies needed to help address them. Students are introduced to concepts about global development, needs assessment and co-design, qualitative and quantitative evaluation, and local socioeconomic conditions. This course is preparation for the 10-day Summer HEST 542 faculty-led study abroad course in Guatemala. Students from any major are invited to participate in this multidisciplinary course series.

HEST 542. HOUSEHOLD ENERGY IN GUATEMALA: APPLICATIONS. (3 Credits)
Through immersion in rural communities during this 10-day interdisciplinary study abroad course, students will gain a deeper understanding of household energy needs in developing countries, as well as the social, environmental, technical, and economic issues surrounding technologies and policies to help meet these needs. The outcomes produced by a variety of household technologies such as biomass cookstoves will be evaluated through qualitative and quantitative data gathering, including experiments, observations, and surveys, giving students the chance to practice their research and cross-cultural communication skills under a variety of circumstances. Recommended: HEST 541

HEST 599. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

Software Engineering
SE 199. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
SE 201. SOFTWARE DEVELOPMENT I. (4 Credits)
Introduction to collaborative software development of larger, object-oriented systems. Overview of software architecture, and the tools, principles and practice of modern software development. Prerequisites: CS 162 with C or better
SE 299. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
SE 303. SOFTWARE ENGINEERING III. (4 Credits)
Introduction to refactoring techniques and improving the quality and maintainability of software. Applying continuous integration and deployment tools; containers and virtual development environments. Prerequisites: CS 362 with C or better

SE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
SE 467. BUSINESS OF SOFTWARE II. (4 Credits)
Become an entrepreneur. Start a real software business, from ideation to sales. Real-world, hands-on learning in a fast-paced startup environment. Development of product ideas, hypotheses, and business models to discover customers. Teamwork, management, and positioning for investment. Prerequisites: SE 466 with C or better
SE 468. BUSINESS OF SOFTWARE III. (4 Credits)
Become an entrepreneur. Start a real software business, from ideation to sales. Real-world, hands-on learning in a fast-paced startup environment. Development of product ideas, hypotheses, and business models to discover customers. Teamwork, management, and positioning for investment. Prerequisites: SE 467 with C or better
SE 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

Computer Science Graduate Major (MA, MENG, MS, PhD)
Graduate Areas of Concentration
Algorithms and cryptography; artificial intelligence, machine learning and data science; computer graphics, visualization, and vision; computer systems and networking; human-computer interaction; programming languages; software engineering

See EECS website (http://eecs.oregonstate.edu/research/) for complete information.

The master’s program provides advanced instruction beyond the undergraduate degree. It prepares students for careers in which a higher level of experience is required. The PhD program prepares students for work in government or industry research laboratories or industry research laboratories or for careers at universities.

Additional areas of concentration may be arranged with other departments, for example, numerical analysis or computer algebra with the Department of Mathematics.

For additional information, contact the EECS Graduate Program Coordinator, phone 541-737-3617 or email eecs.gradinfo@oregonstate.edu.

Additional information concerning courses, advising, procedures, faculty and many other aspects of the program may be found on the school’s website (http://eecs.oregonstate.edu/future-students/graduate/research-interest-areas/).

Major Code: 3070

MEng

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<td>Required Core</td>
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<td>Select at least 2 courses each out of 3 topic areas **</td>
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<td>Electives</td>
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**MS (Project)**

- **Required Core**: Select at least 2 courses each out of 3 topic areas **
- **Electives**: Courses chosen by the student which may include up to 6 credits from the following:
  - CS 501 RESEARCH
  - CS 505 READING AND CONFERENCE
- **Thesis/Project Support Courses**: A coherent set of 3 or more courses giving preparation and support for the student's thesis or project 4
- **Project**: CS 506 PROJECTS

**Total Hours**: 45

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**MS (Thesis)**

- **Required Core**: Select at least 2 courses each out of 3 topic areas **
- **Electives**: Courses chosen by the student which may include up to 6 credits from the following:
  - CS 501 RESEARCH
  - CS 505 READING AND CONFERENCE
- **Thesis/Project Support Courses**: A coherent set of 3 or more courses giving preparation and support for the student's thesis or project 5
- **Thesis**: CS 503 COMPUTER SCIENCE MS THESIS

**Total Hours**: 9

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**PhD**

- **Required Core**: Select at least 2 courses each out of 3 topic areas **
- **Theory**: CS 515 ALGORITHMS AND DATA STRUCTURES, CS 517 THEORY OF COMPUTATION
- **Electives**: Courses chosen by the student which may include up to 15 credits from the following:
  - CS 501 RESEARCH
  - CS 505 READING AND CONFERENCE
- **Thesis**: CS 603 COMPUTER SCIENCE PHD THESIS

**Total Hours**: 45

---

**++ Topic Areas**

- **Theoretical Computer Science**
  - CS 515 ALGORITHMS AND DATA STRUCTURES (required for PhD so not eligible as topic area course): 4
  - CS 516 THEORY OF COMPUTATION AND FORMAL LANGUAGES: 4
  - CS 517 THEORY OF COMPUTATION (required for PhD so not eligible as topic area course): 4
  - CS 520 GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE: 3
  - CS 521 COMPUTABILITY: 4
  - CS 523 ADVANCED ALGORITHMS: 4
  - CS 524 NP-COMPLETE AND HARDER PROBLEMS: 4
  - CS 527 ERROR-CORRECTING CODES: 4
  - CS 529 SELECTED TOPICS IN THEORETICAL COMPUTER SCIENCE: 1-5
- **Artificial Intelligence**
  - CS 531 ARTIFICIAL INTELLIGENCE: 4
  - CS 532 ADVANCED ARTIFICIAL INTELLIGENCE: 4
  - CS 533 INTELLIGENT AGENTS AND DECISION MAKING: 4
  - CS 534 MACHINE LEARNING: 4
  - CS 535 DEEP LEARNING: 4
  - CS 536 PROBABILISTIC GRAPHICAL MODELS: 4
  - CS 537 COMPUTER VISION I: 3
  - CS 539 SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE: 1-5
- **Computer Systems**
  - CS 540 DATABASE MANAGEMENT SYSTEMS: 4
  - CS 544 OPERATING SYSTEMS II: 4
  - CS 546 NETWORKS IN COMPUTATIONAL BIOLOGY: 3
  - CS 549 SELECTED TOPICS ON DATA SCIENCE & SYSTEMS: 1-5
  - CS 570 HIGH PERFORMANCE COMPUTER ARCHITECTURE: 4
  - CS 572 COMPUTER ARCHITECTURE: 4
  - CS 575 INTRODUCTION TO PARALLEL PROGRAMMING: 4
  - CS 576 ADVANCED COMPUTER NETWORKING: 4
  - CS 578 CYBER-SECURITY: 4
  - CS 579 TOPICS IN COMPUTER ARCHITECTURE AND PARALLEL PROCESSING: 1-5
- **ECE 573 MICROCONTROLLER SYSTEM DESIGN: 4**
- **ECE 574 VLSI SYSTEM DESIGN: 4**
- **ECE 575 DATA SECURITY AND CRYPTOGRAPHY: 3**
- **ECE 577 MULTIMEDIA SYSTEMS: 4**
- **Programming Languages**
  - CS 581 PROGRAMMING LANGUAGES I: 4
  - CS 582 PROGRAMMING LANGUAGES II: 4
  - CS 583 ADVANCED FUNCTIONAL PROGRAMMING: 4
  - CS 584 HUMAN FACTORS PROGRAMMING LANGUAGES: 4
  - CS 585 DOMAIN-SPECIFIC LANGUAGES: 4
  - CS 589 SELECTED TOPICS IN PROGRAMMING LANGUAGES: 1-5
- **Software Engineering**
  - CS 560 DATA-DRIVEN SOFTWARE ENGINEERING: 4
  - CS 561 SOFTWARE ENGINEERING METHODS: 4
  - CS 562 SOFTWARE PROJECT MANAGEMENT: 4
  - CS 563 SOFTWARE MAINTENANCE AND EVOLUTION: 4
  - CS 569 SELECTED TOPICS IN SOFTWARE ENGINEERING: 1-5
- **Human Computer Interaction**
  - CS 564 FIELD STUDIES IN SE AND HCI: 4
  - CS 565 HUMAN-COMPUTER INTERACTION: 4
  - CS 567 LABORATORY STUDIES IN SE AND HCI: 4
  - CS 568 INCLUSIVE DESIGN (HCI): 4
  - ROB 567 HUMAN ROBOT INTERACTION: 4
- **Computer Vision and Graphics**
  - CS 550 INTRODUCTION TO COMPUTER GRAPHICS: 4
  - CS 551 COMPUTER GRAPHICS: 4
  - CS 552 COMPUTER ANIMATION: 4
  - CS 553 SCIENTIFIC VISUALIZATION: 4
  - CS 554 GEOMETRIC MODELING IN COMPUTER GRAPHICS: 4
  - CS 555 SIGNAL AND IMAGE PROCESSING: 4
  - CS 556: 4
  - CS 557 COMPUTER GRAPHICS SHADERS: 4
Prerequisite and Corequisite Coursework
All graduate students in Computer Science must achieve a B grade (or equivalent) in the following courses, or courses deemed equivalent to these courses by the program director, and must be taken either prior to or during your graduate studies:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 321</td>
<td>INTRODUCTION TO THEORY OF COMPUTATION</td>
<td>3</td>
</tr>
<tr>
<td>CS 325</td>
<td>ANALYSIS OF ALGORITHMS</td>
<td>4</td>
</tr>
<tr>
<td>CS 444</td>
<td>OPERATING SYSTEMS II</td>
<td>4</td>
</tr>
<tr>
<td>or CS 472</td>
<td>COMPUTER ARCHITECTURE</td>
<td></td>
</tr>
<tr>
<td>CS 381</td>
<td>PROGRAMMING LANGUAGE FUNDAMENTALS</td>
<td>4</td>
</tr>
<tr>
<td>or CS 480</td>
<td>TRANSLATORS</td>
<td></td>
</tr>
</tbody>
</table>

1. At least a 3.0 GPA must be achieved over these six courses. Other courses may be used instead of the courses above to satisfy this requirement by approval of the student’s committee.
2. 1 term of CS 507-001 (EECS Colloquium) with a minimum C grade in the first year of study. This seminar cannot be used toward the program of study.
3. 3 terms of CS 507-001 (EECS Colloquium) with a minimum C grade in the first year of study. This seminar cannot be used on the program of study.
4. The selection of courses will be made in consultation with, and must be approved by, the student’s major professor. 2 of the 6 courses used to satisfy the above requirement may also be used to satisfy this one.

Major Code: 3070

Computer Science Graduate Minor

The School of Electrical Engineering & Computer Science offers graduate minor degrees in Computer Science. The Graduate minor in Computer Science is for masters and doctoral level students who seek additional formal training and mentoring in computer science.

For more details, contact the EECS Graduate Program Coordinator, 541-737-3617 or eecs.gradinfo@oregonstate.edu

Minor Code: 3070

Master's program minors must include a minimum of 15 quarter credits of graduate course work as approved by the minor faculty advisor. Doctoral minors must include a minimum of 18 quarter credits of graduate course work as approved by the minor faculty advisor. Additional credits may be required as determined by the minor faculty advisor or advising committee.

Minor Code: 3070

Computer Science Minor

Also available at OSU-Cascades and Ecampus.

Computing has become pervasive, touching nearly every aspect of our lives. A minor in Computer Science can open up opportunities for employment in the software development industry, but also in many areas including healthcare, business, science, medicine, graphics, utilities and education. Courses will teach theory, problem-solving skills, and programming.

Minor Code: 249

To earn the minor upon graduation, students must meet all of the following:

1. Earn a C in each of their minor courses (all courses must be taken A–F grading)
2. Have a minimum 2.25 GPA in all required minor course work (36 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Division Requirements</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CS 161</td>
<td>INTRODUCTION TO COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>CS 162</td>
<td>INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>CS 261</td>
<td>DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CS 271</td>
<td>COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 231</td>
<td>ELEMENTS OF DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>or CS 225</td>
<td>DISCRETE STRUCTURES IN COMPUTER SCIENCE</td>
<td></td>
</tr>
</tbody>
</table>

Upper Division Requirements | 3, 4, 5 |
| CS 362| SOFTWARE ENGINEERING II                       | 4     |
| Select 12 credits from the following recommended electives: | 12     |
| CS 344| OPERATING SYSTEMS I                           |       |
| CS 352| INTRODUCTION TO USABILITY ENGINEERING        |       |
| CS 361| SOFTWARE ENGINEERING I                        |       |
| CS 440| DATABASE MANAGEMENT SYSTEMS                   |       |
| CS 475| INTRODUCTION TO PARALLEL PROGRAMMING          |       |
| CS 492| MOBILE SOFTWARE DEVELOPMENT                   |       |
| The following cannot be used for minor requirements: |       |
| CS 391| SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE |       |
| CS 395| WEBSITE MULTIMEDIA                            |       |
| CS 401| RESEARCH                                      |       |
| CS 405| READING AND CONFERENCE                        |       |
| CS 407| SEMINAR                                       |       |
| CS 410| OCCUPATIONAL INTERNSHIP                       |       |
| CS 461| SENIOR SOFTWARE ENGINEERING PROJECT I         |       |
| CS 462| SENIOR SOFTWARE ENGINEERING PROJECT II        |       |
| CS 463| SENIOR SOFTWARE ENGINEERING PROJECT           |       |
| CS 495| INTERACTIVE MULTIMEDIA PROJECTS               |       |
| Total Hours | 36     |

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1. Students may declare the Computer Science minor after completing the required lower-division courses with a GPA of 2.25 or higher and after becoming eligible to take 300-level courses in their major. Please speak with an EECS advisor to declare the minor.
2. Electrical and Computer Engineering (ECE) students who wish to minor in Computer Science must take ECE 271 and ECE 272 instead of CS 271.
3. Electrical and Computer Engineering (ECE) students will take ECE 375 and CS 372/ECE 372 plus 4 credits of upper-division computer science courses.
4. Electrical and Computer Engineering (ECE) students can take the following courses that will count both as an ECE restrictive elective for the ECE major and as well as towards the CS minor: CS 344, CS 325, CS 331, CS 444, CS 434, CS 450, CS 472/ ECE 472, CS 476/ECE 476.
5. Other upper-division courses are acceptable. Please speak with an advisor about which courses might create the best path for your goals.

Minor Code: 249

Computer Science Undergraduate Major (BA, BS, HBA, HBS)

Also available at OSU-Cascades and via Ecampus.

The computer science (CS) undergraduate curriculum has the following Program Educational Objectives (PEOs) (see the ABET Accreditation for CS website).

1. Graduates of the program will have successful careers.
2. Graduates of the program will continue to learn and adapt to a changing world.
3. Graduates of the program will practice ethical and inclusive principles that foster collaborative environments.

Entering undergraduate students must choose and complete options 1 or 2 to earn a degree in CS. Entering post-baccalaureate students may select options 1 and 2 that are offered on campus or the online Computer Science Double Degree option offered by Ecampus.

1. Applied Computer Science (BA, BS, HBA, HBS) - on campus and via Ecampus
2. Computer Systems (BA, BS, HBA, HBS) - on campus only
3. Computer Science Double Degree (BS, HBS) - via Ecampus only

For students entering the undergraduate program, the recommended high school preparation is four years of mathematics, science, and English. High school programming or computer applications courses should not be taken in place of other college preparatory courses.

Major Code: 307

Each option has its own requirements. Please select a specific option for details.

Major Code: 307

Applied Computer Science Option

This option is offered within the following major(s):

- Computer Science - College of Engineering (p. 454)

Also available at OSU-Cascades and via Ecampus.

The Applied Computer Science option is for students who want to combine the study of computer science with an in-depth examination of a field in which computer science plays an important role. This option requires an approved program of study for each student. Students build their own program of study to include their choice of CS electives plus an Applied CS program. The Computer Science Undergraduate Curriculum Committee reviews these programs of study for approval. Existing OSU minors may be proposed for use both as an Applied CS program and as a minor.

Option Code: 354

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Baccalaureate Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS</td>
<td>1</td>
</tr>
<tr>
<td>Biological Science Course</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Perspective (Physical Science)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Perspective (Second Biology plus Lab or Physical Science)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Perspectives Course (Western Culture)</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Perspectives Course (Cultural Diversity)</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Perspectives Course (Literature &amp; Arts)</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Perspectives Course (Social Processes and Institutions)</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Synthesis Course (Contemporary Global Issues)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Difference, Power, and Discrimination Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Unrestricted Electives</td>
<td>4-12</td>
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<td>Total BCC courses required</td>
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<tbody>
<tr>
<td>Required Courses</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>CS 160</td>
<td>COMPUTER SCIENCE ORIENTATION</td>
<td>3</td>
</tr>
<tr>
<td>CS 161</td>
<td>INTRODUCTION TO COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>CS 162</td>
<td>INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>or CS 165</td>
<td>ACCELERATED INTRODUCTION TO COMPUTER SCIENCE</td>
<td></td>
</tr>
<tr>
<td>CS 261</td>
<td>DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CS 271</td>
<td>COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE</td>
<td>4</td>
</tr>
<tr>
<td>CS 290</td>
<td>WEB DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>MTH 231</td>
<td>ELEMENTS OF DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>or CS 225</td>
<td>DISCRETE STRUCTURES IN COMPUTER SCIENCE</td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>WR 214</td>
<td>*WRITING IN BUSINESS</td>
<td>3</td>
</tr>
<tr>
<td>or WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>ST 314</td>
<td>INTRODUCTION TO STATISTICS FOR ENGINEERS</td>
<td>3</td>
</tr>
<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
<td>3</td>
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<td>Total Hours</td>
<td>50</td>
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<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>College and Major Requirements</td>
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</tr>
<tr>
<td>CS 325</td>
<td>ANALYSIS OF ALGORITHMS</td>
<td>4</td>
</tr>
<tr>
<td>CS 340</td>
<td>INTRODUCTION TO DATABASES</td>
<td>4</td>
</tr>
<tr>
<td>CS 344</td>
<td>OPERATING SYSTEMS I</td>
<td>4</td>
</tr>
<tr>
<td>CS 352</td>
<td>INTRODUCTION TO USABILITY ENGINEERING</td>
<td>4</td>
</tr>
<tr>
<td>CS 361</td>
<td>SOFTWARE ENGINEERING I</td>
<td>4</td>
</tr>
<tr>
<td>CS 362</td>
<td>SOFTWARE ENGINEERING II</td>
<td>4</td>
</tr>
<tr>
<td>CS 372/CE 372</td>
<td>INTRODUCTION TO COMPUTER NETWORKS</td>
<td>4</td>
</tr>
<tr>
<td>CS 381</td>
<td>PROGRAMMING LANGUAGE FUNDAMENTALS</td>
<td>4</td>
</tr>
<tr>
<td>CS 391</td>
<td>*SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE</td>
<td>3</td>
</tr>
<tr>
<td>CS 444</td>
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<tr>
<td>CS 461</td>
<td>*SENIOR SOFTWARE ENGINEERING PROJECT I</td>
<td>3</td>
</tr>
<tr>
<td>CS 462</td>
<td>*SENIOR SOFTWARE ENGINEERING PROJECT II</td>
<td>3</td>
</tr>
<tr>
<td>CS 463</td>
<td>SENIOR SOFTWARE ENGINEERING PROJECT</td>
<td>2</td>
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<tr>
<td>Applied Program</td>
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<td></td>
</tr>
<tr>
<td>Computer Science Restricted Elective</td>
<td>3-4</td>
<td></td>
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<tr>
<td>Computer Science Restricted Elective</td>
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<tr>
<td>Select a minimum of 32 credits</td>
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<td>Total credits required for graduation</td>
<td>180</td>
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</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
Computer Science Double Degree Option

This option is offered within the following major(s):

- Computer Science - College of Engineering (p. 454)

Available only via Ecampus.

The Computer Science Double Degree option is for students who want to combine a bachelor’s degree in computer science with a bachelor’s degree in another field. Since computer science is relevant in so many diverse disciplines, students can obtain a computer science degree in combination with virtually any other degree. Those who already hold a bachelor’s degree—a BA or BS—from an accredited institution can add to their existing skill set and enhance their job prospects by earning a computer science degree online from OSU. The program of study includes the core courses in computer science, and also includes courses at the leading edge of computing technologies, software design, web development, and mobile/cloud computing.

All of the courses in the Double Degree option are offered through Ecampus, and most of the courses are also offered on-campus. This degree requires students to be enrolled as online students selecting DSC-Distance Degree Corvallis as their campus.

Students who choose the Computer Science Double Degree option may pursue a degree in computer science concurrently while earning a second bachelor’s degree, or may pursue the computer science degree as a post-baccalaureate degree.

Option Code: 297

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 160</td>
<td>COMPUTER SCIENCE ORIENTATION</td>
<td>3</td>
</tr>
<tr>
<td>CS 161</td>
<td>INTRODUCTION TO COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>or CS 165</td>
<td>ACCELERATED INTRODUCTION TO COMPUTER SCIENCE</td>
<td>4-8</td>
</tr>
<tr>
<td>CS 162</td>
<td>INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>or CS 165</td>
<td>ACCELERATED INTRODUCTION TO COMPUTER SCIENCE</td>
<td>4-8</td>
</tr>
<tr>
<td>CS 225</td>
<td>DISCRETE STRUCTURES IN COMPUTER SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 231</td>
<td>ELEMENTS OF DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>CS 261</td>
<td>DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CS 271</td>
<td>COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE</td>
<td>4</td>
</tr>
<tr>
<td>CS 290</td>
<td>WEB DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>CS 325</td>
<td>ANALYSIS OF ALGORITHMS</td>
<td>4</td>
</tr>
<tr>
<td>CS 340</td>
<td>INTRODUCTION TO DATABASES</td>
<td>4</td>
</tr>
<tr>
<td>CS 344</td>
<td>OPERATING SYSTEMS I</td>
<td>4</td>
</tr>
<tr>
<td>CS 361</td>
<td>SOFTWARE ENGINEERING I</td>
<td>4</td>
</tr>
<tr>
<td>CS 362</td>
<td>SOFTWARE ENGINEERING II</td>
<td>4</td>
</tr>
<tr>
<td>CS 467</td>
<td>ONLINE CAPSTONE PROJECT</td>
<td>4</td>
</tr>
</tbody>
</table>

 restricted electives

Select 3 electives for a minimum of 12 credits

Total Hours 60-68

1 CS 300 – 400 level courses offered online, excluding the required CS courses for the double degree and CS 410

Option Code: 297

Computer Systems Option

This option is offered within the following major(s):

- Computer Science - College of Engineering (p. 454)

The Computer Systems option is for students who want to take up computer science as a career and seek an in-depth understanding of computer science as an academic discipline. This option provides excellent preparation for those who plan to work for companies developing systems software or embedded systems. It also provides excellent preparation for those who plan to pursue an MS or PhD in computer science.

Option Code: 334

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>CS 160</td>
<td>COMPUTER SCIENCE ORIENTATION</td>
<td>3</td>
</tr>
<tr>
<td>CS 161</td>
<td>INTRODUCTION TO COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>CS 162</td>
<td>INTRODUCTION TO COMPUTER SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>or CS 165</td>
<td>ACCELERATED INTRODUCTION TO COMPUTER SCIENCE</td>
<td>4-8</td>
</tr>
<tr>
<td>CS 261</td>
<td>DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CS 290</td>
<td>WEB DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>ECE 271</td>
<td>DIGITAL LOGIC DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>ECE 272</td>
<td>DIGITAL LOGIC DESIGN LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td>MTH 231</td>
<td>ELEMENTS OF DISCRETE MATHEMATICS (Ecampus only)</td>
<td>4</td>
</tr>
<tr>
<td>or CS 225</td>
<td>DISCRETE STRUCTURES IN COMPUTER SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 306</td>
<td>MATRIX AND POWER SERIES METHODS</td>
<td>4</td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
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<tr>
<td>PH 221</td>
<td>RECITATION FOR PHYSICS 211</td>
<td>1</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
</tbody>
</table>

required courses

Additional Major Requirements

PH 212 | *GENERAL PHYSICS WITH CALCULUS & PH 213 and *GENERAL PHYSICS WITH CALCULUS | 8     |
PH 222 & PH 223 | RÉCITATION FOR PHYSICS 212 and RÉCITATION FOR PHYSICS 213 | 2     |
ST 314 | INTRODUCTION TO STATISTICS FOR ENGINEERS   | 3     |
WR 214 | *WRITING IN BUSINESS                       | 3     |
or WR 222 | *ENGLISH COMPOSITION                       | 3     |
WR 327 | *TECHNICAL WRITING                         | 3     |

Total Hours 79-83

Other Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>CS 321</td>
<td>INTRODUCTION TO THEORY OF COMPUTATION</td>
<td>3</td>
</tr>
<tr>
<td>CS 325</td>
<td>ANALYSIS OF ALGORITHMS</td>
<td>4</td>
</tr>
<tr>
<td>CS 340</td>
<td>INTRODUCTION TO DATABASES</td>
<td>4</td>
</tr>
<tr>
<td>CS 344</td>
<td>OPERATING SYSTEMS I</td>
<td>4</td>
</tr>
<tr>
<td>CS 361</td>
<td>SOFTWARE ENGINEERING I</td>
<td>4</td>
</tr>
<tr>
<td>CS 362</td>
<td>SOFTWARE ENGINEERING II</td>
<td>4</td>
</tr>
<tr>
<td>CS 372</td>
<td>INTRODUCTION TO COMPUTER NETWORKS</td>
<td>4</td>
</tr>
<tr>
<td>CS 381</td>
<td>PROGRAMMING LANGUAGE FUNDAMENTALS</td>
<td>4</td>
</tr>
<tr>
<td>CS 391</td>
<td>*SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE</td>
<td>3</td>
</tr>
<tr>
<td>CS 444</td>
<td>OPERATING SYSTEMS II</td>
<td>4</td>
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<tr>
<td>CS 461</td>
<td>*SENIOR SOFTWARE ENGINEERING PROJECT I</td>
<td>3</td>
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Option Code: 297
CyberSecurity Certificate

Also available at OSU-Portland and via Ecampus.

As computer systems have become part of the fabric of modern society, system security has grown essential to the well-being of individuals, companies, the economy, and life as we know it. A single security breach can expose passwords, financial data and private personal information of hundreds of millions of people. This Undergraduate Certificate in Cybersecurity enables students to understand common threats to system security, assess security requirements for a new or existing system, implement secure solutions to counter threats, and evaluate systems to identify and address weaknesses. These skills will support future careers as cybersecurity analyst, cybersecurity engineer, information assurance technician, and security administrator. In addition, these skills will enable students to perform other jobs, such as software engineer and requirements analyst, with a higher level of proficiency and a lower risk of creating security flaws that threaten their users, their employers, their livelihoods, and their nation.

For more information, visit the School of Electrical Engineering and Computer Science (https://eecs.oregonstate.edu/).

Certificate Code: C300

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CS 370</td>
<td>INTRODUCTION TO SECURITY</td>
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<tr>
<td>CS 373</td>
<td>DEFENSE AGAINST THE DARK ARMS</td>
<td>4</td>
</tr>
<tr>
<td>CS 427</td>
<td>CRYPTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>CS 477</td>
<td>INTRODUCTION TO DIGITAL FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>CS 478</td>
<td>NETWORK SECURITY</td>
<td>4</td>
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<tr>
<td>BA 482</td>
<td>INFORMATION SECURITY GOVERNANCE</td>
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<td></td>
<td>Electives</td>
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<tr>
<td>BA 480</td>
<td>INFORMATION SYSTEMS SECURITY</td>
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</tr>
<tr>
<td>CS 434</td>
<td>MACHINE LEARNING AND DATA SECURITY</td>
<td></td>
</tr>
<tr>
<td>CS 454</td>
<td>OPEN SOURCE SOFTWARE</td>
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</tr>
<tr>
<td>CS 475</td>
<td>INTRODUCTION TO PARALLEL MINING</td>
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</tr>
<tr>
<td>CS 492</td>
<td>MOBILE SOFTWARE DEVELOPMENT</td>
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</tr>
<tr>
<td>CS 493</td>
<td>CLOUD APPLICATION DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>CS 496</td>
<td>MOBILE AND CLOUD SOFTWARE DEVELOPMENT</td>
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</tr>
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Total Hours: 27

Option Code: 334

Certificate Code: C300

Electrical and Computer Engineering Graduate Major (MENG, MS, PhD)

Graduate Areas of Concentration

Analog and mixed signal, artificial intelligence and machine learning; communications and signal processing; computer systems; energy systems; materials and devices; RF/microwaves/optoelectronics

See EECS website (http://eecs.oregonstate.edu/research/) for complete information.

The School of Electrical and Computer Engineering offers graduate programs leading to MEng, MS, and PhD degrees focusing on the major areas listed below. The MS and MEng programs provide advanced instruction beyond the undergraduate degree. They prepare students for careers in which a higher level of experience is required. The MEng degree is a course work-only degree with no required thesis or project report. The PhD program prepares students for work in government or industry research laboratories or careers at universities. Students are encouraged to develop programs of study in close cooperation with the faculty members in their areas of interest.

Graduate work is supported by the school's well-equipped laboratory facilities. Opportunities exist for graduate students to participate in many research projects sponsored by private industry and government agencies.

For more information, contact the EECS Graduate Program Coordinator, School of Electrical Engineering and Computer Science, OSU, Corvallis, OR 97331-5501; 541-737-3617; email: eecs.gradinfo@oregonstate.edu

Additional information concerning courses, advising procedures, faculty, and many other aspects of the school may be found on the school’s website (http://eecs.oregonstate.edu/).

Major Code: 3110
### MEng

<table>
<thead>
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</tr>
<tr>
<td></td>
<td>Select 3 courses from the following:</td>
<td>11-12</td>
</tr>
<tr>
<td>ECE 520</td>
<td>ANALOG CMOS INTEGRATED CIRCUITS</td>
<td></td>
</tr>
<tr>
<td>ECE 530</td>
<td>CONTEMPORARY ENERGY APPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>ECE 550</td>
<td>LINEAR SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>ECE 560</td>
<td>STOCHASTIC SIGNALS AND SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>ECE 570</td>
<td>HIGH PERFORMANCE COMPUTER ARCHITECTURE</td>
<td></td>
</tr>
<tr>
<td>ECE 580</td>
<td>NETWORK THEORY</td>
<td></td>
</tr>
<tr>
<td>ECE 590</td>
<td>ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FIELDS</td>
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</tr>
<tr>
<td>ECE 614</td>
<td>SEMICONDUCTORS</td>
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<table>
<thead>
<tr>
<th>Engineering Electives</th>
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<tbody>
<tr>
<td>Graduate standalone credits offered by the Electrical and Computer Engineering program, or other technical courses approved by the program committee</td>
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<table>
<thead>
<tr>
<th>Other Electives</th>
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<tbody>
<tr>
<td>Courses chosen by the student which may include up to 6 credits from the following:</td>
</tr>
<tr>
<td>ECE 501</td>
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<td>ECE 505</td>
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<table>
<thead>
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### MS (Thesis)

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<td>Select 3 courses from the following:</td>
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<tr>
<td>ECE 520</td>
<td>ANALOG CMOS INTEGRATED CIRCUITS</td>
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<tr>
<td>ECE 530</td>
<td>CONTEMPORARY ENERGY APPLICATIONS</td>
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</tr>
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<td>ECE 550</td>
<td>LINEAR SYSTEMS</td>
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</tr>
<tr>
<td>ECE 560</td>
<td>STOCHASTIC SIGNALS AND SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>ECE 570</td>
<td>HIGH PERFORMANCE COMPUTER ARCHITECTURE</td>
<td></td>
</tr>
<tr>
<td>ECE 580</td>
<td>NETWORK THEORY</td>
<td></td>
</tr>
<tr>
<td>ECE 590</td>
<td>ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC</td>
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<td></td>
<td>FIELDS</td>
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<tr>
<td>ECE 614</td>
<td>SEMICONDUCTORS</td>
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<thead>
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<th>Engineering Electives</th>
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<table>
<thead>
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<td>Courses chosen by the student which may include up to 6 credits from the following:</td>
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<tr>
<td>ECE 501</td>
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### PhD

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<tr>
<td>ECE 520</td>
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<td>ECE 530</td>
<td>CONTEMPORARY ENERGY APPLICATIONS</td>
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<td>ECE 550</td>
<td>LINEAR SYSTEMS</td>
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<tr>
<td>ECE 560</td>
<td>STOCHASTIC SIGNALS AND SYSTEMS</td>
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<td>ECE 570</td>
<td>HIGH PERFORMANCE COMPUTER ARCHITECTURE</td>
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<tr>
<td>ECE 580</td>
<td>NETWORK THEORY</td>
<td></td>
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<tr>
<td>ECE 590</td>
<td>ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC</td>
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<td></td>
<td>FIELDS</td>
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<tr>
<td>ECE 614</td>
<td>SEMICONDUCTORS</td>
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<table>
<thead>
<tr>
<th>Engineering Electives</th>
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<tbody>
<tr>
<td>Graduate standalone credits offered by the Electrical and Computer Engineering program, or other technical courses approved by the program committee</td>
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<table>
<thead>
<tr>
<th>Other Electives</th>
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<td>Courses chosen by the student which may include up to 15 credits from the following:</td>
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<tr>
<td>ECE 605</td>
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<table>
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<td>ECE 603</td>
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<thead>
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### Prerequisite and Corequisite Coursework for Non-engineering Undergraduates

MEng or MS students without undergraduate degrees in Electrical Engineering or Electrical and Computer Engineering must complete 1 course from at least four of the following topic areas:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Topic Area 1</strong></td>
<td></td>
</tr>
<tr>
<td>ECE 390</td>
<td>ELECTRIC AND MAGNETIC FIELDS</td>
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<td>ECE 590</td>
<td>ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC</td>
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<td>FIELDS</td>
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<table>
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<tr>
<th>Topic Area 2</th>
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<tr>
<td>ECE 322</td>
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<tr>
<td>ECE 422</td>
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<td>ECE 520</td>
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<table>
<thead>
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<th>Topic Area 3</th>
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<tbody>
<tr>
<td>ECE 323</td>
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<td>ECE 423</td>
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<th>Topic Area 4</th>
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<tr>
<td>ECE 351</td>
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<tr>
<td>ECE 451</td>
</tr>
<tr>
<td>ECE 461</td>
</tr>
<tr>
<td></td>
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<td>ECE 550</td>
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<table>
<thead>
<tr>
<th>Topic Area 5</th>
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<tr>
<td>ECE 352</td>
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</table>
Electrical and Computer Engineering Graduate Minor

The School of Electrical Engineering & Computer Science offers graduate minor degrees in Electrical & Computer Engineering. The Graduate minor in Electrical & Computer Engineering is for masters and doctoral level students who seek additional formal training and mentoring in electrical and computer engineering.

For more details, contact the EECS Graduate Program Coordinator, 541-737-3617, or eecs.gradinfo@oregonstate.edu

Major Code: 3110

Electrical and Computer Engineering Undergraduate Major (BS, HBS)

The curriculum in Electrical and Computer Engineering (ECE) provides a wide range of opportunities in undergraduate study in the electrical engineering areas of communications, signal processing and controls, electronics and integrated circuits, power electronics and energy systems, materials and devices, electromagnetism, microwaves and optics, and the computer engineering areas of computer architecture, digital hardware design, and computer networks.

The Bachelor of Science and Honors Bachelor of Science degree programs in ECE are accredited by the Computing Accreditation Commission of ABET, http://www.abet.org. The ECE undergraduate program has the following Program Educational Objectives (PEOs) (see the ABET Accreditation for ECE website (http://eecs.oregonstate.edu/about-eecs/accreditation/electrical-computer-engineering/)).

1. Graduates of the program will have successful careers.
2. Graduates of the program will continue to learn and adapt to a changing world.
3. Graduates of the program will practice ethical and inclusive principles that foster collaborative environments.

The ECE undergraduate degree program includes a common set of core courses that provides a solid foundation as well as 29-credits of restricted electives. The restricted electives allow students to prepare for industry, graduate study, or other career paths, specializing or broadening further their knowledge and skills. Elective course work is available focusing on sustainability and renewable energy, computers and networks, energy systems, integrated circuits, systems signals and communications, materials and devices, RF/microwaves and optoelectronics, and robotics. The sustainability and renewable energy focus addresses global technological challenges balancing societal needs with environmental and economic tradeoffs. Further details on restricted electives can be found on the EECS website (http://eecs.oregonstate.edu/).

Major Code: 039

Except as approved by the ECE curriculum committee, the 29 credits of restricted electives must include either CS 344 or ECE 390, plus four ECE 400-level electives and one additional 400-level elective from the approved list.

The ECE curriculum has been designed to meet the following minimum requirements, which still must be met if specific courses are waived:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>mathematics and basic sciences</td>
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<tr>
<td>engineering science and design</td>
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<td>Upper-division courses</td>
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<td>Total credits required for graduation</td>
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Non-MECOP Sample Program for ECE Majors

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<tr>
<td>First Year</td>
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<tr>
<td>CH 201 or CH 231</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3-4</td>
</tr>
<tr>
<td>or CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>COMM 111 or COMM 114</td>
<td>*PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCOURSE</td>
<td>3</td>
</tr>
<tr>
<td>CS 161</td>
<td>INTRODUCTION TO COMPUTER SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>CS 162</td>
<td>INTRODUCTION TO COMPUTER SCIENCE II</td>
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<tr>
<td>ECE 111</td>
<td>INTRODUCTION TO ECE: TOOLS</td>
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<tr>
<td>ECE 112</td>
<td>INTRODUCTION TO ECE: CONCEPTS</td>
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</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
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<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any FAC course)</td>
<td>1-2</td>
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<tr>
<td>MTH 231</td>
<td>ELEMENTS OF DISCRETE MATHEMATICS</td>
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</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
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Second Year

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<tr>
<th>Biological Science course with lab</th>
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CS 261  DATA STRUCTURES 2  4
ECE 271  DIGITAL LOGIC DESIGN 2  3
ECE 272  DIGITAL LOGIC DESIGN LABORATORY 2  1
ENGR 201  ELECTRICAL FUNDAMENTALS I  3
ENGR 202  ELECTRICAL FUNDAMENTALS II  3
ENGR 203  ELECTRICAL FUNDAMENTALS III 2  3
MTH 255  VECTOR CALCULUS II  4
MTH 256  APPLIED DIFFERENTIAL EQUATIONS  4
MTH 306  MATRIX AND POWER SERIES METHODS  4
PH 211  GENERAL PHYSICS WITH CALCULUS  4
PH 212  GENERAL PHYSICS WITH CALCULUS  4
PH 213  GENERAL PHYSICS WITH CALCULUS  4

Third Year
ECE 322  ELECTRONICS I  3
ECE 323  ELECTRONICS II  3
ECE 341  JUNIOR DESIGN I  3
ECE 342  JUNIOR DESIGN II  3
ECE 351  SIGNALS AND SYSTEMS I  3
ECE 352  SIGNALS AND SYSTEMS II  3
ECE 353  INTRODUCTION TO PROBABILITY AND RANDOM SIGNALS  3
ECE 372/CS 372  INTRODUCTION TO COMPUTER NETWORKS 1  4
ECE 375  COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING  4
ECE 391  TRANSMISSION LINES 1  3

Restricted Elective 1
ECE 390  ELECTRIC AND MAGNETIC FIELDS  4
or CS 344  OPERATING SYSTEMS I
Contemporary Global Issues course 3  3
WR 327  TECHNICAL WRITING  3

Fourth Year
CS 391  SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE  3
ECE 441  ENGINEERING DESIGN PROJECT
& ECE 442  and ENGINEERING DESIGN PROJECT
& ECE 443  and ENGINEERING DESIGN PROJECT
Perspectives course 3  3
Restricted Electives: Select four approved 400-level ECE courses 1  12-16
Restricted Electives: Select one approved 400-level course 1  3-4
Select 5-10 credits of approved Restricted Electives 1  5-10
Credits to meet graduation requirement of 180  5

Total Hours  45

Baccalaureate Core Course (BCC)
Writing Intensive Course (WIC)
1 Must be selected from approved restricted elective list
2 Prerequisite for required upper-division courses
3 Must be selected to satisfy the requirements of the baccalaureate core

Current List of Restricted Electives

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CH 411</td>
<td>INORGANIC CHEMISTRY</td>
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</tr>
<tr>
<td>CHE 444</td>
<td>THIN FILM MATERIALS PROCESSING</td>
<td>4</td>
</tr>
<tr>
<td>CHE 499</td>
<td>SPECIAL TOPICS (Conventional Alternative Energy Systems)</td>
<td>3</td>
</tr>
<tr>
<td>CS 325</td>
<td>ANALYSIS OF ALGORITHMS</td>
<td>4</td>
</tr>
<tr>
<td>CS 331</td>
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Major Code: 039

School of Mechanical, Industrial, and Manufacturing Engineering

The School of Mechanical, Industrial, and Manufacturing Engineering (MIME) at OSU offers undergraduate degrees in Mechanical Engineering,
Industrial Engineering, and Manufacturing Engineering at the Corvallis campus and Energy Systems Engineering at the OSU-Cascades campus.

The Bachelor of Science and Honors Bachelor of Science degrees in Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The Bachelor of Science and Honors Bachelor of Science degrees in Industrial Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The Bachelor of Science and Honors Bachelor of Science degrees in Manufacturing Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The Bachelor of Science and Honors Bachelor of Science degrees in Energy Systems Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The mission of the School of MIME is two-fold:

- To prepare our students as entrepreneurial, team-oriented, work-ready graduates and lifelong learners in mechanical, industrial and manufacturing engineering, and
- To engage in collaborative, cutting-edge research whose applications lead to greater prosperity and a sustainable future for Oregon and the world.

MIME Program Objectives

ABET (http://www.ABET.org) requires that each program establishes educational objectives defined as ‘broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.” While each program has specific objectives, all MIME programs’ program objectives may be summarized by the following statements in three broad areas of student participation and graduate achievement:

1. Our graduates will be systems thinkers. MIME graduates will be able to analyze, evaluate, improve, and design engineered systems and processes using modern engineering tools (hardware and software) and approaches. They will demonstrate in-depth knowledge of mechanical, industrial and/or manufacturing systems.

2. Our graduates will be global collaborators. MIME graduates will be able to communicate effectively across disciplines and cultures. They will provide management and leadership skills within their organizations and work effectively in diverse environments.

3. Our graduates will be innovative designers and problem solvers. MIME graduates will use both structured and unstructured methodologies to innovate systems and processes. They will apply technical knowledge and creativity in solving real-world problems. They will demonstrate a sound understanding of engineering and project management fundamentals and breadth of experience with engineering design and problem-solving processes.

Mechanical Engineering

Mechanical engineers design and develop small devices, large equipment, and processes for society. They play major roles in the design, testing and operation of mechanisms, machines, and systems, including processes for energy conversion and equipment used in households, businesses, transportation, and manufacturing.

In addition to the university baccalaureate core, the mechanical engineering curriculum has its base in mathematics, science, engineering science, and design. Mathematics and science courses occur primarily in the first two years. Engineering science is a major component, which is treated from the sophomore year to graduation in a combination of required and technical elective sources.

OSU’s Mechanical Engineering Program has all the attributes needed for the best learning environment: ABET accredited curriculum, excellent faculty, modern facilities, quality students, and strong industrial interaction.

Engineering design is an integral element of the program. The philosophy is to ‘plant the seed’ for design at the freshman level and grow it throughout the program. Most of the skills are developed at the junior and senior levels when students have achieved proficiency in the basic technical requirements. At the junior level, the design process is extensively developed in three courses. At the senior year, design experiences occur in several areas, culminating in the two-term senior project in which students in small teams carry out the design of some product or process under the supervision of a faculty advisor. Attention to hands-on activity adds a very desirable ‘feel’ for many aspects of the design process.

A good choice of senior electives enables students to achieve a degree of specialization and depth to match their interests. The areas include applied stress analysis; design, dynamics, and analysis of mechanical and thermal/fluid systems; concurrent engineering; control system design; mechatronics; heat transfer; and metallurgy and materials.

The faculty encourages a vibrant extracurricular program for professional and leadership experiences. Students are encouraged to obtain at least three months of work experience through an industrial or research internship or to participate in a foreign exchange program. The school’s goal is to have more than 95 percent of its students graduate with such experience. In addition to students having general internships, many of the professional-level students participate in the industry-driven Multiple Engineering Cooperative Program (MECOP). This program provides two paid six-month internships at over 60 Pacific Northwest companies where interns work with a company mentor and improve their capabilities for the work environment.

Mechanical engineers can be found in a wide variety of industries including aerospace, electronics, biomedical, transportation, manufacturing, energy, automotive, and government labs. Because of the increasing complexity of mechanical engineering, graduate study for the MS and PhD degrees is advisable for students who wish to specialize in depth in any of the above areas. The undergraduate curriculum provides an excellent foundation for graduate study.

Industrial Engineering

Industrial engineers (IEs) apply science, mathematics, and engineering methods to complex system integration and operation. Because the systems with which they work are often large and complex, IEs utilize knowledge and skills in a wide variety of disciplines, have the ability to work well with people, and take a broad, systems perspective. The Industrial Engineering degree is a very flexible degree that allows students to tailor their program of study to meet their individual career goals. A large number of restricted elective credits allows students to
pursue the Business Engineering option or to customize their program to a field of interest.

IEs are key players in the integration and operation of systems in all sectors of industry and government including the following (with examples):

- aerospace (NASA space shuttle pre-launch processing systems)
- automotive (automobile final assembly plants)
- communications (telephone services)
- computers (factory information systems)
- electronics/semiconductors (silicon wafer fabrication facilities)
- food (canneries and fast food restaurant chains)
- government (department of motor vehicles service centers)
- health care (hospital central stores and operating rooms)
- manufacturing (circuit board fabrication facilities)
- retail (product distribution centers)
- transportation (airlines, overnight delivery services)

In their role as system integrators, IEs analyze and design systems. For example:

- facilities layout,
- material handling systems,
- manufacturing and other production systems,
- information systems,
- individual and group workplaces.

In the operations realm, IEs analyze, design and manage processes. For example:

- manufacturing processes-service processes,
- production system planning and control,
- resource allocation and scheduling,
- personnel assignment and scheduling,
- quality assurance,
- inventory control,
- system and personnel safety.

**Energy Systems Engineering**

Energy systems engineers oversee complex energy conversion and distribution systems, work to improve energy storage systems, and manage the efficient use of energy in building, manufacturing, and processing systems. ESE professionals also study the secondary effects of energy usage from a local environmental impact, regional and national economic impact, and global climate change perspective.

Energy systems engineers pursue a variety of jobs and occupations. For example, they might be hired to do any of the following:

- Manage operations of a wind turbine farm
- Analyze efficiency of hydroelectric power systems
- Oversee production of innovative fuel-cell technologies
- Evaluate the economic viability of new solar power installations
- Assess the environmental impact of alternative energy systems

**Manufacturing Engineering**

The Manufacturing Engineering degree is a more specialized degree, focusing on both high-tech manufacturing and traditional manufacturing. In particular, it is a specialization of industrial engineering that focuses on the making of physical products. The Manufacturing Engineering degree offers a hands-on education, and manufacturing engineering students are encouraged to participate in the college's MECOP program, a nationally recognized industrial cooperative education program.

Students who complete the requirements for the Manufacturing Engineering degree plus 32 additional credits (at least 16 of these credits must be from the list of industrial engineering restricted electives) can earn two separate degrees, one in manufacturing engineering and the other in industrial engineering. The additional 32 credits typically take two additional quarters to complete.

**Undergraduate Programs**

**Majors**

- Energy Systems Engineering (p. 478)
- Industrial Engineering (p. 481)
  - **Option:**
    - Business Engineering
  - Manufacturing Engineering (p. 483)
  - **Options:**
    - Manufacturing Systems
    - Product Development
    - Mechanical Engineering (p. 490)

**Minor**

- Aerospace Engineering (p. 478)
- Humanitarian Engineering (p. 398)
- Materials Science (p. 487)

**Graduate Programs**

**Majors**

- Industrial Engineering (p. 479)
  - **Options:**
    - Advanced Manufacturing
    - Engineering Management
    - Human Systems Engineering


- Information Systems Engineering
- Manufacturing Systems Engineering
- Materials Science (p. 486)
- Mechanical Engineering (p. 488)

**Prerequisites:**
- Advanced Manufacturing
- Design
- Engineering Management
- Materials Mechanics
- Renewable Energy
- Robotics
- Thermal Fluids
- Robotics (p. 491)

**Minors**
- Industrial Engineering (p. 481)
- Materials Science (p. 487)
- Mechanical Engineering (p. 490)
- Robotics (p. 491)

**Certificate**
- Engineering Management (p. 479)

David Blunck, David Porter, Harriet Nembhard, Head

David Blunck, Associate Head for Graduate Programs
David Blunck, Associate Head for Undergraduate Programs

204 Rogers Hall
Oregon State University
Corvallis, OR 97331-6001
Phone: 541-737-3441
Email: info-mime@oregonstate.edu
Website: http://mime.oregonstate.edu/

**Faculty**

**Professors** Batten, Campbell, Cann, Dahmen, Kruzic, Liburdy, Logendran, Narayanan, Paasch, B. Paul, Pence, Sharp, Stone, I. Tumer, K. Tumer

**Associate Professors** Albertani, Apte, Atre, Bay, Funk, Gibbons, Grimm, Hurst, Porter, Smart, Warnes

**Assistant Professors** Balasubramanian, Blunck, Calvo, DuPont, Eseonu, Feuerbach, Fronk, Greaney, Haapala, Hagen, Hatton, Hollinger, Hoyle, Malhotra, Menguc, Ng, Niemeyer, Parmigiani, Sencer, Tucker, Vergara, Wang

**Instructors** Ettringer, Feldman, Natarajan, Shea, Squires

**Professional Faculty**

Barber, Borntrager, DeAdder, Finn, Helvie, Jensen, Marx, G. Newcomb, L. Paul, Randall, J. Robinson, T.A. Robinson

**Aeronautical & Astronautical Engineering**

**AAE 210. INTRODUCTION TO AEROSPACE ENGINEERING. (3 Credits)**
Topics will include the engineering fundamentals of aeronautics and astronautics, including an introduction to aerodynamics, propulsion, structures, orbital mechanics, and mission planning. Current industry practices in aerospace vehicle specifications, manufacturing, flight testing and certification will be presented.

**Prerequisites:** ENGR 211 with C or better

**AAE 412. SPACE SYSTEMS ENGINEERING. (4 Credits)**
Introduction to space systems engineering. Topics will include the fundamentals of astronautics, orbital mechanics and trajectory design, flight dynamics, guidance and navigation, stability and control of spacecraft. Rocket propulsion concepts, including chemical rockets (liquid, gas and solid propellants), hybrid rocket engines and modern advances in satellite power systems will be discussed. Current design practices in space systems engineering will be emphasized.

**Prerequisites:** (ME 317 with C or better or ME 317H with C or better) and (ME 373 [C] or ME 373H [C])

**AAE 512. SPACE SYSTEMS ENGINEERING. (4 Credits)**
Introduction to space systems engineering. Topics will include the fundamentals of astronautics, orbital mechanics and trajectory design, flight dynamics, guidance and navigation, stability and control of spacecraft. Rocket propulsion concepts, including chemical rockets (liquid, gas and solid propellants), hybrid rocket engines and modern advances in satellite power systems will be discussed. Current design practices in space systems engineering will be emphasized.

**Recommended:** (ME 373 or ME 373H) and (ME 317 or ME 317H)

**Energy Systems Engineering**

**ESE 330. MODELING AND ANALYSIS OF DYNAMIC SYSTEMS. (4 Credits)**
Presents basic concepts of dynamic behavior, and the analytical and computational techniques for predicting and assessing dynamic behavior. Modeling a basic system, compound system, dynamic stability, and natural behavior to continuing and abrupt inputs are presented.

**Prerequisites:** ENGR 202 with C or better and ENGR 212 [C] and MTH 256 [C] and MTH 306 [C]

**ESE 355. ENERGY REGULATION. (4 Credits)**
Introductory course to the policies and laws governing energy generation and transmission in the United States with a focus on electricity. History of regulations give context to understand current regulation and potential future policies. Laws regulating the use of alternative energy resources covered in a practical setting. Offered at OSU-Cascades only.

**Prerequisites:** BA 360 (may be taken concurrently) with C or better or ENGR 390 (may be taken concurrently) with C or better

**ESE 360. ENERGY CONSUMPTION ANALYSIS. (4 Credits)**
Analysis of energy use in transportation, residential and industrial sectors to understand how new technologies improve energy efficiency. Tradeoff techniques applied to decide between less efficient, less expensive systems versus more efficient, more expensive systems. International energy consumption compared, and energy losses evaluated for heating, cooling and electronic systems. Offered at OSU-Cascades only.

**Prerequisites:** (BA 360 (may be taken concurrently) with C or better or ENGR 390 (may be taken concurrently) with C or better) and ME 311 [C]

**ESE 430. FEEDBACK CONTROL SYSTEMS. (4 Credits)**
Modeling and analysis of linear, continuous-time systems in the time and frequency domains. Fundamentals of single-input-single-output control system design using both time-domain and frequency-domain techniques.

**Prerequisites:** ESE 330 with C or better

**ESE 450. ENERGY GENERATION SYSTEMS. (4 Credits)**
Survey of technical fundamentals and operational principles of conventional and renewable energy conversion systems to understand the environmental and sustainable issues for energy systems currently in use or may be used in the future to power our industrial society. Offered at OSU-Cascades only.

**Prerequisites:** ME 312 with C or better
### ESE 470. ENERGY DISTRIBUTION SYSTEMS. (4 Credits)
Detailed coverage of the electrical energy distribution system, its operation, control and design. Design considerations and impacts to meet emerging and evolving customer needs. Broader understanding of natural gas and oil pipeline distribution for these infrastructure commodities. Offered at OSU-Cascades only.
**Prerequisites:** ENGR 202 with C or better and ME 311 [C]

### ESE 471. ENERGY STORAGE SYSTEMS. (4 Credits)
Coverage of energy storage technologies involving electrochemical, mechanical and emerging options. Integration of the energy storage media, its effects on the bulk power system, and design tradeoffs to understand environmental impacts, cost, reliabilities, and efficiencies for commercialization of bulk energy storage. Offered at OSU-Cascades only.
**Prerequisites:** ENGR 202 with C or better and ME 312 [C]

### ESE 497. *MIME CAPSTONE DESIGN. (4 Credits)
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC
**Prerequisites:** (ENGR 390 with C or better or BA 360 with C or better) and IE 425 [C] and (ME 312 [C] or ME 312H [C] and (ME 331 [C] or ME 331H [C]) and ESE 355 [C] and ESE 360 [C] and WR 327 [C] and (ST 314 [C] or ST 314H [C]) and)
**Equivalent to:** IE 497, ME 497, MIME 497

### ESE 498. *MIME CAPSTONE DESIGN. (4 Credits)
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC
**Prerequisites:** ESE 497 with C or better or IE 497 with C or better or ME 497 with C or better or MIME 497 with C or better
**Equivalent to:** IE 498, ME 498

### ESE 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

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### Industrial and Manufacturing Engineering

#### IE 112. SPREADSHEET SKILLS FOR INDUSTRIAL & MANUFACTURING ENGINEERS. (1 Credit)
Basic spreadsheet functionality needed to create spreadsheet applications for common industrial and manufacturing engineering information processing tasks, including simple databases, statistical analysis, quality control, forecasting, production planning and control, and operations analysis and improvement. Topics include creating spreadsheets, formatting, data types, formulas, charts, user-defined functions, and pivot tables.

**IE 199. SPECIAL TOPICS. (1-16 Credits)
Special topics in industrial engineering.
This course is repeatable for 16 credits.

**IE 212. COMPUTATIONAL METHODS FOR INDUSTRIAL ENGINEERING. (4 Credits)
**Prerequisites:** ENGR 112 with C or better and IE 112 (may be taken concurrently) [C]
**Recommended:** Algebra, calculus, differentiation and integration

**IE 255. INTRODUCTORY QUANTITATIVE ANALYSIS OF INDUSTRIAL AND MANUFACTURING SYSTEMS. (3 Credits)
An introduction to basic analysis concepts that will be utilized in subsequent industrial and manufacturing engineering courses. Emphasis will be placed on fundamental concepts such as data collection, commonly applied quantitative analysis methods, and how these are utilized to support decisions in different industrial and manufacturing system applications. Examples include resource utilization calculations, equipment fraction equations, queuing models, basic statistical inference procedures, and probability models used in discrete event simulation.
**Prerequisites:** MTH 252 with C or better

**IE 285. INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING. (3 Credits)
Introduction to selected topics in industrial and manufacturing engineering, including history and philosophy, product design and manufacturing cycle, integrate role of engineering and business, and multi-objective nature of organizations. Surveys of selected design problems in resource allocation, operations and quality management, and production engineering. CROSSLISTED as IE 285/MFGE 285.
**Prerequisites:** IE 112 (may be taken concurrently) with C or better or FOR 112 (may be taken concurrently) with C or better
**Equivalent to:** MFGE 285

**IE 299. SPECIAL TOPICS. (1-16 Credits)
Special topics in industrial engineering.
This course is repeatable for 16 credits.

**IE 355. STATISTICAL QUALITY CONTROL. (4 Credits)
Control of quality through the use of statistical analysis; typical control techniques and underlying theory. Development of reliability models and procedures for product assurance. Lec/lab.
**Prerequisites:** IE 255 with C or better or ST 314 with C or better
**Equivalent to:** IE 351

**IE 356. EXPERIMENTAL DESIGN FOR INDUSTRIAL PROCESSES. (4 Credits)
Systematic analysis of processes through the use of statistical analysis, methods, and procedures. Application of statistical techniques including use of classic process analysis techniques, regression and design of experiments. Lec/rec.
**Prerequisites:** IE 255 with C or better or ST 314 with C or better
**Equivalent to:** IE 352

**IE 366. WORK SYSTEMS ENGINEERING. (4 Credits)
Principles and techniques of work measurement, methods engineering, workplace design, work sampling, and predetermined time systems. Basic human factors engineering and ergonomics principles applied to workplace design. The work systems engineering process. Lec/lab/rec.
**Prerequisites:** (IE 255 with C or better or ST 314 with C or better) and PH 212 [C] and PH 213 [C]
**Equivalent to:** IE 341

**IE 367. PRODUCTION PLANNING AND CONTROL. (4 Credits)
Forecasting techniques, inventory analysis, master production scheduling, material and capacity requirements, planning and scheduling methods.
**Prerequisites:** IE 256 with C or better or ST 314 with C or better
**Equivalent to:** IE 362
IE 368. FACILITY DESIGN AND OPERATIONS MANAGEMENT. (4 Credits)
Design and analysis of industrial facilities including just-in-time systems, queuing, material handling systems, material flow analysis, line balancing, systematic layout planning, design of warehouse facilities, and facilities location.
Prerequisites: ENGR 248 with C or better and (IE 255 [C] or ST 314 [C])
Equivalent to: IE 365

IE 380. THE RESPONSIBLE ENGINEER. (3 Credits)
The idea of responsibility and the ethical responsibilities of the engineer. Introduction to value, ethics, and ethical systems. Engineering as value creation and the ethical ramifications of engineering. Codes of engineering ethics. Recognizing and addressing ethical dilemmas in engineering. Examination of the individual, social, and environmental effects of engineering and technology. (Baccalaureate Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

IE 399. SPECIAL TOPICS. (1-16 Credits)
Special topics in industrial engineering.
This course is repeatable for 16 credits.

IE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

IE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

IE 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

IE 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

IE 411. VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS. (4 Credits)
Object-oriented modeling, Unified Modeling Language, software development concepts, file and database connectivity, and visual programming skills (Microsoft Visual Basic) for use in developing industrial applications, such as process monitoring and supply chain management.
Prerequisites: IE 212 with C or better
Equivalent to: IE 414

IE 426. STOCHASTIC MODELS OF INDUSTRIAL SYSTEMS. (4 Credits)
The application of probabilistic and stochastic modeling methodologies to analyze the performance of production and service systems. Major topics include probability models for space planning, Poisson arrival processes, discrete and continuous time Markov chain models of machine cycle times, and queueing models applied to various industrial systems. Other applications of these tools to model inventories, process behavior, and equipment reliability is illustrated.
Prerequisites: (IE 255 with C or better or ST 314 with C or better) and (MTH 306 [C] or MTH 341 [C])
Equivalent to: IE 421, IE 422

IE 425. INDUSTRIAL SYSTEMS OPTIMIZATION. (4 Credits)
A first course in operations research. Topics include mathematical programming formulations and solutions, the simplex method, network optimization, introduction to metaheuristics, and linear programming under uncertainty.
Prerequisites: (IE 255 with C or better or ST 314 with C or better) and (MTH 306 [C] or MTH 341 [C])
Equivalent to: IE 421, IE 422

IE 447. PROJECT MANAGEMENT IN ENGINEERING. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Time, cost, and performance parameters are analyzed from the organizational, people, and resource perspectives. Network optimization and simulation concepts are introduced. Resource-constrained project scheduling case discussions and a term project are included.
Prerequisites: ENGR 390 with C or better and IE 355 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C]
Equivalent to: IE 474

IE 470. MANAGEMENT SYSTEMS ENGINEERING. (4 Credits)
Improvement of organizational performance through the design and implementation of systems that integrate personnel, technological, environmental, and organizational variables. Topics include performance assessment and measurement as well as improvement methodologies.
Prerequisites: ENGR 390 with C or better and IE 355 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C]
Equivalent to: IE 421, IE 422

IE 475. ADVANCED MANUFACTURING COSTING TECHNIQUES. (3 Credits)
Costing techniques applicable in advanced manufacturing enterprises: activity-based costing, economic value added, Japanese cost management techniques, life cycle costing, throughput accounting, cost of quality, and financial versus operational performance measures. Emphasis on linkages to such advanced manufacturing systems as cellular manufacturing, flexible manufacturing, JIT, Lean, and ERP.
Prerequisites: ENGR 390 with C or better and IE 355 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C]
Equivalent to: IE 495
IE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

IE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IE 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

IE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

IE 511. VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS. (4 Credits)
Object-oriented modeling, Unified Modeling Language, software development concepts, file and database connectivity, and visual programming skills (Microsoft Visual Basic) for use in developing industrial applications, such as process monitoring and supply chain management.
Equivalent to: IE 514
Recommended: IE 212

IE 512. INFORMATION SYSTEMS ENGINEERING. (4 Credits)
Framework for enterprise information systems. Engineering and scientific systems. Requirements definition, enhanced entity relationship modeling, logical modeling, structured query language, relational model, referential integrity. Lec/lab.

IE 515. SIMULATION AND DECISION SUPPORT SYSTEMS. (4 Credits)
Analysis of operations and production systems through the application of computer simulation modeling techniques. Fundamentals of computer simulation including random number generation, input/output data analysis, model validation and verification. Lec/lab.
Recommended: ST 314

IE 518. TELECOMMUNICATION CONCEPTS. (3 Credits)
Telecommunication concepts for industrial applications. OSI reference model, local area networks, wide area networks, internet architecture. Taught fall in even years.
Recommended: IE 212 and previous programming experience.

IE 519. WIRELESS NETWORKS. (3 Credits)
RF fundamentals, ISO 802.11 standards, spread spectrum technology, narrow band technology, direct sequence and frequency hopping transmission schemes, electromagnetic interference, design of indoor wireless networks.
Prerequisites: IE 518 with C or better

IE 521. INDUSTRIAL SYSTEMS OPTIMIZATION I. (3 Credits)
Techniques for analysis and solution of problems in industrial and management systems. Emphasis on application of linear and integer programming and extensions.
Equivalent to: IE 525
Recommended: MTH 341

IE 522. INDUSTRIAL SYSTEMS OPTIMIZATION II. (3 Credits)
Techniques for analysis and solution of problems in industrial and management systems. Emphasis on applications of dynamic programming, Markovian processes, and questions as applied to industrial problems.
Recommended: ST 314

IE 523. INTEGER PROGRAMMING. (3 Credits)
Classic models and algorithms for discrete optimization. Includes intuition and theory about computational strategies for solution of integer programming and combinatorial optimization problems.
Prerequisites: IE 521 with C or better

IE 533. HUMAN ANALYTICS AND BEHAVIORAL OPERATIONS. (3 Credits)
Introduces several quantitative applications related to determining workforce size, skill-sets, and multi-functionality in service and manufacturing systems based on measurable quality and productivity performance, at the intersection of human factors engineering and production planning. Modeling and solving problems in a context of the speed and accuracy trade-off. Models include learning, forgetting, teamwork, fatigue, procrastination, and individual difference measures.
Recommended: Introductory math programming

IE 542. DESIGN OF HUMAN FACTORS / ERGONOMICS EXPERIMENTS. (4 Credits)
Designed to provide graduate students with introductions to a broad range of methods appropriate for studying humans, tasks, environments and their interaction along with various topics in the area of Human Factors/Ergonomics. Reading/discussion format.
Recommended: Graduate level statistics course

IE 546. HUMAN-MACHINE SYSTEMS ENGINEERING. (3 Credits)
Development of safe, high performance human-machine systems. System/function/task analysis, function allocation, design, mockups and rapid prototyping, human factors test and evaluation. Critical examination of the human-factors and domain-specific literature to identify human factors problems, and knowledge and methods to address those problems.
Equivalent to: IE 542
Recommended: IE 545

IE 548. COGNITIVE ENGINEERING. (3 Credits)
Theories and models of human sensory, cognitive, and motor performance pertaining to the operation of complex systems. Applications to human-machine systems engineering. Research topics and methods related to cognitive engineering.
Recommended: IE 545

IE 552. DESIGN OF INDUSTRIAL EXPERIMENTS. (3 Credits)
A first course in design of experiments with an emphasis on applications and fundamental data analysis methods. Basic statistical inference, analysis of variance, blocking, general factorial designs, and two-level factorial designs are covered.
Recommended: ST 314
IE 553. DESIGN OF INDUSTRIAL EXPERIMENTS II. (3 Credits)  
This second course in design of experiments is a continuation of IE 552. The same textbook is used. Topics covered include two-level fractional factorial designs, regression models, response surface methods, rules for expected sum of squares and expected mean squares, a summary of the 'no-name' approach to DOE, and analysis of experiments with unbalanced data (time permitting).  
Prerequisites: IE 552 with C or better

IE 563. ADVANCED PRODUCTION PLANNING AND CONTROL. (3 Credits)  
Recommended: IE 521 and ST 314

IE 564. DESIGN AND SCHEDULING OF CELLULAR MANUFACTURING SYSTEMS. (3 Credits)  
Recommended: Computer experience

IE 570. MANAGEMENT SYSTEMS ENGINEERING. (4 Credits)  
Improvement of organizational performance through the design and implementation of systems that integrate personnel, technological, environmental, and organizational variables. Topics include performance assessment and measurement as well as improvement methodologies.  
Equivalent to: IE 574

IE 571. PROJECT MANAGEMENT IN ENGINEERING. (3 Credits)  
Critical issues in the management of engineering and high-technology projects are discussed. Time, cost, and performance parameters are analyzed from the organizational, people, and resource perspectives. Network optimization and simulation concepts are introduced. Resource-constrained project scheduling case discussions and a term project are included.

IE 575. SYSTEMS THINKING THEORY AND PRACTICE. (4 Credits)  
An introduction to systems science theory and practice. Systems science theory is explored through the fundamentals of systems thinking theory, and theory of knowledge. Systems science practice is explored through system dynamics modeling techniques for simulating socio-technical systems, structures, and processes.

IE 581. OPERATIONS MANAGEMENT. (4 Credits)  
Critical and current issues on the implementation of operations management strategies for the engineering manager. Includes aspects of operations in an engineering management environment such as work systems design, forecasting, strategy, facilities location and design, management of quality and resources planning and management.  
Prerequisites: IE 582 with B or better  
Recommended: IE 571

IE 582. INTRODUCTION TO MANAGEMENT FOR ENGINEERS AND SCIENTISTS. (4 Credits)  
An introduction to concepts, tools, and practices necessary for a broad understanding of the roles of engineering and technical managers. A mix of research results, case studies, and experiential learning is used to bolster theories of management, with focus on technical organizations.

IE 583. ADVANCED ENGINEERING ECONOMICS ANALYSIS. (4 Credits)  
Examines the economics dimension of engineering management, from costing techniques to financial analysis. Topics include industrial cost analysis and estimation, economic planning, forecasting, and budgeting, and financial analysis for engineering and engineering management.  
Prerequisites: IE 582 with B or better  
Recommended: Basic courses in engineering economic analysis (ENGR 390)

IE 584. SYSTEMS ENGINEERING. (4 Credits)  
An overview of systems engineering within engineering management practice. Principles of systems engineering are explored through traditional and contemporary hard and soft systems of engineering techniques and practices, and through current future developments in the field.  
Prerequisites: IE 582 with B- or better  
Recommended: IE 581 and IE 583 and IE 586 and IE 587

IE 585. LEGAL ASPECT OF ENGINEERING MANAGEMENT. (3 Credits)  
A survey of legal topics relevant to engineers, including basic of legal system, labor law, intellectual property, torts, and contracts. This is an introductory course, emphasizes on legal principles that can provide engineers with the ability to recognize legal issues that are likely to arise in the engineering profession and engineering management. Note: This is an introductory class and will in no way make a student a lawyer. Students are advised to seek legal representation if he/she encounters a legal issue.  
Prerequisites: IE 582 with B or better  
Recommended: IE 581 and IE 583 and IE 586 and IE 587

IE 586. PROJECT RISK MANAGEMENT. (4 Credits)  
An introduction to the concept of project risk in producing constructed engineering projects. Course content includes project baselining, risk definition and identification, risk assessment and management techniques, risk control, risk response, and risk management.  
CROSSLISTED as CCE 552/IE 586.  
Equivalent to: CCE 552

IE 587. MANAGEMENT OF INFORMATION SYSTEMS. (4 Credits)  
An introduction to the management of information systems and their strategic importance in business. Topics covered include global e-business and collaboration, databases and information management, basics of telecommunications and wireless technology, security vulnerabilities of information systems, basics of business intelligence and business analytics, knowledge management and enhanced decision making.  
Prerequisites: IE 582 with B or better

IE 588. MANAGEMENT OF NEW PRODUCT DEVELOPMENT. (4 Credits)  
Introduces the new product development (NPD) process with the objective of understanding the underlying structure in NPD and exploring the methods to manage NPD processes by applying them to case studies and term project. The NPD process is investigated through its five key phases: (1) Opportunity identification/selection, (2) Concept generation, (3) Concept/project evaluation, (4) Development, and (5) Launch.  
Prerequisites: IE 581 with B or better and IE 582 [B] and IE 583 [B]  
Recommended: IE 584
IE 589. PROFESSIONAL RESPONSIBILITY AND ETHICS. (3 Credits)
An in-depth exploration of professional engineering ethics. Course content includes conceptual theoretical basis of ethics, ethics among professional organizations, ethical consideration of design, critical analysis of ethical situations, ethics in the workplace, and ethical considerations regarding the broader environment. CROSSLISTED as CCE 554/IE 589.
Equivalent to: CCE 554

IE 590. STRATEGIC PLANNING IN ENGINEERING ORGANIZATIONS. (4 Credits)
Provides an overview of the strategic planning process from a variety of engineering perspectives. Variety engineering is explored via key management control theory concepts and through applying students' work experience.
Prerequisites: IE 581 with B or better and IE 582 (B) and IE 583 (B)

IE 591. STATISTICAL CONCEPTS FOR ENGINEERING MANAGERS. (4 Credits)
Provides a first review of basic probability and statistical inference concepts and methods relevant for engineering managers. This is followed by a presentation of frequently utilized statistical methods in industry. These include process control, regression analysis, and experimental design. For each method, the fundamental ideas will be covered, and simple examples will be presented to provide engineering managers with the background needed to initiate and manage applications of these methods in industry. The course will end with an overview of process optimization, and robust parameter design.
Prerequisites: IE 582 with B or better

IE 594. RESEARCH METHODS IN ENGINEERING. (3 Credits)
Introduction to research methodologies including surveys, interviews, quasi-experimentation, and case studies. Methods for research design, and collection and analysis of data.
Equivalent to: IE 574

IE 599. SPECIAL TOPICS. (1-5 Credits)
Recent advances in industrial engineering pertaining to the theory and application of system studies. Analysis and design of natural resource systems; evaluation; detection extraction; processing and marketing of condensed phases, solution thermodynamics, liquid-solid and solid-solid phase equilibria; and (ENGR 321 [C] or ENGR 321H [C] or MATS 321 [C])

IE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

IE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

IE 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

Materials Science
MATS 221. THE SCIENCE, ENGINEERING AND SOCIAL IMPACT OF NANOTECHNOLOGY. (3 Credits)
Nanotechnology is an emerging engineering field that manipulates atoms and molecules to fabricate new materials and tiny devices. Properties of nanostructured materials, manufacturing methods, characterization methods, and impact on health and safety. Benefits and concerns about nanotechnology will be assessed. Lec/rec. CROSSLISTED as ENG 221/MATS 221.
Equivalent to: ENGR 221
Recommended: One year of college science.

MATS 321. INTRODUCTION TO MATERIALS SCIENCE. (4 Credits)
Crystal structure, microstructure, and physical properties of metals, ceramics, polymers, composites, and amorphous materials. Also includes elementary mechanical behavior and phase equilibria.
Prerequisites: CH 202 with C or better or CH 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 224H with C or better
Equivalent to: ENGR 321, ENGR 321H, MATS 321H

MATS 321H. INTRODUCTION TO MATERIALS SCIENCE. (4 Credits)
Crystal structure, microstructure, and physical properties of metals, ceramics, polymers, composites, and amorphous materials. Also includes elementary mechanical behavior and phase equilibria.
Attributes: HNRS – Honors Course Designator
Prerequisites: CH 202 with C or better or CH 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 224H with C or better
Equivalent to: ENGR 321, ENGR 321H, MATS 321

MATS 322. MECHANICAL PROPERTIES OF MATERIALS. (3 Credits)
Mechanical behavior of materials, relating laboratory test results to material structure, and elements of mechanical analysis.
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (ENGR 321 [C] or ENGR 321H [C] or MATS 321 [C])
Equivalent to: ENGR 322

MATS 413. THERMODYNAMICS AND PHASE EQUILIBRIA OF MATERIALS. (4 Credits)
Explores the statistical interpretation of entropy, heat capacity, enthalpy of condensed phases, solution thermodynamics, liquid-solid and solid-solid phase equilibria. Considers the principles of thermodynamics governing phase stability with a focus on liquid-solid and solid-solid equilibria, and phase stability in two-component systems. Examines the relationship of Gibbs free energy to phase stability.
Prerequisites: MATS 321 with C or better and (ME 311 [C] or NSE 311 [C] or CHE 311 [C])

MATS 441. PHYSICAL METALLURGY. (3 Credits)
Introduction to properties of metals and alloys including solidification, diffusion, solid solutions, intermediate phases, annealing, heat treatment and phase transformation with a focus on ferrous and non-ferrous metal systems. Identifies relationships between material composition, structure, and properties resulting from synthesis, processing or service. Explores the knowledge of ferrous and non-ferrous alloy systems and their significant metallurgical properties and applications.
Prerequisites: MATS 321 with C or better
MATS 445. WELDING METALLURGY. (4 Credits)  
Theory-based course focused on the metallurgy of welds. Topics covered include welding/joining processes, heat input, diffusion, solidification, phase transformation, materials compatibility and welding defects. This is NOT a practical welding class.  
**Prerequisites:** (MATS 321 with C or better or ENGR 321 with C or better or ENGR 321H with C or better) or MATS 570 with C or better

**MATS 455. EXPERIMENTAL TECHNIQUES IN MATERIAL SCIENCE. (4 Credits)**  
Materials processing, characterization, computational and data analysis techniques in materials science. Focus on processing-structure-property relationships. Lec/lab.  
**Prerequisites:** (ENGR 321 with C or better or ENGR 321H with C or better)  
**Equivalent to:** ME 455  
_This course is repeatable for 8 credits._  
**Recommended:** ME 570

**MATS 478. THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES. (4 Credits)**  
Processing of thin films and characterization of the microstructure; diffusion and solid state reactions; mechanical, magnetic and electronic properties of thin films.  
**Prerequisites:** (ME 311 with C or better or ME 311H with C or better) and (ENGR 321 [C] or ENGR 321H [C] or MATS 321 [C]) and (ENGR 322 [C] or MATS 322 [C])  
**Equivalent to:** ME 478

**MATS 499. SPECIAL TOPICS. (1-16 Credits)**  
_This course is repeatable for 16 credits._

**MATS 545. WELDING METALLURGY. (4 Credits)**  
Theory-based course focused on the metallurgy of welds. Topics covered include welding/joining processes, heat input, diffusion, solidification, phase transformation, materials compatibility and welding defects. This is NOT a practical welding class.  
**Recommended:** (MATS 321 or ENGR 321 or ENGR 321H) or MATS 570

**MATS 555. EXPERIMENTAL TECHNIQUES IN MATERIAL SCIENCE. (4 Credits)**  
Materials processing, characterization, computational and data analysis techniques in materials science. Focus on processing-structure-property relationships. Lec/lab.  
**Prerequisites:** ME 570 with C or better  
**Equivalent to:** ME 555  
_This course is repeatable for 8 credits._  
**Recommended:** ENGR 321 or ENGR 321H

**MATS 570. STRUCTURE-PROPERTY RELATIONS IN MATERIALS. (4 Credits)**  
**Equivalent to:** ME 570

**MATS 571. ELECTRONIC PROPERTIES OF MATERIALS. (4 Credits)**  
**Equivalent to:** ME 571  
**Recommended:** CH 545 or ME 570

**MATS 578. THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES. (4 Credits)**  
Processing of thin films and characterization of the microstructure; diffusion and solid state reactions; mechanical, magnetic and electronic properties of thin films.  
**Equivalent to:** ME 578

**MATS 581. THERMODYNAMICS OF SOLIDS. (4 Credits)**  
**Equivalent to:** ME 581

**MATS 582. RATE PROCESSES IN MATERIALS. (3 Credits)**  
Diffusion in solids, including vacancy and interstitial and short-circuit diffusion. Phase transformations including classic nucleation and growth theory. Applications to materials development.  
**Equivalent to:** ME 582

**MATS 584. ADVANCED FRACTURE OF MATERIALS. (4 Credits)**  
Fracture mechanics will be used as a basis for predicting failure of materials, understanding failure mechanisms, and identifying causes of failure. Course will include discussion of recent journal articles, experimental demonstrations, and analysis of real fracture data.  
**Equivalent to:** ME 584  
**Recommended:** ENGR 322

**MATS 587. DISLOCATIONS, DEFORMATION, AND CREEP. (4 Credits)**  
The effects of point, line, and planar defects on plastic deformation and creep behavior in solids will be discussed with emphasis on the role of dislocations and vacancies.  
**Equivalent to:** ME 587  
**Recommended:** ENGR 322

**MATS 588. COMPUTATIONAL METHODS IN MATERIALS SCIENCE. (4 Credits)**  
A broad introduction to important materials science simulation methods. These include molecular dynamics, density functional theory, and Monte Carlo methods. Learning is through a mixture of lecture and hands-on lab projects in which students use computational methods to explore and reinforce fundamental concepts in materials science. Lec/lab.  
**Equivalent to:** ME 588  
**Recommended:** Experience with Matlab or Mathematica or an equivalent numerical and programming environment.

**MATS 599. SPECIAL TOPICS. (1-16 Credits)**  
_This course is repeatable for 16 credits._

**MATS 659. PRINCIPLES OF TRANSMISSION ELECTRON MICROSCOPY. (4 Credits)**  
This lecture-only course covers basic principles of transmission electron microscopy (TEM) including instrument components, electron optics, electron diffraction, and the origins and interpretation of image contrast. Spectroscopic techniques are covered, but diffraction and imaging techniques are emphasized. Coverage of experimental techniques will focus on those useful for addressing problems in materials science.  
**Recommended:** MATS 570 and (CH 616 or MATS 555)

**MATS 671. ELECTRONIC PROPERTIES OF OXIDES. (4 Credits)**  
Band theory of solids applied to metal oxide materials. Includes metallic oxides, non-stoichiometric semiconductors and associated defect chemistry, high temperature superconductors, electrostatics, linear dielectrics, non-linear dielectrics, piezoelectrics, and the optical properties of oxides.  
**Equivalent to:** ME 671  
**Recommended:** ME 571 or MATS 571 or PH 575
Mechanical Engineering

ME 250. INTRODUCTION TO MANUFACTURING PROCESSES. (1 Credit)
Use of measuring and layout tools, interpretation of blueprints and drawings, identification of engineering materials. Operation of machine tools, including calculation of machining parameters. Operation of gas and MIG welding equipment. Lec/lab. Graded P/N.
Prerequisites: ENGR 248 with C or better and (PH 211 [C] or PH 211H [C])

ME 299. SPECIAL TOPICS. (1-16 Credits)
Graded P/N.
Equivalent to: ME 299H
This course is repeatable for 16 credits.

ME 299H. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: ME 299
This course is repeatable for 16 credits.

ME 306. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ME 311. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, momentum and the second law of thermodynamics are included. CROSSLISTED as ME 311/NSE 311.
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ENGR 311, ENGR 311H, ME 311H, NE 311, NE 311H, NSE 311, NSE 311H

ME 311H. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, momentum and the second law of thermodynamics are included. CROSSLISTED as ME 311/NSE 311.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ENGR 311, ENGR 311H, ME 311, NE 311, NE 311H, NSE 311, NSE 311H

ME 312. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ENGR 312, ME 312H, NE 312, NE 312H, NSE 312, NSE 312H

ME 312H. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 312, NE 312, NE 312H, NSE 312, NSE 312H

ME 316. MECHANICS OF MATERIALS. (3 Credits)
Determination of stresses, deflections, and stability of deformable bodies with an introduction to finite element analysis.
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (MTH 256 [C] or MTH 256H [C])

ME 317. INTERMEDIATE DYNAMICS. (4 Credits)
Continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers.
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 317H

ME 317H. INTERMEDIATE DYNAMICS. (4 Credits)
Continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C]))
Equivalent to: ME 317

ME 331. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Prerequisites: ((MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C]) and (ENGR 311 [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ENGR 331, ENGR 331H, ME 331, NE 331, NE 331H

ME 331H. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C]) and (ENGR 311 [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 331, ENGR 331, ENGR 331H, ME 331, ME 331H, NSE 331, NSE 331H

ME 332. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Prerequisites: ((MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (ME 311 [C] or ME 311H [C] or NE 311 [C] or NE 311H [C]) and (ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C]))
Equivalent to: ME 332H, NE 332, NE 332H, NSE 332, NSE 332H
ME 332H. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSTLISTED as ME 332/NSE 332.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (ME 311 [C] or ME 311H [C] or NE 311 [C] or NE 311H [C] and (ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C]))
Equivalent to: ENGR 332, ME 332, NE 332H, NSE 332, NSE 332H

ME 348. ADVANCED SOLID MODELING. (1 Credit)
Prerequisites: ENGR 248 with C or better

ME 373. MECHANICAL ENGINEERING METHODS. (3 Credits)
Prerequisites: ENGR 248 with C or better and ME 250 (may be taken concurrently) [C] and ENGR 212 [C] and ENGR 213 [C]
Equivalent to: ME 373H

ME 373H. MECHANICAL ENGINEERING METHODS. (3 Credits)
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (MTH 256 [C] or MTH 256H [C]) and MTH 341 [C]
Equivalent to: ME 373H

ME 382. INTRODUCTION TO DESIGN. (4 Credits)
Prerequisites: ENGR 248 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 213 [C])
Equivalent to: ME 382H

ME 382H. INTRODUCTION TO DESIGN. (4 Credits)
Prerequisites: (ME 316 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 213 [C])
Equivalent to: ME 382H

ME 383. MECHANICAL COMPONENT DESIGN. (4 Credits)
Prerequisites: ME 316 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 213 [C])
Equivalent to: ME 383H

ME 383H. MECHANICAL COMPONENT DESIGN. (4 Credits)
Prerequisites: ME 316 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 213 [C])
Equivalent to: ME 383H

ME 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: ME 405H
This course is repeatable for 9 credits.

ME 405H. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: ME 405
This course is repeatable for 9 credits.

ME 406. PROJECTS. (1-16 Credits)
This course is repeatable for 15 credits.

ME 407. SEMINAR. (1-16 Credits)
Equivalent to: ME 407H
This course is repeatable for 2 credits.

ME 410. INTERNSHIP. (1-16 Credits)
Credits may not apply toward BS degree in Mechanical Engineering. Graded P/N.
This course is repeatable for 16 credits.

ME 411. AEROSPACE APPLICATIONS IN MECHANICAL ENGINEERING. (4 Credits)
Prerequisites: (ME 316 with C or better and (ME 317 [C] or ME 317H [C]) and (ME 331 [C] or ME 331H [C] and (ME 373 [C] or ME 373H [C]))

ME 412. DESIGN OF MECHANISMS. (4 Credits)
Prerequisites: (ME 316 with C or better and (ME 317 [C] or ME 317H [C]) and (ME 331 [C] or ME 331H [C] and (ME 373 [C] or ME 373H [C]))

ME 413. COMPUTER-AIDED DESIGN AND MANUFACTURING. (4 Credits)
Prerequisites: (ME 316 with C or better and (ME 317 [C] or ME 317H [C]) and (ME 331 [C] or ME 331H [C] and (ME 373 [C] or ME 373H [C]))

ME 420. APPLIED STRESS ANALYSIS. (4 Credits)
Prerequisites: ME 316 with C or better

ME 422. MECHANICAL VIBRATIONS. (4 Credits)
Prerequisites: ME 317 with C or better or ME 317H with C or better

ME 425. COMPUTER-AIDED MECHANICAL DESIGN. (4 Credits)
Prerequisites: ME 317 with C or better or ME 317H with C or better

ME 430. THESIS. (1-16 Credits)
Equivalent to: ME 422H
This course is repeatable for 16 credits.
ME 422H. MECHANICAL VIBRATIONS. (4 Credits)
Dynamic response of single and multiple degree-of-freedom systems.
Attributes: HNRS – Honors Course Designator
Prerequisites: ME 317 with C or better or ME 317H with C or better
Equivalent to: ME 422

ME 424. FINITE ELEMENT MODELING OF MECHANICAL ENGINEERING SYSTEMS. (3 Credits)
Application of modern finite element code in the analysis of complex mechanical engineering systems. Extensive use of engineering workstations. Lec/lab.
Prerequisites: ME 420 with C or better or ME 520 with C or better

ME 430. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSTLISTED as ECE 451/ME 430.
Prerequisites: (ME 317 with C or better or ME 317H with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C])) )
Equivalent to: ECE 451, ME 430H

ME 430H. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSTLISTED as ECE 451/ME 430.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 317 with C or better or ME 317H with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C])) )
Equivalent to: ECE 451, ME 430

ME 443. RENEWABLE ENERGY: THERMAL FLUID SYSTEMS. (4 Credits)
Evaluates several thermal/fluid power conversion strategies that deal with both thermal and fluid energy sources in terms of basic conversion technology, resource potential and developmental challenges. There are four modules, each targeting a particular renewable energy system in thermal and fluid sciences.
Prerequisites: (ME 311 with C or better or ME 311H with C or better or NE 311 with C or better or NE 311H with C or better) and (ME 331 [C] or ME 331H [C] or NE 331 [C] or NE 331H [C]) and (ME 332 [C] or ME 332H [C] or NE 332 [C] or NE 332H [C])

ME 444. THERMAL SYSTEMS DESIGN AND ANALYSIS. (4 Credits)
Integration of the concepts, laws, and methodologies from fluid mechanics, heat transfer, and thermodynamics, into a set of practical tools for thermal energy systems design and analysis.
Prerequisites: (ME 332 with C or better or ME 332H with C or better or NSE 332 with C or better or NSE 332H with C or better) and (ME 312 (may be taken concurrently) [C] or ME 312H (may be taken concurrently) [C] or NSE 312 (may be taken concurrently) [C] or NSE 312H (may be taken concurrently) [C])

ME 445. INTRODUCTION TO COMBUSTION. (4 Credits)
Study of combustion science based on the background of chemistry, thermodynamics, fluid mechanics, heat and mass transfer. Stoichiometry, energetics of chemical reactions, flame temperature, equilibrium product analyses, chemical kinetics, and chain reactions.
Prerequisites: (ME 312 with C or better or ME 312H with C or better) and (ME 332 [C] or ME 332H [C])

ME 450. APPLIED HEAT TRANSFER. (4 Credits)
An intermediate heat transfer course seeking to lay a foundation for determining the heating and cooling characteristics with a variety of modern and classical processes. Included is design of multi-component heat transfer systems. Lecture, 110 minutes twice per week.
Prerequisites: ME 332 with C or better or ME 332H with C or better

ME 451. INTRODUCTION TO INSTRUMENTATION AND MEASUREMENT SYSTEMS. (4 Credits)
Function, operation, and application of common mechanical engineering instruments, measurement principles, and statistical analysis. Major elements of measurement systems, including transduction, signal conditioning, and data recording. Function and operation of digital data acquisition systems. Lec/lab.
Prerequisites: (ENGR 202 with C or better or ENGR 202H with C or better) and (ME 311 [C] or ME 311H [C]) and ME 316 [C] and (ME 317 [C] or ME 317H [C]) and (ME 373 [C] or ME 373H [C]) and (ST 314 [C] or ST 314H [C])
Equivalent to: ME 351

ME 452. THERMAL AND FLUIDS SCIENCES LABORATORY. (4 Credits)
Course emphasis is on experiments related to thermodynamics, heat transfer, and fluid mechanics. Proper experimental methods, data and uncertainty analysis related to thermal and fluids measurements are discussed.
Prerequisites: (ME 311 with C or better or ME 311H with C or better) and (ME 331 [C] or ME 331H [C] and (ME 332 [C] or ME 332H [C])
Equivalent to: ME 452H

ME 452H. THERMAL AND FLUIDS SCIENCES LABORATORY. (4 Credits)
Course emphasis is on experiments related to thermodynamics, heat transfer, and fluid mechanics. Proper experimental methods, data and uncertainty analysis related to thermal and fluids measurements are discussed.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 311 with C or better or ME 311H with C or better) and (ME 331 [C] or ME 331H [C] and (ME 332 [C] or ME 332H [C])
Equivalent to: ME 452

ME 453. STRUCTURE AND MECHANICS LABORATORY . (4 Credits)
Function, operation, and application of common mechanical engineering instruments, measurement principles, and statistical analysis. Major elements of measurement systems, including transduction, signal conditioning, and data recording. Function and operation of digital data acquisition systems. Lec/lab.
Prerequisites: (ENGR 202 with C or better or ENGR 202H with C or better) and (ME 311 [C] or ME 311H [C]) and ME 316 [C] and (ME 317 [C] or ME 317H [C]) and (ME 373 [C] or ME 373H [C]) and (ST 314 [C] or ST 314H [C])
Equivalent to: ME 351

ME 460. INTERMEDIATE FLUID MECHANICS. (4 Credits)
Ideal fluid flow including potential flow theory. Introduction to compressible flow. Viscous flow and boundary layer theory. Introduction to turbulence.
Prerequisites: ME 331 with C or better or ME 331H with C or better

ME 461. GAS DYNAMICS. (4 Credits)
Studies one-dimensional isentropic flow, nozzles, diffusers, normal and oblique shocks, compressible flow with friction and heating, and an introduction to propulsion systems.
Prerequisites: (ME 312 with C or better or ME 312H with C or better) and (ME 331 [C] or ME 331H [C])

ME 480. MATERIALS SELECTION. (3 Credits)
Selecting materials for engineering applications. The major families of materials, their properties, and how their properties are controlled; case studies and design projects emphasizing materials selection.
Prerequisites: MATS 322 with C or better or ENGR 322 with C or better
ME 484. FRACTURE OF MATERIALS. (3 Credits)
Fracture mechanics and fatigue mechanisms: mechanisms of ductile and brittle fracture. Environmentally induced fracture and fatigue. Considerations in design of engineering materials and structures will be discussed.
Prerequisites: MATS 322 with C or better or ENGR 322 with C or better

ME 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: ME 499H
This course is repeatable for 16 credits.

ME 499H. SPECIAL TOPICS. (0-16 Credits)
Recommended:

ME 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ME 502. INDEPENDENT STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

ME 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ME 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ME 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ME 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ME 508. THERMAL FLUID SCIENCE SEMINAR. (1 Credit)
Student participation seminar experience for 1 course credit. Students will present and listen to seminars concerning ongoing research within the thermal fluid sciences.

ME 509. MATERIALS SCIENCE SEMINAR. (1 Credit)
Student participation seminar experience for one credit; students will listen to seminars concerning ongoing research activities within materials science. Students will also have the opportunity to present their own research results periodically. Graded P/N.
Equivalent to: MATS 509

ME 511. PRECISION MACHINE DESIGN. (3 Credits)
Tolerance analysis and application in design/manufacturing practice, principles of machine design and computational analysis of errors in machine design, sensor mounting and sensor calibration, machine level error budget with geometric and thermal errors, structural design of joints and supports, deterministic damping, exact constraint design for flexures and couplings, bearing systems design, motion and power system design for machine tools. CROSSLISTED as ME 511/MFGE 511.
Equivalent to: MFGE 511
Recommended: An understanding of mechanical component design and solid mechanics.

ME 512. DESIGN OF MECHANISMS. (4 Credits)
Analysis and study of the function, classification, position, velocity, and acceleration of multi-element mechanical linkages and mechanisms. Synthesis of mechanisms for specified multiple point paths, quick return, dwell, and straight-line motion. The lecture will instruct students in the kinematic analysis and synthesis of mechanisms through the use of theory and software packages. The laboratory will familiarize students with a modern mechanism design and animation software package. Lec/lab.
Recommended: (ME 317 or ME 317H) and ME 383

ME 513. BIO-INSPIRED DESIGN. (4 Credits)
Intersection of design and biology that seeks to systematically mine biological knowledge to solve design problems. Investigates inspiration from nature from three different types: visual, conceptual, and computational. Includes design rules, heuristics, principles or patterns to solve engineering problems. Algorithmic bio-inspiration emulates natural algorithms for control or optimization problems.

ME 515. RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN. (4 Credits)
Fundamentals of risk, uncertainty, and reliability. Methods to analyze and quantify the risk of failures, and the reliability of complex systems, including fault tree analysis, reliability block diagrams, probabilistic risk assessment. Introduction to research methods for risk and reliability analysis during the early design stages.

ME 516. MODELING AND ANALYSIS OF COMPLEX SYSTEMS. (4 Credits)
Introduction to challenges and considerations when designing complex systems. Fundamentals of systems engineering and methods used in practice. Models and tools used to enable the use of models for trade studies during the design of complex systems. Model-based design environments and methodologies. Introduction to decision support tools in design.

ME 517. OPTIMIZATION IN DESIGN. (4 Credits)
Optimization methods as applied to engineering design, theory and application of nonlinear optimization techniques for multivariate unconstrained and constrained problems. Model boundedness and sensitivity.

ME 519. SELECTED TOPICS IN DESIGN. (3-4 Credits)
Topics in mechanical design selected from the following: design processes, quality engineering, design for assembly, statistical machine design, the Taguchi method, and parametric design.
This course is repeatable for 32 credits.

ME 520. APPLIED STRESS ANALYSIS. (4 Credits)
Elasticity theory, failure theories, energy methods, finite element analysis. Recommended: ME 316

ME 521. LINEAR ELASTICITY. (4 Credits)
A general introduction to the theory of elasticity. The solution of 2-D problems using the Airy stress function in rectangular and polar coordinates. The solution of 3-D problems using the Galerkin vector, the Papkovich-Neuber solution, and complex variable methods. Applications to asymptotic fields at discontinuities, contact and crack problems, and thermoelasticity. Recommended: ME 316

ME 522. MECHANICAL VIBRATIONS. (4 Credits)
Dynamic response of single and multiple degree-of-freedom systems. Recommended: ME 317

ME 523. ADVANCED STRESS ANALYSIS. (4 Credits)
An introduction to the mechanics of nonlinear elastic, plastic, and viscoelastic material behavior including large deformations. Recommended: ME 316

ME 524. FINITE ELEMENT MODELING OF MECHANICAL ENGINEERING SYSTEMS. (3 Credits)
Application of modern finite element code in the analysis of complex mechanical engineering systems. Extensive use of engineering workstations. Lec/lab.
Prerequisites: ME 520 with C or better
ME 526. NUMERICAL METHODS FOR ENGINEERING ANALYSIS. (3 Credits)
Equivalent to: NE 526, NSE 526 
Recommended: Programming experience and previous exposure to numerical methods 

ME 529. SELECTED TOPICS IN SOLID MECHANICS. (3-4 Credits)
Advanced topics in solid mechanics emphasizing research applications of current interest. 
This course is repeatable for 32 credits. 

ME 531. LINEAR MULTIVARIABLE CONTROL SYSTEMS I. (4 Credits)
Theoretical design of control systems for systems modeled by linear multivariable differential equations. Topics covered include controllability, observability, state feedback control, pole placement, output feedback, estimator design, and control designs that include both estimators and regulators. 
Prerequisites: ME 531 with C or better 

ME 533. NONLINEAR DYNAMIC ANALYSIS. (4 Credits)
Course focuses on understanding the behavior of nonlinear dynamic systems of interest to mechanical engineers. Lec. 
Recommended: ME 317 

ME 534. NONLINEAR MULTIVARIABLE CONTROL SYSTEMS. (4 Credits)
Focuses on designing control systems when the device to be controlled is mathematically described by a nonlinear set of differential equations. Lec. 
Prerequisites: ME 533 with C or better 

ME 539. SELECTED TOPICS IN DYNAMICS. (1-16 Credits)
Advanced topics in dynamics emphasizing research applications of current interest. 
This course is repeatable for 30 credits. 

ME 540. INTERMEDIATE THERMODYNAMICS. (4 Credits)
Students are expected to master classical thermodynamics by way of solving extended problems using software tools. Statistical thermodynamics concepts are also introduced and exercised. 
Recommended: ME 312 

ME 541. LIQUID-VAPOR PHASE CHANGE AND HEAT TRANSFER. (4 Credits)
Advanced treatment of underlying physics and engineering modeling approaches for heat transfer associated with vapor/liquid phase change processes. Topics include thermodynamics and mechanical aspects of phase change processes, pool boiling, filmwise and dropwise condensation, internal convective boiling and condensation, and other emerging areas in phase change heat transfer. 

ME 543. RENEWABLE ENERGY: THERMAL FLUID SYSTEMS. (4 Credits)
Evaluates several thermal/fluid power conversion strategies that deal with both thermal and fluid energy sources in terms of basic conversion technology, resource potential and developmental challenges. There are four modules, each targeting a particular renewable energy system in thermal and fluid sciences. 
Recommended: (ME 311 or ME 311H or NE 311 or NE 311H) and (ME 331 or ME 331H or NE 331 or NE 331H) and (ME 332 or ME 332H or NE 332 or NE 332H) 

ME 544. ADVANCED POWER GENERATION SYSTEMS. (4 Credits)
Thermal mechanical evaluation of modern power generation technologies, including fossil and nuclear Rankine cycle power plants, gas turbines, cogeneration power plants, distributed power generation and fuel cells. Lec/rec. 
Recommended: ME 312 and (ME 332 or ME 332H) 

ME 545. INTRODUCTION TO COMBUSTION. (4 Credits)
Study of combustion science based on the background of chemistry, thermodynamics, fluid mechanics, heat and mass transfer. Stoichiometry, energetics of chemical reactions, flame temperature, equilibrium product analyses, chemical kinetics, and chain reactions. 
Recommended: ME 312 and (ME 332 or ME 332H) 

ME 546. CONVECTION HEAT TRANSFER. (3 Credits)
An advanced treatment of forced and natural convection heat transfer processes emphasizing underlying physical phenomena. Current topical literature will be considered; analytical and numerical problem solving is included. 
Recommended: (ME 332 or ME 332H) and ME 373 

ME 547. CONDUCTIVE HEAT TRANSFER. (3 Credits)
Analytical and numerical solutions to steady state and transient conduction problems. 
Recommended: (ME 332 or ME 332H) and ME 373 

ME 548. RADIATION HEAT TRANSFER. (3 Credits)
Analytical and numerical methods of solution of thermal radiation problems. 
Recommended: (ME 332 or ME 332H) and ME 373 

ME 549. SELECTED TOPICS IN HEAT TRANSFER. (3 Credits)
Topics in heat transfer including advanced problems in conduction, radiation, and convection. Additional examination of heat transfer in multiphase systems, inverse problems, combined modes, equipment design, solution techniques and other topics of current interest considered, including extensive use of current literature. Not all topics covered each year. 
This course is repeatable for 9 credits. 

ME 550. APPLIED HEAT TRANSFER. (4 Credits)
An intermediate heat transfer course seeking to lay a foundation for determining the heating and cooling characteristics with a variety of modern and classical processes. Included is design of multi-component heat transfer systems. Lecture, 110 minutes twice per week. 
Recommended: ME 332 or ME 332H 

ME 552. MEASUREMENTS IN FLUID MECHANICS AND HEAT TRANSFER. (4 Credits)
Course emphasis is on measurement techniques and data analysis methods related to fluid mechanics and heat transfer. Proper experimental methods, data and uncertainty analyses related to thermal and fluids measurements are discussed. Local and spatial mapping of fluid and thermal fields are highlighted. 
Recommended: (ME 331 or ME 331H) and (ME 332 or ME 332H) and ME 451 

ME 553. STRUCTURE AND MECHANICS LABORATORY. (4 Credits)
Techniques for measurement of structural response and material properties. Proper use of rosette strain gauges, load cells, and displacement transducers. Full-field strain measurement using photoelasticity and digital image correlation. Proper implementation of material testing standards. Characterization of anisotropic composite materials. 
Recommended: ME 451
**ME 560. INTERMEDIATE FLUID MECHANICS.** (4 Credits)
Ideal fluid flow including potential flow theory. Introduction to compressible flow. Viscous flow and boundary layer theory. Introduction to turbulence.
Recommended: ME 331

**ME 561. GAS DYNAMICS.** (4 Credits)
Studies one-dimensional isentropic flow, nozzles, diffusers, normal and oblique shocks, compressible flow with friction and heating, and an introduction to propulsion systems.
Recommended: ME 312 and (ME 331 or ME 331H)

**ME 564. TURBULENCE MODELING.** (3 Credits)
An introductory course on theory of different turbulence modeling techniques such as Reynolds Averaged Navier Stokes (RANS), Large Eddy Simulation (LES), and Direct Numerical Simulation (DNS) applied to a range of turbulent flows including free shear flows, boundary layers, and internal flows.
Prerequisites: ME 560 with C or better and (ME 565 [C] or ME 566 [C])

**ME 565. INCOMPRESSIBLE FLUID MECHANICS.** (3 Credits)
Generalized fluid mechanics; kinematics; methods of description, geometry of the vector field, dynamics of nonviscous fluids, potential motion, two-dimensional potential flow with vorticity.

**ME 566. VISCOS FLOW.** (3 Credits)
Boundary layer, stability, transition prediction methods, computational methods in fluid mechanics, recent developments.

**ME 567. ENGINEERING APPLICATIONS OF COMPUTATIONAL FLUID DYNAMICS.** (4 Credits)
Basic concepts of computational fluid dynamics, a technique used for solving fully three-dimensional fluid flow problems with no exact solution, will be discussed and applied to general engineering applications using commercially available software. Lec.
Recommended: ME 312 and (ME 331 or ME 331H)

**ME 568. TURBULENT FLOW DYNAMICS.** (4 Credits)
An introductory course of the basic physics of turbulent flows, coverage will include statistical methods and physical interpretation of a range of flows including boundary layer flows, internal flows, and environmental flows.
Prerequisites: ME 560 with C or better
Recommended: A first course in fluid mechanics such as ME 331

**ME 569. SELECTED TOPICS IN FLUID MECHANICS.** (2-4 Credits)
Topics in fluid mechanics emphasizing research applications of current interest.
This course is repeatable for 32 credits.

**ME 580. MATERIALS SELECTION.** (3 Credits)
Selecting materials for engineering applications. The major families of materials, their properties, and how their properties are controlled; case studies and design projects emphasizing materials selection. Lec/lab.
Equivalent to: MATS 580
Recommended: MATS 322 or ENGR 322

**ME 583. COMPOSITE MATERIALS.** (3 Credits)
Fibers and matrices, mechanics of composites, reinforcement and failure mechanisms, properties and applications. Lec/lab.
Recommended: MATS 322 or ENGR 322

**ME 585. FATIGUE OF MATERIALS.** (4 Credits)
Analyses the failure of materials by fatigue including how fatigue behavior is characterized, how fatigue failure is predicted, the physical mechanisms responsible for fatigue failure of various materials, and how such behavior is related to the atomic structure and microstructure of the material.
Prerequisites: ME 570 with C or better or MATS 570 with C or better

**ME 589. SELECTED TOPICS IN MATERIALS.** (3 Credits)
Topics in materials science to correspond to areas of graduate research. Topics will likely be considered, including extensive use of literature. Not all topics covered each year.
This course is repeatable for 32 credits.

**ME 597. PRECISION MOTION GENERATION.** (4 Credits)
Introduces fundamental knowledge in mechatronic systems used in manufacturing equipment such as CNC machine tools, and their computer numerical controls. Students will be exposed to sensors and actuators utilized in machine tools, industrial robots and for process automation. Fundamental knowledge to model and identify dynamics of motion delivery systems, design and analysis of accurate position control algorithms for precision motion generation will be covered. Digital motion control design will be introduced. Motion planning and real-time path interpolation algorithms will be covered. Students will be able to design NC systems for 2D motion platforms.
Recommended: ME 430

**ME 599. SPECIAL TOPICS.** (0-16 Credits)
This course is repeatable for 32 credits.

**ME 601. RESEARCH.** (1-16 Credits)
This course is repeatable for 16 credits.

**ME 603. THESIS.** (1-16 Credits)
This course is repeatable for 999 credits.

**ME 605. READING AND CONFERENCE.** (1-16 Credits)
This course is repeatable for 16 credits.

**ME 606. PROJECTS.** (1-16 Credits)
This course is repeatable for 16 credits.

**ME 607. SEMINAR.** (1-16 Credits)
This course is repeatable for 16 credits.

**ME 611. MODERN PRODUCT DESIGN.** (4 Credits)
Modern product development, design and prototyping are covered. Product development and prototyping is examined from a research standpoint in this course. Customer outcomes gathering, functional modeling, product architecture, modern techniques for concept generation and selection are explored. Also covered are recently developed theories and techniques for prototyping. The topics’ place in the overall design process is shown through a product development and prototyping project.
ME 613. SUSTAINABLE PRODUCT DESIGN. (4 Credits)
Graduate students will work in multidisciplinary design teams to develop innovative and environmentally friendly products. Combining the principles of integrated product development and sustainable design thinking, students will (a) advance their knowledge of the design process by creating a patent-quality new product, (b) learn and employ environmentally-minded design theory and methods, including various software packages and online tools, and (c) further enhance teamwork skills by working collaboratively in a professional design team. Sustainable Product Development is conducted as a collaborative design experience, in that lectures, discussion, and team working time will be integrated into class sessions.

ME 615. DESIGN UNDER UNCERTAINTY. (4 Credits)
Tackles the problem of decision making in engineering design. The fundamental challenge faced in making decisions in engineering designs is that they are almost exclusively decisions made under uncertainty. Sources of uncertainty could result from engineering models, experiments conducted, or lack of knowledge of future events. The course will cover three basic topics 1) how do we quantify uncertainty, 2) how do we account for the uncertainty in decision making, and 3) how do we make design selection decisions about products or systems we design.

Prerequisites: ME 517 with C or better

ME 617. DESIGN AUTOMATION. (4 Credits)
Design automation is the field of study whereby advanced numerical methods are used to automate difficult or tedious design decisions. Typically, such methods are based on numerical optimization and artificial intelligence. They work in tandem with other engineering digital tools like computer-aided design, computer-aided manufacturing, and finite-element analysis. This course builds upon a fundamental understanding of optimization to introduce students to a range of different techniques that may be used to support engineering decision-making. This includes heuristic methods, AI tree-search, discrete and stochastic algorithms. The course concludes with discussion of recent innovations in multi-objective, multi-disciplinary and robust optimization.

Prerequisites: ME 517 with C or better

ME 667. COMPUTATIONAL FLUID DYNAMICS. (3 Credits)
Application of modern computational techniques to solve a wide variety of fluid dynamics problems including both potential and viscous flow with requirements for computer code development.

Prerequisites: (ME 560 with C or better or ME 565 with C or better or ME 566 with C or better) and (ME 526 [C] or ME 575 [C])

Manufacturing Engineering

MFGE 285. INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING. (3 Credits)
Introduction to selected topics in industrial and manufacturing engineering, including history and philosophy, product design and manufacturing cycle, integrate role of engineering and business, and multi-objective nature of organizations. Surveys of selected design problems in resource allocation, operations and quality management, and production engineering. CROSSLISTED as IE 285/MFGE 285.

Prerequisites: IE 112 (may be taken concurrently) with C or better or FOR 112 (may be taken concurrently) with C or better

Equivalent to: IE 285

MFGE 336. PRODUCTION ENGINEERING. (4 Credits)
Provides a general understanding of the production engineering function within industry and the means by which to achieve tight tolerances through machining. Geometric dimensioning and tolerancing, fixture and gage design, and fundamentals of metal cutting mechanics are introduced, and their interactions are explored. Lec/lab.

Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and ENGR 248 [C] and (ENGR 321 [C] or ENGR 321H [C] or MATS 321 [C] or MATS 321H [C]) and ME 250 [C] and ME 517 [C]

Equivalent to: IE 336

MFGE 337. MATERIALS AND MANUFACTURING PROCESSES. (4 Credits)
Introduces mechanical manufacturing methods by which materials are economically shaped into valuable products. The overall goal is to develop an understanding of how the functionality, shape, materials, cost and sustainability of a product influence manufacturing process selection and design.

Prerequisites: (ME 317 with C or better or ME 317H with C or better or MATS 321 with C or better or MATS 321H with C or better) and ME 250 [C] and MFGE 336 [C]

Equivalent to: IE 337

MFGE 436. LEAN MANUFACTURING SYSTEMS ENGINEERING. (4 Credits)
The planning, evaluation, deployment, and integration of lean manufacturing theory and methods. Examines manufacturing processes/equipment and systems, e.g., planning/control, product design, supply chain resource management. Lec/lab.

Prerequisites: ENGR 390 with C or better or ENGR 391 with C or better

Equivalent to: IE 436

MFGE 437. COMPUTER CONTROL OF MANUFACTURING PROCESSES. (4 Credits)
Introduces fundamental knowledge in the automation of manufacturing systems and processes. Automated manufacturing system design and operations—computer numerical control (CNC) technology, NC part programming, sensors and actuators, their modeling and dynamic simulation, feedback motion delivery systems design and tuning; programmable logic controls (PLC) for industrial control systems, and path planning for numerical controlled (NC) machinery. Lec/lab.

Prerequisites: (ME 317 with C or better or ME 317H with C or better or MFGE 336 with C or better) and (ENGR 212 [C] or ENGR 212H [C])

Equivalent to: IE 437

MFGE 438. COMPOSITES MANUFACTURING. (4 Credits)
Introduction to fiber-reinforced composite materials and their applications. Topics include matrices and reinforcement; open and closed molding processes; filament winding, quality, testing, damage assessment; basics of factory operations and sustainability of composites. Students will complete laboratory projects using fiber-reinforced laminates. Lec/lab.

Prerequisites: ENGR 213 with C or better or ENGR 213H with C or better

MFGE 499. SPECIAL TOPICS. (0-5 Credits)
This course is repeatable for 99 credits.

MFGE 507. SEMINAR. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.

MFGE 507. SEMINAR. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.

MFGE 507. SEMINAR. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.

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Graded P/N.

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Graded P/N.

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Graded P/N.

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MFGE 507. SEMINAR. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.

MFGE 507. SEMINAR. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.

MFGE 507. SEMINAR. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.
MFGE 511. PRECISION MACHINE DESIGN. (3 Credits)
Tolerance analysis and application in design/manufacturing practice, principles of machine design and computational analysis of errors in machine design, sensor mounting and sensor calibration, machine level error budget with geometric and thermal errors, structural design of joints and supports, deterministic damping, exact constraint design for flexures and couplings, bearing systems design, motion and power system design for machine tools. CROSSLISTED as ME 511/MFGE 511.
Equivalent to: ME 511
Recommended: An understanding of mechanical component design and solid mechanics.

MFGE 531. MICROMANUFACTURING. (4 Credits)
Introduction to microsystem platforms, scaling laws and size effects in micromanufacturing techniques with an emphasis on microchannel arrays, microchannel lamination and micro-scale characterization. Lec/lab.
Equivalent to: IE 531

MFGE 535. INDUSTRIAL SUSTAINABILITY ANALYSIS. (3 Credits)
Students are exposed to the role of business and engineering in the design and implementation of sustainable industrial systems. Drivers, metrics, and analysis concepts, methods, and tools are introduced. Students incorporate business and engineering considerations in making product, manufacturing process, and supply chain design considerations.

MFGE 536. LEAN MANUFACTURING SYSTEMS ENGINEERING. (4 Credits)
The planning, evaluation, deployment, and integration of lean manufacturing theory and methods. Examines manufacturing processes/equipment and systems, e.g., planning/control, product design, supply chain management. Lec/lab.
Equivalent to: IE 536

MFGE 538. COMPOSITES MANUFACTURING. (4 Credits)
Introduction to fiber-reinforced composite materials and their applications. Topics include matrices and reinforcement; open and closed molding processes; filament winding, quality, testing, damage assessment; basics of factory operability and sustainability of composites. Students will complete laboratory projects using fiber-reinforced laminates. Lec/lab.
Recommended: (ENGR 213 or ENGR 213H)

MFGE 551. ADDITIVE MANUFACTURING. (3 Credits)
Introduces basic principles and process physics for additive manufacturing as compared with subtractive manufacturing. Various processes in AM (extrusion, jetting, photopolymerization, powder bed fusion, direct energy deposition and sheet lamination) and laser AM are discussed. Materials selection in AM (metals, polymers, ceramics and composites), powder metallurgy and metallurgical phenomena in additive manufacturing will be covered.

MFGE 599. SPECIAL TOPICS. (0-5 Credits)
This course is repeatable for 99 credits.

MIME 101. INTRODUCTION TO MIME. (3 Credits)
Provides students with an overview of mechanical, industrial, manufacturing, and energy systems engineering careers and an introduction to technical areas of study. Skills necessary for success in both the academic curriculum and in the engineering profession will also be emphasized, including communication and ethics. Lec/rec.
Equivalent to: ME 101, MIME 101H

MIME 101H. INTRODUCTION TO MIME. (3 Credits)
Provides students with an overview of mechanical, industrial, manufacturing, and energy systems engineering careers and an introduction to technical areas of study. Skills necessary for success in both the academic curriculum and in the engineering profession will also be emphasized, including communication and ethics. Lec/rec.
Attributes: HNRS – Honors Course Designator
Equivalent to: MIME 101

MIME 199. SPECIAL TOPICS. (0-4 Credits)
Equivalent to: MIME 101

MIME 299. SPECIAL TOPICS. (0-4 Credits)
This course is repeatable for 4 credits.

MIME 399. SPECIAL TOPICS. (0-4 Credits)
Special topics in mechanical, industrial, and manufacturing engineering. This course is repeatable for 16 credits.

MIME 497. *MIME CAPSTONE DESIGN. (4 Credits)
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (IE 355 with C or better and IE 356 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C] and WR 327 [C]) or (MATS 322 [C] and (ENGR 391 [C] or ENGR 391H [C]) and ME 250 [C] and (ME 312 [C] or ME 312H [C]) and (ME 317 [C] or ME 317H [C]) and (ME 383 [C] or ME 383H [C]) and WR 327 [C] and (ST 314 [C] or ST 314H [C]))
Equivalent to: ESE 497, IE 497, ME 497

MIME 498. *MIME CAPSTONE DESIGN. (4 Credits)
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MIME 497 with C or better or ESE 497 with C or better
Equivalent to: ESE 498, IE 498, ME 498

MIME 504. WRITING AND CONFERENCE/EXPLORATION. (1-9 Credits)
Students will be allowed to register for a variable number of MIME 504 credits to bring their registration up to full-time status (9 credits). Graded P/N.
Equivalent to: IE 504, ME 504, ROB 504
This course is repeatable for 15 credits.

MIME 507. SEMINAR/NEW STUDENT ORIENTATION. (1 Credit)

Robotics

ROB 421. APPLIED ROBOTICS. (4 Credits)
Multidisciplinary teams of students design, build, and demonstrate a robotic system, including all sensing, computation, and actuation. The specific task, such as checkers-playing robots, changes each year, and is designed to be challenging for ambitious students. Robots will compete in a friendly competition at the end of the term. Lec/lab.
Prerequisites: ME 430 with C or better
Equivalent to: ENGR 421
ROB 456. INTELLIGENT ROBOTS. (4 Credits)
Foundations of probabilistic reasoning for robotics. Topics include state estimation, robot motion, perception, localization and decision making under uncertainty.
Prerequisites: ST 314 with C or better
Equivalent to: ME 456
Recommended: CS 331, CS 361, ECE 353, or other programming experience

ROB 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

ROB 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ROB 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ROB 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ROB 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ROB 514. INTRODUCTION TO ROBOTICS. (4 Credits)
A broad introduction to the field of robotics, and to the graduate Robotics program. The goal of the class is to take students with different backgrounds (mechanical engineering, computer science, electrical engineering, physics, etc.) and give them a common base in the fundamentals of robotics. A secondary goal is to introduce students to the Robotics program, and to give them some of the skills that will make them successful, both in the program and as a professional roboticist.

ROB 521. RESEARCH ROBOTICS. (4 Credits)
Multidisciplinary teams of students will use the backdrop of a robotics competition to generate a research question, then design, build, and demonstrate a robotic system that is used to answer this research question. An example may be a Jenga-playing robot, where students try a new computer vision algorithm, or test a theory on force control. This directly parallels graduate research in robotics, where systems-building is necessary, and toy problems can illustrate research results, but the important focus is a core research question. The specific competition task changes each year, and robots will compete at the end of the term. Lec/lab.
Equivalent to: ENGR 521

ROB 534. SEQUENTIAL DECISION MAKING IN ROBOTICS. (4 Credits)
Examines sequential decision making in robotics with a focus on motion planning and related optimization problems applied to fielded systems in marine, aerial, and ground domains. Discussions regarding both fundamental background material as well as cutting edge research in the following areas: discrete planning, sampling-based planning, planning under uncertainty, multi-robot systems, optimization, and performance guarantees.

ROB 537. LEARNING-BASED CONTROL. (4 Credits)
Provides an introduction to learning systems and their application to the control of nonlinear systems. Covered topics include neural networks, reinforcement learning, and evolutionary algorithms. Includes project component in which students write a technical paper and give a conference style presentation based on their project.
Equivalent to: ME 537

ROB 538. AUTONOMOUS AGENTS AND MULTI-AGENT SYSTEMS. (4 Credits)
Provides an introduction to autonomous agents and multi-agent systems. In particular, it focuses on how to use agents as building blocks for different autonomous systems. Covered topics include reinforcement learning, game theory, swarms, auctions, and collectives. Because this course covers a constantly evolving field, there will be a significant paper reading component in addition to the regular lectures. Students are expected to spend at least three hours a week reading, discussing and critiquing assigned papers.
Equivalent to: ME 538

ROB 541. GEOMETRIC MECHANICS. (4 Credits)
An introduction to geometric methods in the analysis of dynamic systems. Using the kinematics of simple robotic systems as a motivating example, we explore topics such as manifolds and Lie groups, representations of velocity, holonomic and nonholonomic constraints, constraint curvature and response to cyclic inputs, distance metrics.
Recommended: Prior exposure to linear algebra and differential equations

ROB 542. ACTUATOR DYNAMICS. (4 Credits)
Focuses on how inertia, spring compliance, and other passive dynamics affect highly dynamic, software-controlled systems. Examples include robotic manipulation tasks, robot-human interaction, CNC machines, or legged locomotion. Lec/lab.
Recommended: Prior courses on dynamics and control such as ME 531, ME 533, ME 535

ROB 545. ROBOTIC MANIPULATION. (4 Credits)
Introduction to the mechanical processes governing manipulation with a focus on the kinematics, statics, and dynamics of interacting rigid bodies. Topics include numerical inverse kinematics, dynamics of open chains, and interaction control. Some manipulation problems considered include grasping, picking and placing, and assembly.

ROB 552. HUMAN ROBOT INTERACTION. (4 Credits)
Examines sequential decision making in robotics with a focus on motion planning and related optimization problems applied to fielded systems in marine, aerial, and ground domains. Discussions regarding both fundamental background material as well as cutting edge research in the following areas: discrete planning, sampling-based planning, planning under uncertainty, multi-robot systems, optimization, and performance guarantees.

ROB 554. SOFT ROBOTICS. (4 Credits)
Soft robotics researchers propose building intelligent machines purely out of stretchable compressible soft materials. The course is centered on term-long projects that will result in real soft robots with the goal of presenting to the international community. The topics covered include rapid digital manufacturing, soft actuators, soft sensors, soft logic, soft energy, applications of soft robotics, and modeling soft mechanics.

ROB 557. HUMAN ROBOT INTERACTION. (4 Credits)
The field of human-robot interaction brings together research and application of methodology from robotics, human factors, human-computer interaction, interaction design, cognitive psychology, education and other fields to enable robots to have more natural and more rewarding interactions with humans throughout their spheres of functioning.
Recommended: Background in one of human factors, usability/hci, programming experience, design
ROB 568. SOCIAL ROBOTICS. (4 Credits)
In-depth exploration of the leading research, design principles, and challenges in Human-Robot Interaction (HRI), with an emphasis on socially interactive robots. Topics include social embodiment, multi-modal communication, human-robot teamwork, social learning, aspects of social psychology and cognition, as well as applications and evaluation with human subjects. Requires participation, lightning talks, student-led lectures, written critiques of class readings, and a group project involving a hypothetical social robotics project.

ROB 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 32 credits.

ROB 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

ROB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ROB 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

Aerospace Engineering Minor

Minor Code: 905

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
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</tr>
<tr>
<td>AAE 210</td>
<td>INTRODUCTION TO AEROSPACE ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>ME 411</td>
<td>AEROSPACE APPLICATIONS IN MECHANICAL ENGINEERING</td>
<td>4</td>
</tr>
<tr>
<td>ME 497</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>ME 498</td>
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<tr>
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<tr>
<td>ME 445</td>
<td>INTRODUCTION TO COMBUSTION</td>
<td></td>
</tr>
<tr>
<td>ME 461</td>
<td>GAS DYNAMICS</td>
<td></td>
</tr>
<tr>
<td>ME 499</td>
<td>SPECIAL TOPICS (Space Systems Engineering)</td>
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<tr>
<td>ME 499</td>
<td>SPECIAL TOPICS (UAV Engineering)</td>
<td></td>
</tr>
<tr>
<td>ME 499</td>
<td>SPECIAL TOPICS (Aerospace Vehicle Design Laboratory)</td>
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</tbody>
</table>

Total Hours 27

Minor Code: 905

Energy Systems Engineering Undergraduate Major (BS, HBS)

Available only at OSU-Cascades.

At Oregon State University, the Energy Systems Engineering degree program combines engineering fundamentals with energy-focused technical courses and business management classes. This multidisciplinary curriculum provides students with a strong foundation in the core principles of mechanical, electrical and industrial engineering.

Program Educational Objectives—Energy Systems Engineering

Note: The Bachelor of Science and Honors Bachelor of Science degrees in Energy Systems Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org, which requires stated program educational objectives and student outcomes to support these.

OSU Energy Systems Engineering graduates receive an innovative education, and within 3 to 5 years of graduation will have:

1. Created value to organizations through the analysis, evaluation, and improvement of engineered systems and processes using appropriate systems engineering methods and tools.
2. Communicated effectively across disciplines and cultures to manage and/or lead activities in support of organizational goals and objectives.
3. Innovated systems and processes, in response to organizational challenges, through the application of structured and unstructured systems engineering methodologies, including engineering design and problem-solving.

Student Outcomes for the Energy Systems Engineering Program

The OSU Mechanical Engineering program prepares its graduates to achieve the Program Educational Objectives above several years into their careers. This is achieved by having students able to perform the following upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Major Code: 293

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baccalaureate Core</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>WR 227</td>
<td>*TECHNICAL WRITING</td>
<td>3</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>Skills</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH (or any PAC course)</td>
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<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
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<tr>
<td>Perspectives</td>
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<tr>
<td>HHS 281</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
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<tr>
<td>Western Culture</td>
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<td>3</td>
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<td>Cultural Diversity</td>
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<tr>
<td>Literature and the Arts</td>
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<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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<tr>
<td>Difference, Power and Discrimination</td>
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<td>3</td>
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<tr>
<td>Synthesis</td>
<td></td>
<td></td>
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<tr>
<td>SUS 350</td>
<td>*SUSTAINABLE COMMUNITIES</td>
<td>4</td>
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<tr>
<td>Science, Technology, and Society</td>
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<td>3</td>
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<tr>
<td>Math and Science</td>
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<td>9-10</td>
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Select one of the following CH series
Engineering Management Graduate Certificate

Available only via Ecampus.

This program focuses on the application of engineering principles to the planning and operational management of industrial and manufacturing operations, and prepares individuals to plan and manage such operations. It includes instruction in accounting, engineering economy, financial management, industrial and human resources management, industrial psychology, management information systems, mathematical modeling and optimization, quality control, operations research, safety and health issues, and environmental program management.

Certificate Code: CG22

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>IE 571</td>
<td>PROJECT MANAGEMENT IN ENGINEERING</td>
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<tr>
<td>IE 581</td>
<td>OPERATIONS MANAGEMENT</td>
<td>4</td>
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<tr>
<td>IE 582</td>
<td>INTRODUCTION TO MANAGEMENT FOR ENGINEERS AND SCIENTISTS</td>
<td>4</td>
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<tr>
<td>IE 583</td>
<td>ADVANCED ENGINEERING ECONOMICS ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>IE 584</td>
<td>SYSTEMS ENGINEERING</td>
<td>3-4</td>
</tr>
<tr>
<td>IE 585</td>
<td>LEGAL ASPECT OF ENGINEERING MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>IE 586/CCE 552</td>
<td>PROJECT RISK MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>IE 587</td>
<td>MANAGEMENT OF INFORMATION SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>IE 588</td>
<td>MANAGEMENT OF NEW PRODUCT DEVELOPMENT</td>
<td>4</td>
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<tr>
<td>IE 589/CCE 554</td>
<td>PROFESSIONAL RESPONSIBILITY AND ETHICS</td>
<td>4</td>
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<tr>
<td>IE 590</td>
<td>STRATEGIC PLANNING IN ENGINEERING ORGANIZATIONS</td>
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Electives

Select one course from the following:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>IE 584</td>
<td>SYSTEMS ENGINEERING</td>
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<tr>
<td>IE 585</td>
<td>LEGAL ASPECT OF ENGINEERING MANAGEMENT</td>
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<tr>
<td>IE 586/CCE 552</td>
<td>PROJECT RISK MANAGEMENT</td>
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<tr>
<td>IE 587</td>
<td>MANAGEMENT OF INFORMATION SYSTEMS</td>
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<td>IE 588</td>
<td>MANAGEMENT OF NEW PRODUCT DEVELOPMENT</td>
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<tr>
<td>IE 589/CCE 554</td>
<td>PROFESSIONAL RESPONSIBILITY AND ETHICS</td>
<td>4</td>
</tr>
<tr>
<td>IE 590</td>
<td>STRATEGIC PLANNING IN ENGINEERING ORGANIZATIONS</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours: 18-19

Certificate Code: CG22

Industrial Engineering Graduate Major (MENG, MS, PhD)

Also available via Ecampus.

Industrial engineering is the application of science, mathematics, and engineering methods to complex system integration and operation. Because the systems with which they work are so large and complex, industrial engineers (IEs) must develop expertise in a wide variety of disciplines, the ability to work well with people, and a broad, systems perspective. All IE graduate students learn advanced methods of system integration and operation. As practitioners, MEng and MS graduates analyze and design facilities, material handling systems, manufacturing processes, information systems, and workstations. They also develop, apply, and oversee policies, procedures, and algorithms for production planning, inventory control, resource allocation and scheduling, quality assurance, and supply chain management. As researchers, MS and PhD graduates advance the field of industrial and manufacturing engineering by their work in industrial corporations and government agencies. As educators, PhD graduates teach and perform research in industrial and manufacturing engineering in universities around the world.

Major Code: 3190

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* Baccalaureate Core Course (BCC)
  ^ Writing Intensive Course (WIC)
  ^ Prerequisite for upper-division courses

Major Code: 293
**Advanced Manufacturing Graduate Option**

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 479)
- Mechanical Engineering - College of Engineering (p. 488)

The Advanced Manufacturing graduate option is offered under both the Industrial Engineering and Mechanical Engineering majors. Advanced Manufacturing (AM) focuses on the integration of nanomaterial synthesis and microfabrication techniques and conventional macroscale manufacturing technologies to produce nano- and microscale systems in an economically, environmentally, and socially sustainable manner.

**Option Code: 3191**

A minimum of 12 credits from the following set of specific courses will be required of students wishing to declare the IE Advanced Manufacturing (AM) graduate option.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>Select one materials science course:</td>
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<td>MATS 570</td>
<td>STRUCTURE-PROPERTY RELATIONS IN MATERIALS</td>
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<td></td>
<td>Select one or more manufacturing system course:</td>
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<tr>
<td>IE 552</td>
<td>DESIGN OF INDUSTRIAL EXPERIMENTS</td>
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<tr>
<td>MFGE 535</td>
<td>INDUSTRIAL SUSTAINABILITY ANALYSIS</td>
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<td>MFGE 536</td>
<td>LEAN MANUFACTURING SYSTEMS ENGINEERING</td>
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<td></td>
<td>Select one or more manufacturing processes course(s):</td>
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<tr>
<td>MFGE 531</td>
<td>MICROMANUFACTURING</td>
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<tr>
<td>MFGE 538</td>
<td>COMPOSITES MANUFACTURING</td>
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</tbody>
</table>

**Total Hours**

**Option Code: 3195**

**Human Systems Engineering Graduate Option**

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 479)

This graduate option within the Industrial Engineering major distinguishes an area of specialization, human systems engineering, within the broader discipline of industrial engineering. Human Systems Engineering (HSE) uses engineering methods and knowledge from the physical, biological, information, social, and management sciences to develop, implement, operate, evaluate, and improve human-machine, human-human, and human-organization systems. Topical areas include management systems engineering and human factors and ergonomics.

**Option Code: 3192**

The following set of specific courses will be required of students wishing to declare the IE Human Systems Engineering (HSE) graduate option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Select one of the following:</td>
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<tr>
<td>IE 545</td>
<td>HUMAN FACTORS ENGINEERING</td>
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<tr>
<td>or IE 570</td>
<td>MANAGEMENT SYSTEMS ENGINEERING</td>
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<tr>
<td>IE 546</td>
<td>HUMAN-MACHINE SYSTEMS ENGINEERING</td>
<td>3-4</td>
</tr>
<tr>
<td>or MFGE 536</td>
<td>LEAN MANUFACTURING SYSTEMS ENGINEERING</td>
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<tr>
<td>IE 548</td>
<td>COGNITIVE ENGINEERING</td>
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</tr>
<tr>
<td>or IE 571</td>
<td>PROJECT MANAGEMENT IN ENGINEERING</td>
<td></td>
</tr>
<tr>
<td>H 594</td>
<td>APPLIED ERGONOMICS</td>
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<tr>
<td>IE 515</td>
<td>SIMULATION AND DECISION SUPPORT SYSTEMS</td>
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<tr>
<td>ME 515</td>
<td>RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN</td>
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<td>MFGE 535</td>
<td>INDUSTRIAL SUSTAINABILITY ANALYSIS</td>
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<td>PSY 537</td>
<td>MOTIVATION</td>
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<td>PSY 540</td>
<td>COGNITION RESEARCH</td>
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<tr>
<td>PSY 544</td>
<td>LEARNING AND MEMORY</td>
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<tr>
<td>PSY 596</td>
<td>INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY</td>
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<tr>
<td>SOC 518</td>
<td>QUALITATIVE RESEARCH METHODS</td>
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<td>ST 531</td>
<td>SAMPLING METHODS</td>
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<tr>
<td>ST 539</td>
<td>SURVEY METHODS</td>
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<tr>
<td>ST 559</td>
<td>BAYESIAN STATISTICS</td>
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</table>

**Total Hours**

**Option Code: 3196**

**Information Systems Engineering Graduate Option**

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 479)

This graduate option within the Industrial Engineering major distinguishes an area of specialization, information systems engineering, within the broader discipline of industrial engineering. Information Systems Engineering (ISE) uses information systems to integrate organizational mechanisms, people, and processes.
for purposes of improving organizational performance. Typical ISE technologies include database management systems, networks, wireless communications, Web-enabled technologies, and automatic identification and data collection using bar codes, RFID, EDI, and other such devices.

Option Code: 3193

The following set of specific courses will be required of students wishing to declare the IE Information Systems Engineering (ISE) graduate option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>IE 511</td>
<td>VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS</td>
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</tr>
<tr>
<td>IE 512</td>
<td>INFORMATION SYSTEMS ENGINEERING</td>
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<tr>
<td>IE 518</td>
<td>TELECOMMUNICATION CONCEPTS</td>
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<tr>
<td>IE 519</td>
<td>WIRELESS NETWORKS</td>
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Option Code: 3193

Manufacturing Systems Engineering Graduate Option

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 479)

This graduate option within the Industrial Engineering major distinguishes an area of specialization within the broader discipline of industrial engineering. Manufacturing Systems Engineering (MSE) focuses on the development of reliable, economically competitive, and environmentally benign manufacturing processes and systems. Topical areas include operations research, computer integrated manufacturing, environmentally responsible manufacturing, simulation, and statistical quality engineering.

Option Code: 3196

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
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<tr>
<td>IE 521</td>
<td>INDUSTRIAL SYSTEMS OPTIMIZATION I</td>
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<tr>
<td>or IE 522</td>
<td>INDUSTRIAL SYSTEMS OPTIMIZATION II</td>
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<tr>
<td>IE 563</td>
<td>ADVANCED PRODUCTION PLANNING AND CONTROL</td>
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<td>Select 6 or more credits of the following:</td>
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<tr>
<td>IE 512</td>
<td>INFORMATION SYSTEMS ENGINEERING</td>
<td></td>
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<tr>
<td>IE 515</td>
<td>SIMULATION AND DECISION SUPPORT SYSTEMS</td>
<td></td>
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<td>IE 545</td>
<td>HUMAN FACTORS ENGINEERING</td>
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<tr>
<td>IE 564</td>
<td>DESIGN AND SCHEDULING OF CELLULAR MANUFACTURING SYSTEMS</td>
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<tr>
<td>ME 515</td>
<td>RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN</td>
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<tr>
<td>ME 516</td>
<td>MODELING AND ANALYSIS OF COMPLEX SYSTEMS</td>
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<td>ME 517</td>
<td>OPTIMIZATION IN DESIGN</td>
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<tr>
<td>MFGE 536</td>
<td>LEAN MANUFACTURING SYSTEMS ENGINEERING</td>
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Option Code: 3196

Industrial Engineering Graduate Minor

Minor Code: 3190

Industrial Engineering Undergraduate Major (BS, HBS)

The Bachelor of Science and Honors Bachelor of Science degrees in Industrial Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

At Oregon State University, the industrial engineering focal areas include work design, production planning and control, statistical quality control, facilities design and operations management, simulation, and information systems, and materials and manufacturing processes.

Program Educational Objectives—Industrial Engineering

Note: The Bachelor of Science and Honors Bachelor of Science degrees in Industrial Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org, which requires stated program educational objectives and student outcomes to support these.

OSU Industrial Engineering graduates receive an innovative education, and within 3 to 5 years of graduation will have:

1. Created value to organizations through the analysis, evaluation, and improvement of engineered systems and processes using appropriate industrial engineering methods and tools.
2. Communicated effectively across disciplines and cultures to manage and/or lead activities in support of organizational goals and objectives.
3. Innovated systems and processes, in response to organizational challenges, though the application of structured and unstructured industrial engineering methodologies, including engineering design and problem solving.

Student Outcomes for Industrial Engineering Programs

The OSU Industrial Engineering program prepares its graduates to achieve the Program Educational Objectives above several years into their careers. This is achieved by having students able to perform the following upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
a. Ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy.
b. Ability to accomplish the integration of systems using appropriate analytical, computational, and experimental practices.

**Major Code: 323**

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<thead>
<tr>
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<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
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<tr>
<td>CH 202</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS 1</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>ENGR 112</td>
<td>INTRODUCTION TO ENGINEERING COMPUTING</td>
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<td>ENGR 248</td>
<td>ENGINEERING GRAPHICS AND 3-D MODELING 1</td>
<td>3</td>
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<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course) 1-2</td>
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<tr>
<td>MIME 101</td>
<td>INTRODUCTION TO MIME</td>
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<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>MTH 252</td>
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<td>MTH 254</td>
<td>VECTOR CALCULUS</td>
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<td>PH 211</td>
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<td>WR 121</td>
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**Second Year**

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<td>ENGR 212</td>
<td>DYNAMICS</td>
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<td>ENGR 213</td>
<td>STRENGTH OF MATERIALS</td>
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<td>ENGR 390</td>
<td>ENGINEERING ECONOMY 1</td>
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<td>IE 112</td>
<td>SPREADSHEET SKILLS FOR INDUSTRIAL &amp; MANUFACTURING ENGINEERS 1</td>
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<td>IE 212</td>
<td>COMPUTATIONAL METHODS FOR INDUSTRIAL ENGINEERING 1</td>
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<td>IE 285/MFGE 285</td>
<td>INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING</td>
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<td>ME 250</td>
<td>INTRODUCTION TO MANUFACTURING PROCESSES</td>
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<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
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<td>PH 212</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td>&amp; PH 213</td>
<td>and *GENERAL PHYSICS WITH CALCULUS</td>
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<td>ST 314</td>
<td>INTRODUCTION TO STATISTICS FOR ENGINEERS 1</td>
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<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
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**Third Year**

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<td>MATS 321</td>
<td>INTRODUCTION TO MATERIALS SCIENCE</td>
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<td>MFGE 336</td>
<td>PRODUCTION ENGINEERING</td>
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<td>IE 355</td>
<td>STATISTICAL QUALITY CONTROL</td>
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<td>IE 356</td>
<td>EXPERIMENTAL DESIGN FOR INDUSTRIAL PROCESSES</td>
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<td>IE 366</td>
<td>WORK SYSTEMS ENGINEERING</td>
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<td>IE 367</td>
<td>PRODUCTION PLANNING AND CONTROL</td>
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<td>IE 368</td>
<td>FACILITY DESIGN AND OPERATIONS MANAGEMENT</td>
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<td>Restricted IME Elective</td>
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<td>Biological Science Elective 2</td>
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**Fourth Year**

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<td>IE 412</td>
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<td>SIMULATION AND DECISION SUPPORT SYSTEMS</td>
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**Course Title**

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<th>Hours</th>
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<td>IE 425</td>
<td>INDUSTRIAL SYSTEMS OPTIMIZATION</td>
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<td>IE 426</td>
<td>STOCHASTIC MODELS OF INDUSTRIAL SYSTEMS</td>
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<td>MIME 497</td>
<td>*MIME CAPSTONE DESIGN</td>
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<td>MIME 498</td>
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**Baccalaureate Core Course (BCC)**

1. Prerequisite for several upper-division courses
2. Must be selected to satisfy baccalaureate core requirements
## Code Title Hours

### Required Courses

- **BA 211** FINANCIAL ACCOUNTING 4
- **BA 230** BUSINESS LAW I 4
- **BA 390** MARKETING 4
- **FIN 342** ADVANCED FINANCIAL MANAGEMENT 4
- **IE 470** MANAGEMENT SYSTEMS ENGINEERING 4
- **IE 471** PROJECT MANAGEMENT IN ENGINEERING 3
- **IE 475** ADVANCED MANUFACTURING COSTING TECHNIQUES 3

### Business Engineering Option

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 481)

Students who complete the Business Engineering option will be well prepared to integrate industrial engineering solutions in business settings.

**Option Code: 355**

### Manufacturing Engineering

**Undergraduate Major (BS, HBS)**

The Bachelor of Science and Honors Bachelor of Science degrees in Manufacturing Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The curriculum in Manufacturing Engineering supports a range of career paths in the areas of manufacturing process development, manufacturing systems analysis, and new product development, among others. The degree prepares students for industry, graduate study, or other career paths, specializing or broadening further their knowledge and skills.

### Program Educational Objectives—Manufacturing Engineering

**Note:** The Bachelor of Science and Honors Bachelor of Science degrees in Manufacturing Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org, which requires stated program educational objectives and student outcomes to support these.

OSU Manufacturing Engineering graduates receive an innovative education, and within 3 to 5 years of graduation will have:

1. Created value to organizations through the analysis, evaluation, and improvement of engineered systems and processes using appropriate manufacturing engineering methods and tools.
2. Communicated effectively across disciplines and cultures to manage and/or lead activities in support of organizational goals and objectives.
3. Innovated systems and processes, in response to organizational challenges, though the application of structured and unstructured manufacturing engineering methodologies, including engineering design and problem solving.

### Student Outcomes for Manufacturing Engineering Programs

The OSU Manufacturing Engineering program prepares its graduates to achieve the Program Educational Objectives above several years into their careers. This is achieved by having students able to perform the following upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must
consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
   a. An ability to design manufacturing processes that result in products that meet specific material and other requirements
   b. An ability to design products and the equipment, tooling, and environment necessary for their manufacture
   c. An ability to create competitive advantage through manufacturing planning, strategy, quality, and control
   d. An ability to analyze, synthesize, and control manufacturing operations using statistical methods
   e. An ability to measure manufacturing process variables and develop technical inferences about the process

Major Code: 317

<table>
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<th>Hours</th>
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<tr>
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<tr>
<td>CH 201 CHEMISTRY FOR ENGINEERING MAJORS</td>
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<td>CH 202 CHEMISTRY FOR ENGINEERING MAJORS</td>
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<td>CH 205 LABORATORY FOR CH 202</td>
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<td>COMM 111 or COMM 114 *PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCOURSE</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 112 INTRODUCTION TO ENGINEERING COMPUTING</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 248 ENGINEERING GRAPHICS AND 3-D MODELING</td>
<td>3</td>
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<tr>
<td>HHS 231 *LIFETIME FITNESS FOR HEALTH</td>
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<td>HHS 241 *LIFETIME FITNESS (or any PAC course)</td>
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<td>MIME 101 INTRODUCTION TO MIME</td>
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<td>MTH 251 *DIFFERENTIAL CALCULUS</td>
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<td>MTH 252 INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 254 VECTOR CALCULUS I</td>
<td>4</td>
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<td>PH 211 *GENERAL PHYSICS WITH CALCULUS</td>
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<td>WR 121 *ENGLISH COMPOSITION</td>
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<td>*Perspectives</td>
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<td>Second Year</td>
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<td>ENGR 211 STATICS</td>
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<td>ENGR 212 DYNAMICS</td>
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<td>ENGR 213 STRENGTH OF MATERIALS</td>
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<td>ME 250 INTRODUCTION TO MANUFACTURING PROCESSES</td>
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<td>MTH 256 APPLIED DIFFERENTIAL EQUATIONS</td>
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<td>MTH 341 LINEAR ALGEBRA I</td>
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<td>PH 212 &amp; PH 213 *GENERAL PHYSICS WITH CALCULUS</td>
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<td>ST 314 INTRODUCTION TO STATISTICS FOR ENGINEERS</td>
<td>3</td>
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<td>WR 327 *TECHNICAL WRITING</td>
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<td>*Difference, Power, and Discrimination</td>
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<td>Restricted Electives</td>
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<td>Hours</td>
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<td>Third Year</td>
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<td>ENGR 201 ELECTRICAL FUNDAMENTALS I</td>
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<td>MATS 321 INTRODUCTION TO MATERIALS SCIENCE</td>
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<td>or ENGR 321 or ME 311/NSE 311 INTRODUCTION TO THERMAL-FLUID SCIENCES</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Prerequisite for several upper-division courses
2 Must be selected to satisfy baccalaureate core requirements
3 Must be selected to satisfy the requirements of an approved manufacturing keystone option
This option, taken in conjunction with the BS in Manufacturing Engineering degree, will prepare students for careers in manufacturing industry that focus on production system design, analysis, and improvement.

Option Code: 957

<table>
<thead>
<tr>
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<th>Title</th>
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<td>SPREADSHEET SKILLS FOR INDUSTRIAL &amp; MANUFACTURING ENGINEERS</td>
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<td>IE 212</td>
<td>COMPUTATIONAL METHODS FOR INDUSTRIAL ENGINEERING</td>
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<td>IE 285/MFGE 285</td>
<td>INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING</td>
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<td>IE 355</td>
<td>STATISTICAL QUALITY CONTROL</td>
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<td>IE 366</td>
<td>WORK SYSTEMS ENGINEERING</td>
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<td>IE 367</td>
<td>PRODUCTION PLANNING AND CONTROL</td>
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<tr>
<td>IE 368</td>
<td>FACILITY DESIGN AND OPERATIONS MANAGEMENT</td>
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Restricted Electives

Select a minimum of 8 credits from the following:

- CHE 445 POLYMER ENGINEERING AND SCIENCE
- ECE 418 SEMICONDUCTOR PROCESSING
- IE 411 VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS
- IE 412 INFORMATION SYSTEMS ENGINEERING
- IE 415 SIMULATION AND DECISION SUPPORT SYSTEMS
- IE 418 TELECOMMUNICATION CONCEPTS
- IE 419 WIRELESS NETWORKS
- IE 425 INDUSTRIAL SYSTEMS OPTIMIZATION
- IE 426 STOCHASTIC MODELS OF INDUSTRIAL SYSTEMS
- IE 470 MANAGEMENT SYSTEMS ENGINEERING
- IE 471 PROJECT MANAGEMENT IN ENGINEERING
- IE 475 ADVANCED MANUFACTURING COSTING TECHNIQUES
- MFGE 332 MECHANICAL PROPERTIES OF MATERIALS
- ME 312 THERMODYNAMICS
- ME 316 MECHANICS OF MATERIALS
- ME 331 INTRODUCTORY FLUID MECHANICS
- ME 383 MECHANICAL COMPONENT DESIGN
- ME 480 MATERIALS SELECTION
- ME 499 SPECIAL TOPICS
- MFGE 438 COMPOSITES MANUFACTURING
- RO 421 APPLIED ROBOTICS

Total Hours 39

Option Code: 957

**Product Development Option**

This option is offered within the following major(s):

- Manufacturing Engineering - College of Engineering (p. 483)

This option, taken in conjunction with the BS in Manufacturing Engineering, will prepare students for careers in manufacturing industry that focus on the development of new products and equipment.

Option Code: 833

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<td>ENGR 202</td>
<td>ELECTRICAL FUNDAMENTALS II</td>
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</table>
Materials Science Graduate Major (MS, PhD)

The discipline of materials science is inherently interdisciplinary, involving fundamental aspects of engineering, chemistry, physics, biology, geoscience, and mathematics.

Reflecting this characteristic, the Materials Science Program at Oregon State University, initiated in the 1980s, involves over 60 tenured and tenure-track faculty members spanning the OSU Colleges of Engineering, Science and Forestry. This allows students to earn MS and PhD degrees in Materials Science in many different areas of concentration, including all classes of materials over a wide spectrum of materials behavior. The coursework requirements are extremely flexible to allow students to tailor their program of study to directly support their research activities.

For more information, visit the website (http://matsci.oregonstate.edu/), or contact the Materials Science Graduate Program, School of Mechanical & Industrial Engineering, info-mime@oregonstate.edu, 541-737-3441.

Option Code: 833

Materials Science Graduate Major (MS, PhD)

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<tr>
<td>MATS 322/ENGR 322</td>
<td>MECHANICAL PROPERTIES OF MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>ME 312/NSE 312</td>
<td>THERMODYNAMICS</td>
<td>4</td>
</tr>
<tr>
<td>ME 316</td>
<td>MECHANICS OF MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>ME 317</td>
<td>INTERMEDIATE DYNAMICS</td>
<td>4</td>
</tr>
<tr>
<td>ME 331/NSE 331</td>
<td>INTRODUCTORY FLUID MECHANICS</td>
<td>4</td>
</tr>
<tr>
<td>ME 332/NSE 332</td>
<td>HEAT TRANSFER</td>
<td>4</td>
</tr>
<tr>
<td>ME 373</td>
<td>MECHANICAL ENGINEERING METHODS</td>
<td>3</td>
</tr>
<tr>
<td>ME 383</td>
<td>MECHANICAL COMPONENT DESIGN</td>
<td>4</td>
</tr>
<tr>
<td>ME 430</td>
<td>SYSTEMS DYNAMICS AND CONTROL</td>
<td>4</td>
</tr>
<tr>
<td>or ME 451</td>
<td>INTRODUCTION TO INSTRUMENTATION AND MEASUREMENT SYSTEMS</td>
<td>4</td>
</tr>
</tbody>
</table>

Required Fundamental Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATS 570</td>
<td>STRUCTURE-PROPERTY RELATIONS IN MATERIALS</td>
<td>4</td>
</tr>
<tr>
<td>MATS 581</td>
<td>THERMODYNAMICS OF SOLIDS</td>
<td>4</td>
</tr>
</tbody>
</table>

Core Curriculum

Select 2 courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATS 571</td>
<td>ELECTRONIC PROPERTIES OF MATERIALS</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 582</td>
<td>RATE PROCESSES IN MATERIALS</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 584</td>
<td>ADVANCED FRACTURE OF MATERIALS</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 588</td>
<td>COMPUTATIONAL METHODS IN MATERIALS SCIENCE</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Characterization Requirement

Select at least 1 course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 616</td>
<td>CRYSTALLOGRAPHY AND X-RAY DIFFRACTION</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 555</td>
<td>EXPERIMENTAL TECHNIQUES IN MATERIAL SCIENCE</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 659</td>
<td>PRINCIPLES OF TRANSMISSION ELECTRON MICROSCOPY</td>
<td>3-4</td>
</tr>
<tr>
<td>OC 528</td>
<td>MICROPROBE ANALYSIS</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Processing Requirement

Select at least 1 course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 611/ECE 611</td>
<td>ELECTRONIC MATERIALS PROCESSING</td>
<td>3-4</td>
</tr>
<tr>
<td>ECE 518</td>
<td>SEMICONDUCTOR PROCESSING</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 545</td>
<td>WELDING METALLURGY</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 578</td>
<td>THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES</td>
<td>3-4</td>
</tr>
<tr>
<td>WSE 535</td>
<td>POLYMER SYNTHESIS AND STRUCTURE</td>
<td>3-4</td>
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</table>

Electives

Choose by student, as approved by their major professor

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 507</td>
<td>SEMINAR 1</td>
<td>6-9</td>
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<tr>
<td>ME 507</td>
<td>SEMINAR maximum 3</td>
<td>6-9</td>
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Total Hours 45

PhD

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ENGR 391</td>
<td>ENGINEERING ECONOMICS AND PROJECT MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MATS 322/ENGR 322</td>
<td>MECHANICAL PROPERTIES OF MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>ME 312/NSE 312</td>
<td>THERMODYNAMICS</td>
<td>4</td>
</tr>
<tr>
<td>ME 316</td>
<td>MECHANICS OF MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>ME 317</td>
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<td>4</td>
</tr>
<tr>
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</tr>
<tr>
<td>or ME 451</td>
<td>INTRODUCTION TO INSTRUMENTATION AND MEASUREMENT SYSTEMS</td>
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Required Fundamental Courses

<table>
<thead>
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<th>Code</th>
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Core Curriculum

Select 2 courses from the following:

<table>
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<tr>
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</tr>
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<tbody>
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<td>COMPUTATIONAL METHODS IN MATERIALS SCIENCE</td>
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Characterization Requirement

Select at least 1 course from the following:

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>PRINCIPLES OF TRANSMISSION ELECTRON MICROSCOPY</td>
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<tr>
<td>OC 528</td>
<td>MICROPROBE ANALYSIS</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Processing Requirement

Select at least 1 course from the following:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
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<td>CHE 611/ECE 611</td>
<td>ELECTRONIC MATERIALS PROCESSING</td>
<td>3-4</td>
</tr>
<tr>
<td>ECE 518</td>
<td>SEMICONDUCTOR PROCESSING</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 545</td>
<td>WELDING METALLURGY</td>
<td>3-4</td>
</tr>
<tr>
<td>MATS 578</td>
<td>THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Total Hours 45
Major Code: 3200

Materials Science Graduate Minor

The discipline of materials science is inherently interdisciplinary, involving fundamental aspects of chemistry, physics, biology, geoscience, agricultural science, mathematics, and engineering.

Reflecting this characteristic, the Materials Science Program at Oregon State University, initiated in the 1980s, is distributed over nine departments spanning three OSU colleges. This allows students to earn MS and PhD degrees in Materials Science in many different areas of concentration, including all classes of materials, and in a wide range of materials behavior. The course work requirements are extremely flexible to allow students to tailor their program of study to directly support their research activities.

For more information, visit the website (http://matsci.oregonstate.edu/) or contact the Materials Science Graduate Program, School of Mechanical & Industrial Engineering, info-mime@oregonstate.edu, 541-737-3441.

Minor Code: 3200

Materials Science Minor

Materials Science is a unique blend of disciplines spanning engineering, science, and forestry at OSU.

The Materials Science minor is aimed at students with a wide range of materials-related interests including composites, ceramics, polymers, metallurgy, electronic materials and devices, solid-state chemistry, and solid-state physics.

Minor Code: 764

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATS 321</td>
<td>INTRODUCTION TO MATERIALS SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>or ENGR 321</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>CCE 321</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING MATERIALS</td>
<td></td>
</tr>
<tr>
<td>MATS 322</td>
<td>MECHANICAL PROPERTIES OF MATERIALS</td>
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</tr>
<tr>
<td>ENGR 322</td>
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</tr>
<tr>
<td>Select 19-20 credits from the following five categories:</td>
<td></td>
<td>19-20</td>
</tr>
<tr>
<td>Structure</td>
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<td></td>
</tr>
<tr>
<td>CH 411</td>
<td>INORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 442</td>
<td>PHYSICAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CHE 445</td>
<td>POLYMER ENGINEERING AND SCIENCE</td>
<td></td>
</tr>
<tr>
<td>ECE 411</td>
<td>ENGINEERING MAGNETICS</td>
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</tr>
<tr>
<td>ECE 415</td>
<td>MATERIAL SCIENCE OF NANOTECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>ECE 416</td>
<td>ELECTRONIC MATERIALS AND DEVICES</td>
<td></td>
</tr>
<tr>
<td>MATS 455</td>
<td>EXPERIMENTAL TECHNIQUES IN MATERIAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>MATS 478</td>
<td>THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES</td>
<td></td>
</tr>
<tr>
<td>WISE 111</td>
<td>RENEWABLE MATERIALS FOR A GREEN PLANET</td>
<td></td>
</tr>
<tr>
<td>WISE 210</td>
<td>RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION</td>
<td></td>
</tr>
<tr>
<td>WISE 321</td>
<td>CHEMISTRY OF RENEWABLE MATERIALS</td>
<td></td>
</tr>
<tr>
<td>WISE 322</td>
<td>PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS</td>
<td></td>
</tr>
<tr>
<td>WISE 324</td>
<td>RENEWABLE MATERIALS LABORATORY</td>
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<tr>
<td>Properties</td>
<td></td>
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<tr>
<td>CCE 422</td>
<td>GREEN BUILDING MATERIALS</td>
<td></td>
</tr>
<tr>
<td>CH 412</td>
<td>INORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CHE 445</td>
<td>POLYMER ENGINEERING AND SCIENCE</td>
<td></td>
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<tr>
<td>ECE 411</td>
<td>ENGINEERING MAGNETICS</td>
<td></td>
</tr>
<tr>
<td>ECE 416</td>
<td>ELECTRONIC MATERIALS AND DEVICES</td>
<td></td>
</tr>
<tr>
<td>MATS 455</td>
<td>EXPERIMENTAL TECHNIQUES IN MATERIAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>MATS 478</td>
<td>THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES</td>
<td></td>
</tr>
<tr>
<td>MATS 499</td>
<td>SPECIAL TOPICS (Physical Metallurgy)</td>
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</tr>
<tr>
<td>ME 484</td>
<td>FRACTURE OF MATERIALS</td>
<td></td>
</tr>
</tbody>
</table>
Advanced Manufacturing Graduate Option

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 479)
- Mechanical Engineering - College of Engineering (p. 488)

The Advanced Manufacturing graduate option is offered under both the Industrial Engineering and Mechanical Engineering majors. Advanced Manufacturing (AM) focuses on the integration of nanomaterial synthesis and microfabrication techniques and conventional macroscale manufacturing technologies to produce nano- and microscale systems in an economically, environmentally, and socially sustainable manner.

Option Code: 3191

A minimum of 12 credits from the following set of specific courses will be required of students wishing to declare the IE Advanced Manufacturing (AM) graduate option.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFGE 531</td>
<td>MICROMANUFACTURING</td>
<td></td>
</tr>
<tr>
<td>MFGE 538</td>
<td>COMPONENT MANUFACTURING</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 12

Design Graduate Option

This option is offered within the following major(s):

- Mechanical Engineering - College of Engineering (p. 488)

Option Code: 3215

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 507</td>
<td>SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>ME 511</td>
<td>PRECISION MACHINE DESIGNS</td>
<td></td>
</tr>
<tr>
<td>ME 512</td>
<td>DESIGN OF MECHANISMS</td>
<td></td>
</tr>
<tr>
<td>ME 515</td>
<td>RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN</td>
<td></td>
</tr>
<tr>
<td>ME 516</td>
<td>MODELING AND ANALYSIS OF COMPLEX SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>ME 517</td>
<td>OPTIMIZATION IN DESIGN</td>
<td></td>
</tr>
<tr>
<td>ME 611</td>
<td>MODERN PRODUCT DESIGN</td>
<td></td>
</tr>
<tr>
<td>MFGE 536</td>
<td>LEAN MANUFACTURING SYSTEMS ENGINEERING</td>
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</tr>
</tbody>
</table>

Total Hours: 16

Minor Code: 764

Mechanical Engineering Graduate Major (MENG, MS, PhD)

The School of Mechanical, Industrial, and Manufacturing Engineering offers graduate programs leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees. Master's degree candidates may pursue thesis or nonthesis options; students in the nonthesis option must complete additional course work where an individual project may be included.

The mechanical engineering field is diverse, therefore, research activities in the school encompass a broad range of technical endeavors. Areas of research include applied mechanics, solid mechanics, biomechanics, dynamics, stress analysis, design, systems and control, energy, applied thermodynamics, heat transfer, fluid mechanics, metallurgy, and materials science.

In addition, research activities have been directed toward areas of current interest and need, including wind energy, microscale energy conversion, combustion, composite materials, superconductors, advanced materials, impact dynamics, mechatronics, microfluidic devices, diagnostics in design, design for manufacture and computer-aided design and manufacturing, design and control of complex systems.

Major Code: 3210

Minor Code: 764

Option Code: 3215

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 507</td>
<td>SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>ME 511</td>
<td>PRECISION MACHINE DESIGNS</td>
<td></td>
</tr>
<tr>
<td>ME 512</td>
<td>DESIGN OF MECHANISMS</td>
<td></td>
</tr>
<tr>
<td>ME 515</td>
<td>RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN</td>
<td></td>
</tr>
<tr>
<td>ME 516</td>
<td>MODELING AND ANALYSIS OF COMPLEX SYSTEMS</td>
<td></td>
</tr>
<tr>
<td>ME 517</td>
<td>OPTIMIZATION IN DESIGN</td>
<td></td>
</tr>
<tr>
<td>ME 611</td>
<td>MODERN PRODUCT DESIGN</td>
<td></td>
</tr>
<tr>
<td>MFGE 536</td>
<td>LEAN MANUFACTURING SYSTEMS ENGINEERING</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 16

Option Code: 3215
Engineering Management Graduate Option

This option is offered within the following major(s):

- Industrial Engineering - College of Engineering (p. 479)
- Mechanical Engineering - College of Engineering (p. 488)

Also available via Ecampus.

The graduate option in Engineering Management at Oregon State University is designed for engineers who are conversant in the language and methods of engineering and technology who are motivated to become managers and leaders. The curriculum will equip engineers with the knowledge and skills necessary to effectively manage technical resources to accomplish complex technical tasks.

Option Code: 3195

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE 571</td>
<td>PROJECT MANAGEMENT IN ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>IE 581</td>
<td>OPERATIONS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>IE 582</td>
<td>INTRODUCTION TO MANAGEMENT FOR ENGINEERS AND</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>SCIENTISTS</td>
<td></td>
</tr>
<tr>
<td>IE 583</td>
<td>ADVANCED ENGINEERING ECONOMICS ANALYSIS</td>
<td>4</td>
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<td></td>
<td>Total Hours</td>
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</tbody>
</table>

Option Code: 3195

Materials Mechanics Graduate Option

This option is offered within the following major(s):

- Mechanical Engineering - College of Engineering (p. 488)

Option Code: 3220

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 507</td>
<td>SEMINAR (Materials Science)</td>
<td>1</td>
</tr>
<tr>
<td>ME 520</td>
<td>APPLIED STRESS ANALYSIS</td>
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</tr>
<tr>
<td>ME 570</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>ME 583</td>
<td>COMPOSITE MATERIALS</td>
<td>3-4</td>
</tr>
<tr>
<td>ME 584</td>
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<tr>
<td>ME 585</td>
<td>FATIGUE OF MATERIALS</td>
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</tr>
<tr>
<td>ME 523</td>
<td>ADVANCED STRESS ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>ME 524</td>
<td>FINITE ELEMENT MODELING OF MECHANICAL</td>
<td></td>
</tr>
<tr>
<td>ME 553</td>
<td>SYSTEMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STRUCTURE AND MECHANICS LABORATORY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following in mechanical behavior:</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>Select one of the following in mechanics:</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>ME 531 LINEAR MULTIVARIABLE CONTROL SYSTEMS I</td>
<td></td>
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<tr>
<td></td>
<td>ME 532 LINEAR MULTIVARIABLE CONTROL SYSTEMS II</td>
<td></td>
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<tr>
<td></td>
<td>ME 533 NONLINEAR DYNAMIC ANALYSIS</td>
<td></td>
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<tr>
<td></td>
<td>ROB 521 RESEARCH ROBOTICS</td>
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<td></td>
<td>ROB 537 LEARNING-BASED CONTROL</td>
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<td></td>
<td>ROB 538 AUTONOMOUS AGENTS AND MULTI-AGENT SYSTEMS</td>
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<td>Total Hours</td>
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</tr>
</tbody>
</table>

Option Code: 3220

Robotics Graduate Option

This option is offered within the following major(s):

- Mechanical Engineering - College of Engineering (p. 488)

Option Code: 3225

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 507</td>
<td>SEMINAR (Robotics and Control)</td>
<td>1</td>
</tr>
<tr>
<td>ME 531</td>
<td>LINEAR MULTIVARIABLE CONTROL SYSTEMS I</td>
<td>16</td>
</tr>
<tr>
<td>ME 532</td>
<td>LINEAR MULTIVARIABLE CONTROL SYSTEMS II</td>
<td></td>
</tr>
<tr>
<td>ME 533</td>
<td>NONLINEAR DYNAMIC ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>ROB 521</td>
<td>RESEARCH ROBOTICS</td>
<td></td>
</tr>
<tr>
<td>ROB 537</td>
<td>LEARNING-BASED CONTROL</td>
<td></td>
</tr>
<tr>
<td>ROB 538</td>
<td>AUTONOMOUS AGENTS AND MULTI-AGENT SYSTEMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>17</td>
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</tbody>
</table>

Option Code: 3225

Renewable Energy Graduate Option

This option is offered within the following major(s):

- Mechanical Engineering - College of Engineering (p. 488)

This graduate option within the Mechanical Engineering graduate major distinguishes an area of interdisciplinary specialization, Renewable Energy (RE).

Renewable Energy is inherently interdisciplinary and thus is being proposed as an interdisciplinary option within ME which requires students to select 16 credits of ME courses from across all four ME primary graduate options and then choose from a set of courses which equip students to understand the underlying physical phenomena governing renewable energy technologies and be able to understand overarching themes in US energy policy pertaining to renewables.

Students wishing to declare the ME Renewable Energy (RE) graduate option must first fulfill core mechanical engineering requirements in one of two ways:

1. Declare an interdisciplinary option in mechanical engineering, or
2. Fulfill the requirements of one of the four ME Primary Options.

Option Code: 3222

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CE 530</td>
<td>OCEAN WAVE MECHANICS I</td>
<td></td>
</tr>
<tr>
<td>CE 539</td>
<td>DYNAMICS OF OCEAN STRUCTURES</td>
<td></td>
</tr>
<tr>
<td>CE 547</td>
<td>OCEAN AND COASTAL ENGINEERING MEASUREMENTS</td>
<td></td>
</tr>
<tr>
<td>CHE 550</td>
<td>CONVENTIONAL AND ALTERNATIVE ENERGY SYSTEMS</td>
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<tr>
<td>CHE 551</td>
<td>SOLAR ENERGY TECHNOLOGIES</td>
<td></td>
</tr>
<tr>
<td>ECE 530</td>
<td>CONTEMPORARY ENERGY APPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>ECE 532</td>
<td>DYNAMICS OF ELECTROMECHANICAL ENERGY CONVERSION</td>
<td></td>
</tr>
<tr>
<td>ECE 533</td>
<td>POWER SYSTEM ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>ME 507</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>ME 543</td>
<td>RENEWABLE ENERGY THERMAL FLUID SYSTEMS</td>
<td></td>
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<tr>
<td>PS 573</td>
<td>US ENERGY POLICY</td>
<td></td>
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<tr>
<td>PS 578</td>
<td>RENEWABLE ENERGY POLICY</td>
<td></td>
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<td>Total Hours</td>
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Option Code: 3222
**Thermal Fluid Sciences Graduate Option**

This option is offered within the following major(s):

- Mechanical Engineering - College of Engineering (p. 488)

**Option Code: 3230**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 507</td>
<td>SEMINAR (Thermal Fluid Science Seminar)</td>
<td>1</td>
</tr>
<tr>
<td>ME 526</td>
<td>NUMERICAL METHODS FOR ENGINEERING ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>ME 550</td>
<td>APPLIED HEAT TRANSFER</td>
<td>4</td>
</tr>
<tr>
<td>ME 552</td>
<td>MEASUREMENTS IN FLUID MECHANICS AND HEAT TRANSFER</td>
<td>4</td>
</tr>
<tr>
<td>ME 560</td>
<td>INTERMEDIATE FLUID MECHANICS</td>
<td>4</td>
</tr>
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</table>

Total Hours: 16

**Option Code: 3230**

**Mechanical Engineering Graduate Minor**

**Minor Code: 3210**

**Mechanical Engineering Undergraduate Major (BS, HBS)**

The Bachelor of Science and Honors Bachelor of Science degrees in Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

At Oregon State University, the mechanical engineering focal areas include design, mechanics materials, robotics & control, and thermal–fluid sciences.

**Program Educational Objectives—Mechanical Engineering**

**Note:** The Bachelor of Science and Honors Bachelor of Science degrees in Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org, which requires stated program educational objectives and student outcomes to support these.

OSU Mechanical Engineering graduates receive an innovative education, and within 3 to 5 years of graduation will have:

1. Created value to organizations through the analysis, evaluation, and improvement of engineered systems and processes using appropriate mechanical engineering methods and tools.
2. Communicated effectively across disciplines and cultures to manage and/or lead activities in support of organizational goals and objectives.
3. Innovated systems and processes, in response to organizational challenges, though the application of structured and unstructured mechanical engineering methodologies, including engineering design and problem solving.

**Student Outcomes for Mechanical Engineering Programs**

The OSU Mechanical Engineering program prepares its graduates to achieve the Program Educational Objectives above several years into their careers. This is achieved by having students able to perform the following upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
   a. Ability to apply principles of engineering, basic science and mathematics (including multi-variate calculus and differential equations).
   b. Ability to model, analyze, design, and realize physical systems, components or processes.
   c. Ability to work professionally in either thermal or mechanical systems areas.

**Major Code: 321**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
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<tr>
<td>CH 202</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS 1</td>
<td>3</td>
</tr>
<tr>
<td>CH 205</td>
<td>LABORATORY FOR CH 202</td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING 2 or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>or COMM 114</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH 2</td>
<td>2</td>
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<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course) 2</td>
<td>1</td>
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<tr>
<td>ENGR 248</td>
<td>ENGINEERING GRAPHS AND 3-D MODELING 1</td>
<td>3</td>
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<tr>
<td>MIME 101</td>
<td>INTRODUCTION TO MIME</td>
<td>3</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
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<tr>
<td>PH 213</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>*Perspectives Courses 2</td>
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Total Hours: 47

**Second Year**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENGR 112</td>
<td>INTRODUCTION TO ENGINEERING COMPUTING</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 201</td>
<td>ELECTRICAL FUNDAMENTALS 1</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 202</td>
<td>ELECTRICAL FUNDAMENTALS II</td>
<td>3</td>
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<td>ENGR 211</td>
<td>STATICS</td>
<td>3</td>
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<tr>
<td>ENGR 212</td>
<td>DYNAMICS</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 213</td>
<td>STRENGTH OF MATERIALS 1</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 391</td>
<td>ENGINEERING ECONOMICS AND PROJECT MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
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</table>
**MTH 306** or **MTH 341**
MATRIX AND POWER SERIES METHODS or LINEAR ALGEBRA I

**PH 212**
**PH 213**
*GENERAL PHYSICS WITH CALCULUS* or *GENERAL PHYSICS WITH CALCULUS*

**ST 314**
INTRODUCTION TO STATISTICS FOR ENGINEERS

**WR 327**
*TECHNICAL WRITING*

**Biological Science Course**

*Difference, Power, and Discrimination Elective*

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**Third Year**

**MATS 321**
INTRODUCTION TO MATERIALS SCIENCE

**MATS 322**
MECHANICAL PROPERTIES OF MATERIALS

**ME 250**
INTRODUCTION TO MANUFACTURING PROCESSES

**ME 311/NSE 311**
INTRODUCTION TO THERMAL-FLUID SCIENCES

**ME 312/NSE 312**
THERMODYNAMICS

**ME 316**
MECHANICS OF MATERIALS

**ME 317**
INTERMEDIATE DYNAMICS

**ME 331/NSE 331**
INTRODUCTORY FLUID MECHANICS

**ME 332/NSE 332**
HEAT TRANSFER

**ME 373**
MECHANICAL ENGINEERING METHODS

**ME 382**
INTRODUCTION TO DESIGN

**ME 383**
MECHANICAL COMPONENT DESIGN

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**Fourth Year**

**ME 430/EC 430**
SYSTEMS DYNAMICS AND CONTROL

**ME 451**
INTRODUCTION TO INSTRUMENTATION AND MEASUREMENT SYSTEMS

**MIME 497**
*MIME CAPSTONE DESIGN*

**MIME 498**
*MIME CAPSTONE DESIGN*

**ME 531**
LINEAR MULTIVARIABLE CONTROL SYSTEMS I

**ME 533**
NONLINEAR DYNAMIC ANALYSIS

**ROB 514**
INTRODUCTION TO ROBOTICS

**ROB 521**
RESEARCH ROBOTICS

**ROB 537**
LEARNING-BASED CONTROL

**ROB 534**
SEQUENTIAL DECISION MAKING IN ROBOTICS

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**Total Hours for MEng/MS**

45

**Total Hours for PhD**

108

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**Major Code: 3250**

**Robotics Graduate Minor**

For additional information about the Robotics graduate minor, please visit the program website (http://robotics.oregonstate.edu/).

**Minor Code: 3255**

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**Major Code: 321**

**Robotics Graduate Major (MENG, MS, PhD)**

**Graduate Areas of Concentration**

*Assistive robots, autonomous robots, human-robot interaction, legged locomotion, manipulation, mobile robots, multi-robot coordination*

The interdisciplinary robotics program offers Master of Engineering (MEng), Master of Science (MS) and Doctor of Philosophy (PhD) degrees in Robotics.

MS degree candidates may pursue thesis or nonthesis options. A coursework-only MEng degree may only be pursued with special permission from a Robotics faculty member. The PhD program prepares students for careers in industry, research laboratories or universities. Students are encouraged to develop programs of study in close cooperation with the faculty members in their areas of interest.

The program includes core areas of robotics, including actuation, locomotion, manipulation, dynamics, control, sensing, artificial intelligence, and human/robot interactions.

Additional information concerning courses, advising procedures, faculty, and many other aspects of the program may be found in the programs’ website (https://engineering.oregonstate.edu/robotics/).

**Major Code: 3250**

**Robotics Graduate Minor**

For additional information about the Robotics graduate minor, please visit the program website (http://robotics.oregonstate.edu/).

**Minor Code: 3255**

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**Major Code: 3250**

**School of Nuclear Science and Engineering**

The School of Nuclear Science and Engineering provides world-class education so students can become industry, academic, and policy leaders driving the future of nuclear science worldwide.

The School offers BS, MEng, MS, and PhD degrees in Nuclear Engineering as well as BS, MHP, MS, and PhD degrees in Radiation Health Physics. A premedical option is available for those seeking a BS in Radiation Health Physics.

World-class facilities are utilized as a part of students’ education to further gain an understanding on relevant nuclear engineering and radiation health physics subject matters. These facilities reside within the Radiation Center Building on the Oregon State University campus and comprise a 1 MWth TRIGA Reactor, the Advanced Thermal Hydraulic Laboratory, the Advanced Nuclear Science and Engineering Laboratory, Advanced Nuclear Instrumentation Development Laboratory, and a Radiological Research Laboratory. Instruction is integrated with an extensive research program and opportunities to participate at both the undergraduate and graduate levels.

The goals of the nuclear engineering and radiation health physics undergraduate curricula are to prepare students for careers related to the many beneficial uses of nuclear technology and energy. Nuclear engineers apply scientific principles to the research, design, and operation of a wide variety of nuclear technology applications including power generation, medicine, and radioactive waste management.

Radiation health physicists study methods used to protect people and
their environment from radiation hazards while enabling the beneficial uses of radiation and radioactive materials. In addition, an emphasis is provided in nuclear instrumentation, nuclear systems and materials, radiation protection, reactor analysis and nuclear power economics and, particularly, safety and regulation in nuclear operations.

**Undergraduate Programs**

**Majors**
- Nuclear Engineering (p. 501)
- Radiation Health Physics (p. 504)
  **Option:**
  - Radiation Health Physics – Pre Med

**Minors**
- Nuclear Engineering (p. 500)
- Radiation Health Physics (p. 503)

**Graduate Programs**

**Majors**
- Medical Physics (p. 499)
- Nuclear Engineering (p. 499)
- Radiation Health Physics (p. 502)

**Minors**
- Nuclear Engineering (p. 500)
- Radiation Health Physics (p. 503)

Kathryn A. Higley, School Head, Radiation Health Physics Program
Coordinator
151 Batcheller Hall
1791 SW Campus Way
Oregon State University
Corvallis, OR 97331-5902
Phone: 541-737-2343
Email: nuc_engr@ne.oregonstate.edu
Website: http://ne.oregonstate.edu/

**Faculty**

**Professors** Hamby, Higginbotham, Higley, Marcum, Meyer, T. Palmer, Paulenova, Woods, Wu
**Associate Professors** Farsoni, C. Palmer, Reese, Yang
**Assistant Professors** Briggs, Chen, Gutowska, Mignot
**Instructors** Crilly, Keller, Kishore, Laub, Merz, Pillai, Ranbar, Schickler, Tanyi, Zhang
**Emeriti** Binney, Klein, Ringle, Reyes, Robinson

1 Certified Health Physicist
2 Licensed Professional Engineer

**Nuclear Science & Engineering**

NSE 114. INTRO TO NUCLEAR ENGINEERING AND RADIATION HEALTH PHYSICS I. (3 Credits)
Introduction to the nuclear engineering and radiation health physics fields; problem-solving techniques; careers in the nuclear industry; nuclear history; elementary nuclear and reactor physics; basic nuclear fission and fusion theory; reactor types; nuclear safety; nuclear fuel cycle; and radiation protection.
Equivalent to: NE 114, RHP 114

NSE 115. INTRO TO NUCLEAR ENGINEERING AND RADIATION HEALTH PHYSICS II. (3 Credits)
Introduction to the nuclear engineering and radiation health physics fields; problem-solving techniques; careers in the nuclear industry; nuclear history; elementary nuclear and reactor physics; basic nuclear fission and fusion theory; reactor types; nuclear safety; nuclear fuel cycle; and radiation protection.
Equivalent to: NE 115, RHP 115

NSE 233. MATHEMATICAL METHODS FOR NSE. (3 Credits)
Development and application of analytical and numerical methods with applications to problems in the NE/RHP field. Major topics will include solution of ODEs and systems of ODEs, root finding techniques and numerical integration and differentiation. Major applications will include solution of the Bateman Equations and solution of the diffusion equation.
**Prerequisites:** MTH 256 with C or better or MTH 256H with C or better

NSE 234. NUCLEAR AND RADIATION PHYSICS I. (3 Credits)
Relativistic dynamics; basic nuclear physics; basic quantum mechanics; radioactivity; electromagnetic waves; interaction of ionizing radiation with matter; cross sections; basic atomic structure.
**Prerequisites:** MTH 251 with C or better or MTH 251H with C or better
Equivalent to: NE 234, RHP 234

NSE 235. NUCLEAR AND RADIATION PHYSICS II. (3 Credits)
Radioactivity; radioactive decay modes; decay kinetics, interaction of neutrons with matter; nuclear reactions; fission and fusion basics; cross sections.
**Prerequisites:** (NSE 234 with C or better or NE 235 with C or better or RHP 234 with C or better) and (MTH 252 [C] or MTH 252H [C])
Equivalent to: NE 235, RHP 235

NSE 236. NUCLEAR RADIATION DETECTION AND INSTRUMENTATION. (4 Credits)
Principles and mechanisms underlying nuclear radiation detection and measurements; operation of nuclear electronic laboratory instrumentation; application of gas-filled, scintillation and semiconductor laboratory detectors for measurement of alpha, beta, gamma, and neutron radiation; experimental investigation of interactions of radiation with matter. Lec/lab.
**Prerequisites:** NSE 235 with C or better or NE 235 with C or better or RHP 235 with C or better
Equivalent to: NE 236, RHP 236

NSE 311. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, moment and the second law of thermodynamics are included. CROSSTLISTED as ME 311/NSE 311.
**Prerequisites:** (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C])
Equivalent to: ME 311, ME 311H, NE 311, NE 311H, NSE 311

NSE 311H. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, moment and the second law of thermodynamics are included. CROSSTLISTED as ME 311/NSE 311.
**Attributes:** HNRS – Honors Course Designator
**Prerequisites:** (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 311, ME 311H, NE 311H, NSE 311
NSE 312. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Prerequisites: (NSE 311 with C or better or NSE 311H with C or better or NE 311 with C or better or NE 311H with C or better or ME 311 with C or better or ME 311H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 312, ME 312H, NE 312H, NSE 312H

NSE 312H. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Attributes: HNRS – Honors Course Designator
Prerequisites: (NSE 311 with C or better or NSE 311H with C or better or NE 311 with C or better or NE 311H with C or better or ME 311 with C or better or ME 311H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 312, ME 312H, NSE 312

NSE 319. *SOCIETAL ASPECTS OF NUCLEAR TECHNOLOGY. (3 Credits)
Description and discussion of nuclear-related issues as they impact society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: NE 319

NSE 331. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/ NSE 331.
Prerequisites: (MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C]) and (ENGR 311 [C] or ENGR 311H [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 331, ME 331H, NE 331, NE 331H, NSE 331H

NSE 331H. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/ NSE 331.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C]) and (ENGR 311 [C] or ENGR 311H [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 331, ME 331H, NE 331, NE 331H, NSE 331H

NSE 332. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C] or ME 311 [C] or ME 311H [C] or ME 331 [C] or ME 331H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 332, ME 332H, NE 332, NE 332H, NSE 332H

NSE 332H. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C] or ME 311 [C] or ME 311H [C] or ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C])
Equivalent to: ME 332, ME 332H, NE 332, NE 332H, NSE 332

NSE 401. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: NE 401
This course is repeatable for 99 credits.

NSE 403. THESIS/DISSENTATION. (1-16 Credits)
Equivalent to: NE 403
This course is repeatable for 16 credits.

NSE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: NE 405
This course is repeatable for 16 credits.

NSE 406. PROJECTS. (1-16 Credits)
Equivalent to: NE 406
This course is repeatable for 16 credits.

NSE 407. SEMINAR. (1 Credit)
Graded P/N.
Equivalent to: RHP 407
This course is repeatable for 16 credits.

NSE 410. INTERNSHIP. (1-12 Credits)
Supervised technical work experience at approved organizations. Graded P/N.
Equivalent to: RHP 410
This course is repeatable for 12 credits.

NSE 415. NUCLEAR RULES AND REGULATIONS. (2 Credits)
An introduction to the key nuclear regulatory agencies; major nuclear legislation; current radiation protection standards and organizations responsible for their implementation. Offered alternate years.
Prerequisites: NSE 236 with C or better
Equivalent to: NE 415, RHP 415
Recommended: NSE 481 or NE 481 or RHP 481

NSE 429. SELECTED TOPICS IN NUCLEAR ENGINEERING. (1-3 Credits)
Topics associated with nuclear engineering not covered in other undergraduate courses; topics may vary from year to year.
Equivalent to: NE 429
This course is repeatable for 45 credits.

NSE 435. RADIATION SHIELDING AND EXTERNAL DOSIMETRY. (4 Credits)
Theoretical principles of shielding for neutron and gamma radiation; external dosimetry fundamentals for neutrons, photons, and charged particles; applications to problems of practical interest; analytical, numerical, and computer solutions emphasized.
Prerequisites: (NSE 234 with C or better or NE 234 with C or better or RHP 234 with C or better) and (NSE 235 [C] or NE 235 [C] or RHP 235 [C]) and (NSE 481 [C] or NE 481 [C] or RHP 481 [C])
Equivalent to: NE 435
NSE 440. NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT. (4 Credits)
Mining, milling, conversion, enrichment, fuel fabrication, reprocessing, and waste management of nuclear fuel, including disposal of low- and high-level radioactive waste.
Prerequisites: NSE 235 with C or better or NE 235 with C or better or RHP 235 with C or better
Equivalent to: NE 440

NSE 450. PRINCIPLES OF NUCLEAR MEDICINE. (3 Credits)
Basic principles of nuclear medicine; detectors; radiopharmaceuticals; dosimetry; imaging procedures.

NSE 451. NEUTRONIC ANALYSIS I. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (NSE 235 [C] or NE 235 [C] or RHP 235 [C]) and (NSE 333 [C] or NE 333 [C] or RHP 333 [C])
Equivalent to: NE 451

NSE 452. NEUTRONIC ANALYSIS II. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions. Lec/lab.
Prerequisites: NSE 451 with C or better or NE 451 with C or better
Equivalent to: NE 452

NSE 455. REACTOR OPERATOR TRAINING I. (3 Credits)
The Oregon State University TRIGA reactor Operator Training I class is one of a two-course series. Students interested in participating in this course are expected to enroll in both the NSE 455/NSE 555 and NSE 456/NSE 556 classes taught during spring and summer terms. Students successfully completing the NSE 455/NSE 555 and NSE 456/NSE 556 series will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Prerequisites: (NSE 236 with C or better or NE 236 with C or better or RHP 236 with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: NE 455

NSE 456. REACTOR OPERATOR TRAINING II. (4 Credits)
The Oregon State University TRIGA reactor Operator Training II class is one of a two-course series. Students interested in participating in this course must have already taken and successfully passed NSE 455/NSE 555. Students successfully completing NSE 455/NSE 555 will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Prerequisites: NSE 455 with C or better or NE 455 with C or better
Equivalent to: NE 456

NSE 457. NUCLEAR REACTOR LABORATORY. (2 Credits)
Experimental investigation of the principles of nuclear reactor operation. Use of the OSU TRIGA Reactor and other laboratory facilities. Preparation and presentation of laboratory reports. Lec/lab.
Prerequisites: (NSE 451 with C or better or NE 451 with C or better or NSE 551 with C or better or NE 551 with C or better) and (NSE 452 [C] or NE 452 [C] or NSE 552 [C] or NE 552 [C])
Equivalent to: NE 457

NSE 458. NUCLEAR REACTOR THERMAL HYDRAULICS. (4 Credits)
Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single- and two-phase flow behavior. Advanced thermal hydraulic computer codes.
Prerequisites: ME 332 with C or better or ME 332H with C or better or NSE 332 with C or better or NSE 332H with C or better or NE 332 with C or better or NE 332H with C or better
Equivalent to: NE 458

NSE 467. NUCLEAR REACTOR THERMAL HYDRAULICS. (4 Credits)
Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single- and two-phase flow behavior. Advanced thermal hydraulic computer codes. USE OF THE OSU TRIGA REACTOR AND OTHER LABORATORY FACILITIES. LEC/LAB.
Prerequisites: ME 332 with C or better or ME 332H with C or better or NSE 332 with C or better or NSE 332H with C or better or NE 332 with C or better or NE 332H with C or better
Equivalent to: NE 458

NSE 473. NUCLEAR REACTOR SYSTEMS ANALYSIS. (3 Credits)
Analysis of nuclear light water reactor (pressurized water reactor and boiling water reactor) design and operation, including the nuclear steam supply system, engineered safety features and balance of plant systems; regulatory design requirements; industry standards; plant engineering and instrumentation drawings. Advanced reactor system designs.
Prerequisites: NSE 452 with C or better or NE 452 with C or better
Equivalent to: NE 473

NSE 474. NUCLEAR SYSTEMS DESIGN I. (4 Credits)
Part I of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NSE 481 with C or better
Equivalent to: NE 474, RHP 474

NSE 475. NUCLEAR SYSTEMS DESIGN II. (4 Credits)
Part II of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NSE 452 with C or better or NE 452 with C or better and (NSE 474 with C or NE 474 with C or RHP 474 with C)
Equivalent to: RHP 475

NSE 481. RADIATION PROTECTION. (4 Credits)
Fundamental principles and theory of radiation protection; regulatory agencies, dose units; source of radiation; biological effects and risk; dose limits; applications of external and internal dosimetry; shielding and atmospheric dispersion.
Prerequisites: NSE 235 with C or better or NE 235 with C or better or RHP 235 with C or better
Equivalent to: NE 481, RHP 481

NSE 483. RADIATION BIOLOGY. (3 Credits)
Biological effects of ionizing radiation at the molecular, cellular, and organismal levels with emphasis on vertebrates; both acute and chronic radiation effects are considered.
Prerequisites: NSE 481 with C or better or RHP 481 with C or better or MP 481 with C or better
Equivalent to: MP 483
NSE 488. Radioecology. (3 Credits)
Radionuclides in the environment: their measurement and identification, uptake and transfer through food chains. Effect of radiation on natural populations of plants and animals.
Prerequisites: NSE 481 with C or better or RHP 481 with C or better or NE 481 with C or better
Equivalent to: RHP 488

NSE 499. Special Topics. (0-16 Credits)
Equivalent to: NE 499
This course is repeatable for 16 credits.

NSE 501. Research. (1-16 Credits)
Equivalent to: MP 501
This course is repeatable for 99 credits.

NSE 503. Thesis. (1-16 Credits)
Equivalent to: MP 503
This course is repeatable for 99 credits.

NSE 505. Reading and Conference. (1-16 Credits)
Equivalent to: MP 505
This course is repeatable for 16 credits.

NSE 506. Projects. (1-16 Credits)
Equivalent to: MP 506
This course is repeatable for 16 credits.

NSE 507. Seminar. (1 Credit)
Graded P/N.
Equivalent to: MP 507
This course is repeatable for 16 credits.

NSE 510. Internship. (1-12 Credits)
Supervised technical work experience at approved organizations. Graded P/N.
Equivalent to: MP 510
This course is repeatable for 16 credits.

NSE 515. Nuclear Rules and Regulations. (2 Credits)
An introduction to the key nuclear regulatory agencies; major nuclear legislation; current radiation protection standards and organizations responsible for their implementation. Offered alternate years.
Equivalent to: NE 515, RHP 515

NSE 516. Radiochemistry. (4 Credits)
Selected methods in radiochemical analysis. Actinide chemistry, activation analysis, radionuclide solvent extraction, and microbial reactions with radionuclides. Designed for majors in chemistry, chemical engineering, nuclear engineering, and radiation health physics. Lec/lab. CROSSLISTED as CH 516/NSE 516.
Prerequisites: (NSE 531 with C or better or NE 531 with C or better or RHP 531 with C or better) and (NSE 536 [C] or NE 536 [C] or RHP 536 [C])
Equivalent to: CH 516, RHP 516

NSE 517. Radionuclides in Life Sciences. (4 Credits)
Chemistry of actinides and fission products, radioseparations, selected medical generators, radiolabeling of organic molecules. Designed for majors in medical physics, radiation health physics, chemistry, pharmacy.
Prerequisites: (NSE 531 with C or better or NE 531 with C or better or RHP 531 with C or better) and (NSE 536 [C] or NE 536 [C] or RHP 536 [C])
Equivalent to: MP 517, RHP 517

NSE 519. Radiochemical Analysis. (4 Credits)
Hands-on learning of radiochemistry, practical training with open reaction sources for preparation of irradiation targets, counting samples from contaminated soils or separation of medical radionuclides. Fundamentals of chemical dosimetry are also covered. Designed for a broad range of majors in chemistry, nuclear engineering, radiation health physics, radioecology, chemical and environmental engineering. Lec/lab. The lecture part of the course also is delivered online as video stream via Canvas.
Prerequisites: NSE 536 with C or better or NE 536 with C or better or RHP 536 with C or better
Equivalent to: NE 519, RHP 519
Recommended: NSE 516

NSE 521. Radiological Anatomy and Physiology. (4 Credits)
Anatomy and physiology with correlating images for use by medical physicists, therapists, dosimetrists. This course adheres to the AAMD requirements for Cross Sectional Anatomy.
Equivalent to: MP 521, RHP 521

NSE 522. Nuclear Security Science. (4 Credits)
Explores the nuclear fuel cycle from the perspective of nuclear security and safeguards and in the context of current international nuclear policies. Nuclear threats are balanced with the past history of nuclear weapons use, current nonproliferation technology, and the future international growth of the nuclear industry. Critical thinking will be assessed by way of in-class discussions, journal article reviews, written analysis of fuel cycle signatures, and conducting research. Signatures including radiological and morphological characteristics of nuclear material is introduced as well as the techniques for the detection of special nuclear materials.

NSE 525. Nuclear Security System Design. (3 Credits)
Studies the science and engineering associated with the design, evaluation, and implementation of systems to secure nuclear and radiological materials. Topics include adversary characterization, target categorization and the consequences of failure to protect targets, detection and delay technologies, on-site and off-site response and response strategies, insider threat evaluation, and mathematical methods for evaluating risk due to the threat and the security system design. Students will become familiar with the components of a sustainable nuclear security program and their interconnections, and learn about the planning of nuclear security activities at both the state and facility level.

NSE 526. Numerical Methods for Engineering Analysis. (3 Credits)
Equivalent to: ME 526, NE 526
Recommended: Programming experience and previous exposure to numerical methods

NSE 531. Radiophysics. (3 Credits)
Expands understanding of concepts and applications of atomic and nuclear physics to enable continued study in nuclear engineering and health physics. Includes fundamental concepts of nuclear and atomic physics, atomic and nuclear shell structure, radioactive decay, radiation interactions, radiation biology, and the characteristics of fission.
Equivalent to: MP 531
NSE 533. DETECTION OF SPECIAL NUCLEAR MATERIALS. (3 Credits)
Designed for students interested in radiation measurements and nuclear security, especially those considering PhD-level work in this area. Covers topics including special nuclear material characteristics, radiation background and it interferences with SNM, an introduction to MCNPX, a brief introduction to Geant4, detection of SNM via counting or imaging, localization of SNM; and characterization of SNM.
Prerequisites: NSE 536 with C or better
Recommended: MTH 251 or MTH 251H

NSE 534. APPLIED DETECTION FOR NUCLEAR SECURITY. (3 Credits)
Applied detection techniques currently being deployed globally for nuclear security are presented in lectures and explored in practical exercises. A prominent feature of this class is the unique opportunity to complete the Nuclear Security Education Program (NSEP) Training program hosted at the HAMMER federal training center.
Prerequisites: NSE 536 with C or better

NSE 535. RADIATION SHIELDING AND EXTERNAL DOSIMETRY. (4 Credits)
Theoretical principles of shielding for neutron and gamma radiation; external dosimetry fundamentals for neutrons, photons, and charged particles; applications to problems of practical interest; analytical, numerical, and computer solutions emphasized.
Equivalent to: MP 535, NE 535, RHP 535

NSE 536. ADVANCED RADIATION DETECTION AND MEASUREMENT. (4 Credits)
Principles and mechanisms underlying nuclear radiation detection and measurements; operation of nuclear electronic laboratory instrumentation; application of gas-filled, scintillation and semiconductor laboratory detectors for measurement of alpha, beta, gamma, and neutron radiation, liquid scintillation equipment; use of Bonner spheres for neutron energy profiles; experimental investigation of interactions of radiation with matter. Lec/lab.
Prerequisites: NSE 531 with C or better or NE 531 with C or better or MP 531 with C or better or RHP 531 with C or better or MP 531 with C or better
Equivalent to: MP 536

NSE 537. DIGITAL RADIATION MEASUREMENT AND SPECTROSCOPY. (3 Credits)
Principles of digital spectroscopy; application of digital filters in digital processing of detector pulses; hardware implementation of a typical digital spectrometer; introduction of Field-Programmable Gate Array (FPGA) devices programming a digital spectrometer using Hardware Description Language (VHDL); simulation, synthesis and spectroscopy; experimental design tests and evaluation. Lec/lab.
Prerequisites: NSE 536 with C or better or NE 536 with C or better or RHP 536 with C or better
Equivalent to: NE 537

NSE 539. SELECTED TOPICS IN INTERACTION OF NUCLEAR RADIATION. (1-6 Credits)
Topics associated with interactions of nuclear radiation not covered in other graduate courses; topics may vary from year to year.
Equivalent to: NE 539

NSE 540. NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT. (4 Credits)
Mining, milling, conversion, enrichment, fuel fabrication, reprocessing, and waste management of nuclear fuel, including disposal of low- and high-level radioactive waste.
Equivalent to: NE 540

NSE 541. DIAGNOSTIC IMAGING PHYSICS I. (3 Credits)
An introduction to the production and usage of ionizing radiation in medicine. The course will cover x-ray production, x-ray spectrum, characteristics and manipulation, and how x-rays are utilized to obtain anatomical information in diagnostics imaging. Imaging modalities to be covered in this course are general and portable planar radiography, mammography, and fluoroscopy (including interventional radiography).
Prerequisites: NSE 531 with C or better or MP 531 with C or better or RHP 531 with C or better
Equivalent to: MP 541

NSE 542. DIAGNOSTIC IMAGING PHYSICS II. (3 Credits)
An introduction to Computed Tomography (CT) and Ultrasound (US) imaging, and their applications in medicine. The course will cover x-ray production, detection, and image processing as it relates specifically to CT, as well as general acoustic physics principles and how they are applied to US imaging. Additionally, clinical radiation protection and dosimetry in diagnostic imaging will be taught.
Prerequisites: NSE 531 with C or better or PP 531 with C or better or RHP 531 with C or better
Equivalent to: MP 542

NSE 543. ADVANCED DIAGNOSTIC IMAGING PHYSICS. (3 Credits)
An introduction to the areas of health informatics and magnetic resonance imaging (MRI). The health informatics portion of the course will specifically cover picture archiving and communication systems (PACS), including DICOM standards, data transfer and storage, digital image displays, and clinical implementation of PACS systems. The MRI portion of the course will provide instruction on the physical principles behind nuclear magnetic response (NMR) and how these phenomenon are exploited in MRI. Advanced MRI techniques and applications, along with clinical testing requirements, will also be covered.
Prerequisites: NSE 531 with C or better or MP 531 with C or better or RHP 531 with C or better
Equivalent to: MP 543

NSE 544. NUCLEAR MEDICINE IMAGING. (3 Credits)
An introduction to the uses of radionuclides in medical imaging. The theory and application of detectors and imaging systems in nuclear medicine including collimators, scintillation probes, cameras, SPECT, PET, and hybrid technologies (SPECT/CT, PET/CT, and PET/MRI) will be covered.
Prerequisites: (NSE 541 with C or better or MP 541 with C or better) and (NSE 531 [C] or RHP 531 [C])
Equivalent to: MP 544

NSE 545. DIAGNOSTIC IMAGING PRACTICUM. (3 Credits)
Provides an introduction to the medical physicist’s role in a clinical department; an opportunity to integrate principles learned throughout the graduate program as they apply to diagnostic imaging physics. Observations of procedures in radiography, fluoroscopy, ED, OR, interventional radiology, CT, MRI, ultrasound, and nuclear medicine. Experience in regulatory testing of x-ray equipment; observations of testing of CT and other x-ray modalities. Graded P/N.
Prerequisites: (NSE 541 with C or better or MP 541 with C or better) and (NSE 531 [C] or MP 531 [C] or RHP 531 [C])
Equivalent to: MP 545

NSE 549. SELECTED TOPICS IN NUCLEAR FUEL CYCLE ANALYSIS. (1-6 Credits)
Topics associated with the nuclear fuel cycle not covered in other graduate courses; topics may vary from year to year.
Equivalent to: NE 549
This course is repeatable for 45 credits.
NSE 550. PRINCIPLES OF NUCLEAR MEDICINE. (3 Credits)
Basic principles of nuclear medicine; detectors; radiopharmaceutical; dosimetry; imaging procedures.
Equivalent to: RHP 550

NSE 551. NEUTRONIC ANALYSIS I. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions.
Equivalent to: NE 551

NSE 552. NEUTRONIC ANALYSIS II. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions.
Equivalent to: NE 552

NSE 553. ADVANCED NUCLEAR REACTOR PHYSICS. (3 Credits)
Advanced analytic and numerical techniques for the prediction of the neutron population in nuclear reactor systems. Topic will include long characteristic neutron transport, collision probabilities, nodal methods, equivalence theory, and perturbation theory.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 552 [C] or NE 552 [C])
Equivalent to: NE 553
Recommended: Computer programming experience

NSE 555. REACTOR OPERATOR TRAINING I. (3 Credits)
The Oregon State University TRIGA Reactor Operator I class is one of a two-course series. Student interested in participating in this course are expected to enroll in both the NSE 455/555 and NSE 456/556 classes taught during spring and summer terms. Students successfully completing the NSE 455/555 and NSE 456/556 series will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Equivalent to: NE 555

NSE 556. REACTOR OPERATOR TRAINING II. (4 Credits)
The Oregon State University TRIGA Reactor Operator Training II class is one of a two-course series. Students interested in participating in this course must have already taken and successfully passed NSE 455/555. Students successfully completing NSE 456/556 will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Prerequisites: NSE 555 with C or better or NE 555 with C or better
Equivalent to: NE 556

NSE 557. NUCLEAR REACTOR LABORATORY. (2 Credits)
Experimental investigation of the principles of nuclear reactor operation. Use of the OSU TRIGA Reactor and other laboratory facilities. Preparation and presentation of laboratory reports. Lec/lab.
Prerequisites: (NSE 551 with C or better or NE 550 with C or better) and (NSE 552 [C] or NE 552 [C])
Equivalent to: NE 557

NSE 559. SELECTED TOPICS IN NUCLEAR REACTOR ANALYSIS. (1-3 Credits)
Topics associated with nuclear reactor theory not covered in other graduate courses; topics may vary from year to year.
Equivalent to: NE 559
This course is repeatable for 45 credits.

NSE 561. NUCLEAR REACTOR SYSTEMS LABORATORY. (3 Credits)
Operational aspects of nuclear reactor systems; neutronic and thermal-hydraulic characterization of nuclear reactors; examination of design basis accident prevention and mitigation; loss of coolant accidents; loss of flow accidents; station blackouts. Lec/lab.
Prerequisites: (NSE 553 with C or better or NE 553 with C or better) and (NSE 567 [C] or NE 567 [C])
Equivalent to: NE 561

NSE 562. RADIATION THERAPY. (3 Credits)
The physics of radiation generation and delivery relevant to the field of clinical radiation oncology. Topics will include external beam radiation therapy; dosimetric calculations; high dose-rate and low dose-rate brachytherapy; electron beam dosimetry and treatment planning; special techniques in radiotherapy; and clinical radiation protection and quality assurance.
Prerequisites: NSE 531 with C or better or MP 531 with C or better or NE 531 with C or better or RHP 531 with C or better
Equivalent to: MP 562

NSE 563. APPLIED RADIATION THERAPY PHYSICS LABORATORY I. (3 Credits)
The applied practice of therapeutic radiation physics for clinical radiation oncology. Topics include current methodologies in treatment delivery and planning algorithms, best practices and protocols for quality assurance, special techniques in radiotherapy, and oncology.
Prerequisites: NSE 562 with C or better or MP 562 with C or better
Equivalent to: MP 563

NSE 564. APPLIED RADIATION THERAPY PHYSICS LABORATORY II. (3 Credits)
Covers the applied practice of therapeutic radiation physics for clinical radiation oncology. Topics include current methodologies in SRS and ARC QA, treatment planning QA, adaptive radiotherapy, eye plaque brachytherapy and HDR braytherapy.
Equivalent to: MP 564

NSE 565. APPLIED THERMAL HYDRAULICS. (3 Credits)
Advanced topics in the computational modeling of the hydrodynamic and heat transfer phenomena of nuclear reactors. Steady-state and transient solutions of one-dimensional nuclear reactor thermal hydraulic models. Nuclear reactor behavior analysis during various accident scenarios.
Equivalent to: NE 565

NSE 567. NUCLEAR REACTOR THERMAL HYDRAULICS. (4 Credits)
Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single- and two-phase flow behavior. Advanced thermal hydraulic computer codes.
Equivalent to: NE 567
NSE 568. NUCLEAR REACTOR SAFETY. (3 Credits)
Focused on probability risk assessment and system reliability analysis techniques applied to nuclear reactor safety. Application of these methods will be performed specifically through examination of neutronics and thermal hydraulic transients, effectiveness of emergency systems, accident prevention and mitigation, and assessment of radioactive release to the environment.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 567 [C] or NE 567 [C])
Equivalent to: NE 568

NSE 569. SELECTED TOPICS IN NUCLEAR REACTOR ENGINEERING. (1-6 Credits)
Advanced nuclear engineering design concepts, reactor systems analysis techniques and innovative nuclear engineering applications. Artificial intelligence and expert system applications to nuclear engineering problems. Topics may vary from year to year.
Equivalent to: NE 569
This course is repeatable for 30 credits.

NSE 573. NUCLEAR REACTOR SYSTEMS ANALYSIS. (3 Credits)
Analysis of nuclear light water reactor (pressurized water reactor and boiling water reactor) design and operation, including the nuclear steam supply system, engineered safety features and balance of plant systems; regulatory design requirements; industry standards; plant engineering and instrumentation drawings. Advanced reactor system designs.
Prerequisites: NSE 552 with C or better or NE 552 with C or better
Equivalent to: NE 573

NSE 574. NUCLEAR SYSTEMS DESIGN I. (4 Credits)
Part I of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills.
Equivalent to: RHP 574

NSE 575. NUCLEAR SYSTEMS DESIGN II. (4 Credits)
Part II of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 552 [C] or NE 552 [C]) and (NSE 574 [C] or NE 574 [C])
Equivalent to: RHP 575

NSE 582. APPLIED RADIATION SAFETY. (4 Credits)
Application of radiation protection as practiced in the fields of nuclear science and engineering; application of health physics principles to reduce health hazards at each of the following stages: design, prevention, assessment, and post-incident. A history of key nuclear regulatory agencies; early and current radiation protection standards and organizations responsible for their formulation; major nuclear legislation; pertinent nuclear rules and regulations and their application. Lec/lab.
Equivalent to: MP 582

NSE 583. RADIATION BIOLOGY. (3 Credits)
Biological effects of ionizing radiation at the molecular, cellular, and organismal levels with emphasis on vertebrates; both acute and chronic radiation effects are considered.
Equivalent to: MP 583

NSE 584. RADIATION BIOLOGY II. (3 Credits)
Application of radiobiological models in radiation therapy. Some background in radiation biology is strongly recommended.
Equivalent to: MP 584, RHP 584

NSE 588. RADIOECOLOGY. (3 Credits)
Radionuclides in the environment: their measurement and identification, uptake and transfer through food chains. Effect of radiation on natural populations of plants and animals.
Equivalent to: RHP 588
Recommended: NSE 481 or RHP 481 or NE 481

NSE 590. INTERNAL DOSIMETRY. (3 Credits)
Further development and more in-depth treatment of internal dosimetry concepts, theoretical basis of energy deposition, biokinetics, and estimation of radiation risk from ingested, inhaled, or injected radionuclides.
Prerequisites: NSE 531 with C or better and NSE 535 [C]
Equivalent to: NE 590, RHP 590

NSE 599. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: MP 599
This course is repeatable for 16 credits.

NSE 601. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: MP 601
This course is repeatable for 99 credits.

NSE 603. THESIS. (1-16 Credits)
Equivalent to: MP 603
This course is repeatable for 999 credits.

NSE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: MP 601
This course is repeatable for 16 credits.

NSE 606. PROJECTS. (1-16 Credits)
Equivalent to: MP 606
This course is repeatable for 16 credits.

NSE 607. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: MP 607
This course is repeatable for 16 credits.

NSE 610. INTERNSHIP. (1-16 Credits)
Equivalent to: MP 610
This course is repeatable for 16 credits.

NSE 654. COMPUTATIONAL PARTICLE TRANSPORT. (3 Credits)
Properties and methods for solution of the linear Boltzmann equation for nuclear reactors; spherical and double-spherical harmonics; integral equation methods; Monte Carlo methods.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 552 [C] or NE 552 [C])
Equivalent to: NE 654

NSE 667. ADVANCED THERMAL HYDRAULICS. (3 Credits)
Advanced topics in single- and two-phase hydrodynamics and heat transfer for nuclear reactors. Two-phase flow patterns, flow instabilities, condensation induced transients, convective boiling heat transfer, and current topics in reactor safety thermal hydraulics. Offered alternate years.
Prerequisites: NSE 567 with C or better or NE 567 with C or better
Equivalent to: NE 667
NSE 699. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: NE 699
This course is repeatable for 16 credits.
NSE 808. WORKSHOP. (1-4 Credits)
Equivalent to: NE 808
This course is repeatable for 16 credits.

Medical Physics Graduate Major
(MMP, MS, PhD)

Graduate Areas of Concentration
Medical health physics, therapeutic radiologic physics

Medical physics examines and applies numerous aspects of nuclear science to medicine. Graduates can move to clinical residencies or research jobs which apply physics to medicine in imaging and radiation therapy.

The programs consist of a minimum of 45 credits, 39 of which must be didactic. The following courses are required and the remaining credits can be compiled of any 500- or 600-level course taught in the department or from outside the department if approved by an advisor. A comprehensive oral exam must be passed to complete the degree. MS students, in addition to the exam, must present their work to a committee of graduate faculty.

For more information, please contact:

Dr. Krystina Tack, PhD, DABR
Director
100 Radiation Center
Oregon State University
Corvallis, OR 97331-5902
541-737-2343
541-737-0480 (fax)
tackk@ohsu.edu

Major Code: 3770

Nuclear Engineering Graduate Major
(MENG, MS, PhD)

Graduate Areas of Concentration
Application of nuclear techniques, arms control technology, nuclear instrumentation and applications, nuclear medicine, nuclear power generation, nuclear reactor engineering, nuclear systems design and modeling, nuclear waste management, numerical methods for reactor analysis, radiation shielding, radioisotope production, space nuclear power, thermal hydraulics

The School of Nuclear Science and Engineering offers graduate work leading toward the Master of Engineering, Master of Science, and Doctor of Philosophy degrees in Nuclear Engineering.

The Nuclear Engineering graduate degree is designed to prepare students for careers involved with the many beneficial applications of nuclear energy, radiation, and radioactive materials. Nuclear engineering professions are essential to society’s well-being since they enable significant public benefits through energy security, national defense, medical health, and industrial competitiveness.

Competitive fellowships and research and teaching assistanships are available to incoming graduate students. The U.S. Department of Energy and National Academy for Nuclear Training support a number of fellowship programs each year. We are one of eight participating universities in the U.S. where students may attend graduate school on the Nuclear Engineering, Health Physics, and Applied Health Physics fellowships sponsored by the U.S. Department of Energy. Each year the National Academy for Nuclear Training also supports fellowships for students entering Nuclear Engineering and Radiation Health Physics at OSU.

World-class facilities are available for the instructional and research programs of the school. These are housed in the OSU Radiation Center and include a TRIGA Mark II nuclear reactor, the Advanced Thermal Hydraulic Research Laboratory, the APEX nuclear safety scaled testing facility, and laboratories specially designed to accommodate radiation and the use of radioactive materials.

For more information, contact the School of Nuclear Science & Engineering, NSE.Office@oregonstate.edu, 541-737-2343.

Major Code: 3270

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<tr>
<td>NSE 536</td>
<td>ADVANCED RADIATION DETECTION AND MEASUREMENT</td>
<td>4</td>
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<tr>
<td>NSE 553</td>
<td>ADVANCED NUCLEAR REACTOR PHYSICS</td>
<td>3</td>
</tr>
<tr>
<td>NSE 568</td>
<td>NUCLEAR REACTOR SAFETY</td>
<td>3</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>NSE 507</td>
<td>SEMINAR</td>
<td>maximum 3</td>
</tr>
<tr>
<td>Electives</td>
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**MS**

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<tr>
<th>Code</th>
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<tr>
<td>Core Courses</td>
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<tr>
<td>NSE 535</td>
<td>RADIATION SHIELDING AND EXTERNAL DOSIMETRY</td>
<td>4</td>
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<tr>
<td>NSE 536</td>
<td>ADVANCED RADIATION DETECTION AND MEASUREMENT</td>
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<td>NSE 553</td>
<td>ADVANCED NUCLEAR REACTOR PHYSICS</td>
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<tr>
<td>NSE 568</td>
<td>NUCLEAR REACTOR SAFETY</td>
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<tr>
<td>Seminar</td>
<td></td>
<td>3</td>
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<tr>
<td>NSE 507</td>
<td>SEMINAR</td>
<td>maximum 3</td>
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<td>Electives</td>
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<td>Thesis</td>
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Additional Requirements for M.S. and M.Eng. students without prior coursework in Nuclear Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>NSE 515</td>
<td>NUCLEAR RULES AND REGULATIONS</td>
<td>2</td>
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<tr>
<td>NSE 531</td>
<td>RADIOPHYSICS</td>
<td>3</td>
</tr>
<tr>
<td>NSE 551</td>
<td>NEUTRONIC ANALYSIS I</td>
<td>3</td>
</tr>
<tr>
<td>NSE 552</td>
<td>NEUTRONIC ANALYSIS II</td>
<td>3</td>
</tr>
<tr>
<td>NSE 557</td>
<td>NUCLEAR REACTOR LABORATORY</td>
<td>2</td>
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</table>
The Nuclear Engineering program is designed to prepare students for careers involved with the many beneficial applications of nuclear energy, radiation, and radioactive materials. Nuclear engineering professions are essential to society’s well-being since they enable significant public benefits through energy security, national defense, medical health, and industrial competitiveness.

This undergraduate curricula is designed for students with professional interests in the field of nuclear engineering and technology. This specialized field involves an integrated study of the physical aspects of ionizing and nonionizing radiation, nuclear power and alternative technology development and application, through theoretical and methodologic development.

Competitive scholarships are available to incoming undergraduate students. The U.S. Department of Energy and National Academy for Nuclear Training support a number of scholarship programs each year.

World-class facilities are available for the instructional and research programs of the school. These are housed in the OSU Radiation Center and include a TRIGA Mark II nuclear reactor, the Advanced Thermal Hydraulic Research Laboratory, the APEX nuclear safety scaled testing facility, and laboratories specially designed to accommodate radiation and the use of radioactive materials.

For more information, contact the School of Nuclear Science & Engineering, NSE.Office@oregonstate.edu, 541-737-2343.
Thermal Hydraulic Research Laboratory, the Advanced Nuclear Systems Engineering Laboratory, and laboratories specially designed to accommodate radiation and the use of radioactive materials.

**Minor Code:** 327

Students not majoring in nuclear engineering or radiation health physics may earn a Nuclear Engineering minor, which consists of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>NSE 234</td>
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<tr>
<td>&amp; NSE 235</td>
<td>NUCLEAR AND RADIATION PHYSICS II</td>
<td></td>
</tr>
<tr>
<td>NSE 236</td>
<td>NUCLEAR RADIATION DETECTION AND INSTRUMENTATION</td>
<td>4</td>
</tr>
<tr>
<td>NSE 451</td>
<td>NEUTRONIC ANALYSIS I</td>
<td>3</td>
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<td>NSE 473</td>
<td>NUCLEAR REACTOR SYSTEMS ANALYSIS</td>
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<td>NSE 481</td>
<td>RADIATION PROTECTION</td>
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<td>NSE courses at 300 level or higher</td>
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**Total Hours:** 27

**Minor Code:** 327

**Nuclear Engineering Undergraduate Major (BS, HBS)**

The Bachelor of Science and Honors Bachelor of Science degrees in Nuclear Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

The goals of the nuclear engineering curriculum are to prepare students for careers related to the many beneficial uses of nuclear technology and energy. Nuclear engineers apply engineering principles to the research, design, and operation of a wide variety of nuclear technology applications including power generation, medicine, and radioactive waste management.

**Program Educational Objectives – Nuclear Engineering**

The OSU Nuclear Engineering Program effectively prepares students for careers and professional accomplishments in the nuclear engineering industry through its established Program Educational Objectives.

The Program Educational Objectives for the Nuclear Engineering Program may be found at the following link (https://ne.oregonstate.edu/accreditation/).

**Student Outcomes – Nuclear Engineering**

The OSU Nuclear Engineering Program prepares its graduates to achieve the Program Educational Objectives. This is achieved by ensuring students are able to perform Student Learning Outcomes upon their graduation.

The Student Learning Outcomes for the Nuclear Engineering Program may be found at the following link (https://ne.oregonstate.edu/accreditation/).

**Major Code:** 327

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
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</tr>
<tr>
<td>CH 202</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCourse</td>
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**Second Year**

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**Third Year**

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**Fourth Year**

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<th>Hours</th>
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<tbody>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>NSE 114</td>
<td>INTRO TO NUCLEAR ENGINEERING AND RADIATION</td>
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<tr>
<td>NSE 115</td>
<td>INTRO TO NUCLEAR ENGINEERING AND RADIATION</td>
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</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
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<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
<td>4</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>NSE 451</td>
<td>NEUTRONIC ANALYSIS I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; NSE 452</td>
<td>NEUTRONIC ANALYSIS II</td>
<td></td>
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<tr>
<td>NSE 473</td>
<td>NUCLEAR REACTOR SYSTEMS ANALYSIS</td>
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</tr>
<tr>
<td>NSE 474</td>
<td>NUCLEAR SYSTEMS DESIGN I</td>
<td>4</td>
</tr>
<tr>
<td>NSE 475</td>
<td>NUCLEAR SYSTEMS DESIGN II</td>
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<td>NSE 481</td>
<td>RADIATION PROTECTION</td>
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<tr>
<td>Restricted Electives</td>
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<td>*Synthesis Courses</td>
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<td>Free Elective</td>
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**Total Hours:** 180-181
Radiation Health Physics Graduate Major (MHP, MS, PhD)

Graduate Areas of Concentration

Application of nuclear techniques, boron neutron capture therapy, emergency response planning, environmental monitoring, environmental pathways assessment, nuclear medicine, radiation detection and instrumentation, radiation dosimetry, radiation shielding, radioactive material transport, radioactive waste management, research reactor health physics, risk assessment

Also available via Ecampus.

The School of Nuclear Science and Engineering offers graduate work leading toward the Master of Health Physics, Master of Science, and Doctor of Philosophy degrees in Radiation Health Physics.

The Radiation Health Physics program is designed to prepare students for careers involved with the many beneficial applications of nuclear energy, radiation, and radioactive materials. The Radiation Health Physics profession is essential to society’s well-being since they enable significant public benefits through energy security, national defense, medical health, and industrial competitiveness.

This graduate curricula and research programs are designed for students with professional interests in the field of radiation protection. This specialized field involves an integrated study of the physical aspects of ionizing and nonionizing radiation, their biological effects, and the methods used to protect people and their environment from radiation hazards while still enabling the beneficial uses of radiation and radioactive materials.

Competitive fellowships and research and teaching assistantships are available to incoming graduate students. The U.S. Department of Energy and National Academy for Nuclear Training support a number of fellowship programs each year. Oregon State University is one of eight participating universities in the U.S. where students may attend graduate school on the Nuclear Engineering, Health Physics, and Applied Health Physics fellowships sponsored by the U.S. Department of Energy. Each year the National Academy for Nuclear Training also supports fellowships for students entering nuclear engineering and radiation health physics at OSU. Research and teaching assistant opportunities are also available for students to support the educational and research programs conducted by the department.

World-class facilities are available for the instructional and research programs of the school. These are housed in the OSU Radiation Center and include a TRIGA Mark II nuclear reactor, the Advanced Thermal Hydraulic Research Laboratory, the APEX nuclear safety scaled testing facility, and laboratories specially designed to accommodate radiation and the use of radioactive materials.

For more information, contact the School of Nuclear Science & Engineering, NSE.Office@oregonstate.edu, 541-737-2343.

Major Code: 327

Major Code: 3750

<table>
<thead>
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<th>MS</th>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>NSE 515</td>
<td>NUCLEAR RULES AND REGULATIONS</td>
<td>2</td>
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<tr>
<td>NSE 516</td>
<td>RADIOCHEMISTRY</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>or NSE 519</td>
<td>RADIOCHEMICAL ANALYSIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSE 531</td>
<td>RADIOPHYSICS</td>
<td>3</td>
<td></td>
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<tr>
<td>NSE 535</td>
<td>RADIATION SHIELDING AND EXTERNAL DOSIMETRY</td>
<td>4</td>
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<tr>
<td>NSE 536</td>
<td>ADVANCED RADIATION DETECTION AND MEASUREMENT</td>
<td>4</td>
<td></td>
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<td>NSE 582</td>
<td>APPLIED RADIATION SAFETY</td>
<td>4</td>
<td></td>
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<tr>
<td>NSE 583</td>
<td>RADIATION BIOLOGY</td>
<td>3</td>
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<tr>
<td>NSE 588</td>
<td>RADIOECOLOGY</td>
<td>3</td>
<td></td>
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<td>NSE 590</td>
<td>INTERNAL DOSIMETRY</td>
<td>3</td>
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<tr>
<td>Seminar</td>
<td>NSE 507</td>
<td>SEMINAR</td>
<td>maximum 3</td>
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<tr>
<td>Thesis</td>
<td>NSE 503</td>
<td>THESIS</td>
<td>maximum 6</td>
</tr>
<tr>
<td>Electives</td>
<td>Chosen by student, as approved by major professor</td>
<td>minimum 6</td>
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Total Hours 45

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<tr>
<td>NSE 516</td>
<td>RADIOCHEMISTRY</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>or NSE 519</td>
<td>RADIOCHEMICAL ANALYSIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSE 531</td>
<td>RADIOPHYSICS</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NSE 535</td>
<td>RADIATION SHIELDING AND EXTERNAL DOSIMETRY</td>
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<td></td>
</tr>
<tr>
<td>NSE 536</td>
<td>ADVANCED RADIATION DETECTION AND MEASUREMENT</td>
<td>4</td>
<td></td>
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<tr>
<td>NSE 582</td>
<td>APPLIED RADIATION SAFETY</td>
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<td>NSE 583</td>
<td>RADIATION BIOLOGY</td>
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<td>NSE 588</td>
<td>RADIOECOLOGY</td>
<td>3</td>
<td></td>
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<td>NSE 590</td>
<td>INTERNAL DOSIMETRY</td>
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<tr>
<td>Seminar</td>
<td>NSE 507</td>
<td>SEMINAR</td>
<td>maximum 3</td>
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<td>Electives</td>
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Total Hours 45

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<th>PhD</th>
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<td>NSE 603</td>
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Total Hours 108

1 The MHP degree option provides students the opportunity to pursue advanced-level study without the requirement of completing thesis research. A comprehensive oral exam is taken in lieu of the thesis requirement and course requirements are the same as for the MS degree. These degrees are intended as terminal degrees, not as preparation for a doctorate, and will emphasize job-related knowledge and skills. Although not required, students wishing to pursue a PhD in the future are advised to pursue an MS degree, not the MHP.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Must be selected to satisfy baccalaureate core requirements
2 Approved technical electives from departmental list
Radiation Health Physics Graduate Minor

The Radiation Health Physics program is designed to prepare students for careers involved with the many beneficial applications of nuclear energy, radiation, and radioactive materials. The Radiation Health Physics profession is essential to society’s well-being since they enable significant public benefits through energy security, national defense, medical health, and industrial competitiveness.

This graduate curricula and research programs are designed for students with professional interests in the field of radiation protection. This specialized field involves an integrated study of the physical aspects of ionizing and nonionizing radiation, their biological effects, and the methods used to protect people and their environment from radiation hazards while still enabling the beneficial uses of radiation and radioactive materials.

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For more information, contact the School of Nuclear Science & Engineering, NSE.Office@oregonstate.edu, 541-737-2343.

Minor Code: 3750

Radiation Health Physics Minor

The Radiation Health Physics program is designed to prepare students for careers involved with the many beneficial applications of nuclear energy, radiation, and radioactive materials. The Radiation Health Physics profession is essential to society’s well-being since they enable significant public benefits through energy security, national defense, medical health, and industrial competitiveness.

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World-class facilities are available for the instructional and research programs of the school. These are housed in the OSU Radiation Center and include a TRIGA Mark II nuclear reactor, the Advanced Thermal Hydraulic Research Laboratory, the Advanced Nuclear Systems Engineering Laboratory, and laboratories specially designed to accommodate radiation and the use of radioactive materials.

Minor Code: 326

Students not majoring in radiation health physics or nuclear engineering may earn the Radiation Health Physics minor, which consists of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>NSE 234</td>
<td>NUCLEAR AND RADIATION PHYSICS I</td>
<td>6</td>
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<tr>
<td>NSE 235</td>
<td>and NUCLEAR AND RADIATION PHYSICS II</td>
<td></td>
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<tr>
<td>NSE 236</td>
<td>NUCLEAR RADIATION DETECTION AND INSTRUMENTATION</td>
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<td>NSE 415</td>
<td>NUCLEAR RULES AND REGULATIONS</td>
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<tr>
<td>NSE 435</td>
<td>RADIATION SHIELDING AND EXTERNAL DOSIMETRY</td>
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<td>NSE 481</td>
<td>RADIATION PROTECTION</td>
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</table>

Major Code: 3750

Radiation Health Physics Graduate Minor

The student’s principal direction in the course of study comes from the doctoral committee, in which the major professor has final approval.

In addition, the School of Nuclear Science & Engineering PhD requirements include:

1. Passing a written qualifying examination for candidacy
2. On assignment from the student’s doctoral committee, taking and passing (B average or higher) such courses as judged desirable by the doctoral committee for satisfactory progress in doctoral research
3. Calling regular (every 6 months recommended, but at least annual) meetings of the Doctoral Committee so that the student’s progress can be evaluated and guidance offered
4. Preparing, presenting and defending a written dissertation proposal, i.e., the Preliminary Exam.

The Preliminary Exam should be taken as soon after the qualifying exam as possible.

Major Code: 3750

Radiation Health Physics Minor

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td>NSE 516</td>
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<td>NSE 582</td>
<td>APPLIED RADIATION SAFETY</td>
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<tr>
<td>NSE 583</td>
<td>RADIATION BIOLOGY</td>
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</tr>
<tr>
<td>NSE 588</td>
<td>RADIOECOLOGY</td>
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<tr>
<td>NSE 590</td>
<td>INTERNAL DOSIMETRY</td>
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Total Hours: 15

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<td>NSE 583</td>
<td>RADIATION BIOLOGY</td>
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<td>NSE 588</td>
<td>RADIOECOLOGY</td>
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<td>NSE 590</td>
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Total Hours: 18

Minor Code: 3750
Minor Code: 326

Radiation Health Physics Undergraduate Major (BS, HBS)

The Bachelor of Science and Honors Bachelor of Science degrees in Radiation Health Physics are accredited by the Applied and Natural Science Accreditation Commission (ANSAC) of ABET, http://www.ABET.org.

The goals of the radiation health physics curriculum are to prepare students for careers related to the many beneficial uses of nuclear technology and energy. Radiation health physicists study methods used to protect people and their environment from radiation hazards while enabling the beneficial uses of radiation and radioactive materials.

Program Educational Objectives – Radiation Health Physics

The OSU Radiation Health Physics Program effectively prepares students for careers and professional accomplishments in the radiation health physics industry through its established Program Educational Objectives.

The Student Learning Outcomes for the Radiation Health Physics Program may be found on the school’s website (https://ne.oregonstate.edu/accreditation/).

Major Code: 326

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<tr>
<td>NSE 483</td>
<td>RADIATION BIOLOGY</td>
<td>3</td>
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<tr>
<td>NSE course at 300 level or higher</td>
<td>4</td>
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<td>Total Hours</td>
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Second Year

| BI 211  | *PRINCIPLES OF BIOLOGY                    | 8     |
| BI 212  | *PRINCIPLES OF BIOLOGY                    | 4     |
| HHS 231 | *LIFETIME FITNESS FOR HEALTH              | 2     |
| HHS 241 | *LIFETIME FITNESS (or any PAC course)     | 1-2   |
| NSE 234 | NUCLEAR AND RADIATION PHYSICS I           | 3     |
| NSE 235 | NUCLEAR AND RADIATION PHYSICS II          | 3     |
| NSE 236 | NUCLEAR RADIATION DETECTION AND INSTRUMENTATION | 4     |
| *Perspectives Courses                                 | 3     |
| Select one of the following options:                    | 15    |
| Option A                                              |       |
| PH 201 | *GENERAL PHYSICS                          |       |
| PH 202 | *GENERAL PHYSICS                          |       |
| PH 203 | *GENERAL PHYSICS                          |       |
| Option B                                              |       |
| PH 211 | *GENERAL PHYSICS WITH CALCULUS            |       |
| PH 212 | *GENERAL PHYSICS WITH CALCULUS            |       |
| PH 213 | *GENERAL PHYSICS WITH CALCULUS            |       |
| Free Elective                                        | 3     |

Third Year

| BI 231  | INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY | 3     |
| NSE 319 | *SOCIAL ASPECTS OF NUCLEAR TECHNOLOGY       | 3     |
| NSE 481 | RADIATION PROTECTION                        | 4     |
| Select one of the following options:                    | 6-8   |
| Option A                                              |       |
| ST 201  | PRINCIPLES OF STATISTICS                    |       |
| ST 202  | PRINCIPLES OF STATISTICS (Group B)          |       |
| Option B                                              |       |
| ST 314  | INTRODUCTION TO STATISTICS FOR ENGINEERS    |       |
| Free Elective                                        | 3     |
| Electives (restricted in Health)                      | 3     |
| Free Electives                                       | 3     |
| *Perspectives Courses                                 | 9     |
| Restricted Electives                                  | 10    |

Fourth Year

| H 425   | FOUNDATIONS OF EPIDEMIOLOGY                 | 3     |
| H 445   | OCCUPATIONAL HEALTH                         | 3     |
| NSE 407 | SEMINAR (in Radiation Health Physics - 3 terms) | 3     |
| NSE 415 | NUCLEAR RULES AND REGULATIONS               | 2     |
| NSE 435 | RADIATION SHIELDING AND EXTERNAL DOSIMETRY  | 4     |
| NSE 474 | *NUCLEAR SYSTEMS DESIGN I                  | 4     |
| NSE 475 | *NUCLEAR SYSTEMS DESIGN II                 | 4     |
| NSE 483 | RADIATION BIOLOGY                          | 3     |
| NSE 488 | RADIOECOLOGY                               | 3     |
| Electives (restricted in Health)                      | 9     |
| Free Electives                                       | 8     |
| Restricted Elective                                  | 3     |
| *Synthesis Course                                    | 3     |
Total credits required for graduation is 180

Hours 52

Total Hours 189-192

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Must be selected to satisfy baccalaureate core requirements
2 Approved technical electives from departmental list

Major Code: 326

Radiation Health Physics - Pre Med Option

This option is offered within the following major(s):

- Radiation Health Physics - College of Engineering (p. 504)

Students in Radiation Health Physics can also pursue the Radiation Health Physics-Pre Med option in which they fulfill the requirements for the BS degree in Radiation Health Physics, as well as the course work expected for entrance into most medical schools.

Option Code: 602

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BI 109</td>
<td>HEALTH PROFESSIONS: MEDICAL</td>
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<td>CH 231</td>
<td>GENERAL CHEMISTRY &amp; *LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY &amp; *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
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<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY &amp; *LABORATORY FOR CHEMISTRY 233</td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>CS 101</td>
<td>COMPUTERS: APPLICATIONS AND IMPLICATIONS or INTRODUCTION TO COMPUTER SCIENCE I</td>
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<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>INTEGRAL CALCULUS</td>
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<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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<td>INTRO TO NUCLEAR ENGINEERING AND RADIATION PHYSICS</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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First Year

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<tbody>
<tr>
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Hours 44

Third Year

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Perspectives Course 3

Fourth Year

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Perspectives Course 3

Synthesis Course 3

Total Hours 181-182

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Must be selected to satisfy the requirements of the baccalaureate core.
2 Required for entry into the professional program.

Option Code: 602

College of Forestry

109 Richardson Hall
Oregon State University
Corvallis, OR 97331-5704
Phone: 541-737-2004
Email: forestrystudentservices@oregonstate.edu
Website: http://www.forestry.oregonstate.edu

Administration

Anthony S. Davis, Interim Dean, 541-737-5097, anthony.davis@oregonstate.edu
Jim Johnson, Senior Associate Dean for Outreach and Engagement, 541-737-8954, jim.johnson@oregonstate.edu
Katy Kavanagh, Associate Dean for Research, 541-737-8954, katy.kavanagh@oregonstate.edu
Randall S. Rosenberger, Associate Dean for Student Success, 541-737-4425, r.rosenberger@oregonstate.edu
Nicole Kent, Head Advisor, 541-737-1592, nicole.kent@oregonstate.edu
College of Forestry (CoF)
The College of Forestry at Oregon State University is one of the world's premier education, research, and outreach institutions that focuses on broad areas related to forest resources, terrestrial systems, wood products, ecosystem services, recreation, tourism, and their management.

We provide our graduates with an understanding of the complexity of forests and the economic and social systems that depend upon them; to work with nature to keep land healthy for future generations; to know the science, technology and business associated with managing and using forests and related resources; and to work effectively with others in a culturally diverse, global society.

The OSU College of Forestry has educated students for over 100 years. We offer a breadth of undergraduate and graduate programs that prepare students for a variety of careers in the public and private sectors. Our programs are ranked among the very best in the world. Our world-class faculty and modern facilities, combined with remarkable access to local forests, private industries, public agencies, international travel, and research through paid internships and mentored work experiences, provide our students with necessary knowledge and skills for fulfilling careers.

Degrees and Accreditations
The college offers Bachelor of Science (BS, HBS) degrees in Forest Engineering, Forestry, Natural Resources, Renewable Materials, and Tourism, Recreation & Adventure Leadership; and, in coordination with the College of Engineering, a double degree in Forest-Civil Engineering.

BS degrees in Forestry, Forest Engineering, and Forest Engineering-Civil Engineering are accredited by the Society of American Foresters (SAF). In addition, the BS degree in Forest Engineering and the BS double degree in Forest Engineering-Civil Engineering are accredited by the Engineering Accreditation Commission of ABET (https://www.abet.org/). The BS degree in Renewable Materials is accredited by the Society of Wood Science and Technology (SWST).

Graduate programs in Sustainable Forest Management, Forest Ecosystems and Society, and Wood Science and Engineering include the Master of Forestry (MF), Master of Science (MS), and Doctor of Philosophy (PhD). Each department also participates in the Master of Arts in Interdisciplinary Studies (MAIS). The college also offers an online-only Master of Natural Resources (MNR) and online-only graduate certificates in Sustainable Natural Resources (SNR), Urban Forestry, and Forests & Climate Change.

Double Degrees
Undergraduates with majors in the College of Forestry also can earn secondary degrees in education, innovation management, or sustainability. See the College of Education, College of Business, or College of Agricultural Sciences sections of this catalog for more information.

Minors
The college offers minors in Forestry, Natural Resources, Renewable Materials, and Tourism, Recreation & Adventure Leadership (Bend campus only).

High School Preparation
Students planning to study at Oregon State University should include the following subjects in their high school programs: English, 4 years; mathematics, 3 years; science, 3 years (to include at least one year of each of two different sciences—biology, chemistry, physics, etc.); social studies, 3 years; and foreign language, 2 years.

Transfer Students
Because of the technical and professional nature of the college’s curricula, the college reserves the right to determine whether courses taken at another institution satisfy the college’s curricular requirements. In general, equivalent college-level courses successfully completed at an accredited college or university are accepted. OSU students requesting a transfer to the College of Forestry must be in good academic standing at the university. Please contact the Head Advisor at 541-737-1592 for additional information.

Advising
The College of Forestry is committed to helping students succeed. Students are required to meet with an advisor each term. Advisors are valuable sources of information about degree programs, mentoring, and other special opportunities in line with students’ interests. Personnel in Advising and the Student Resources & Engagement Office are available to help with university rules and regulations, job placement, exchange programs, and referrals to cross-campus programs and services. Students are encouraged to take an active role in their program planning, and to use their time at OSU to develop themselves both academically and professionally.

The college and the OSU Career Development Center provide up-to-date information for both seasonal and permanent work and offer a full array of career services to prepare undergraduates and graduates for jobs.

Education Facilities
Richardson Hall contains modern classroom, laboratory, computer, and study facilities that support learning. COF offers a Self-Learning Center where students have access to educational materials, computers, and group study space. The Wood Innovation Center promotes great relationships between students, employers, and faculty.

Classes use the nearby college forests for field instruction and research projects. In addition to the 11,500 acres in the McDonald-Dunn Forests, the college manages other forests in Oregon for education and research.

The college also makes extensive use of various public and private programs and facilities for student benefit. Numerous field trips to forests, wood processing and manufacturing operations, recreation facilities, and research sites enable students to observe contemporary problems and practices.

Corvallis is one of the largest forestry and wood science research centers in the world. An innovative research program is conducted by the college through its Forest Research Laboratory and by the campus-based Forest Sciences Laboratory of the U.S. Forest Service. These organizations offer state-of-the-art facilities for educational and employment opportunities for superior students.

A Forest Products Collection contains approximately 2,500 species of wood, primarily from North and South America, Southeast Asia, and
Africa, while the grounds around the college are planted with an extensive collection of Pacific Northwest trees and shrubs.

Student Activities
Numerous opportunities exist for students to participate in social and academic activities related to forestry and natural resources, sports logging, and international travel. Clubs and student chapters of several professional societies are active in the college, as well as Xi Sigma Pi, a national honorary society to which College of Forestry students may belong. These clubs offer students the chance to develop leadership and team-building skills.

Scholarships
The College of Forestry offers over $500,000 in undergraduate scholarships annually. Many scholarships are merit based, and awards range from between $1,000 and $9,000 per year. Online applications (http://studentservices.forestry.oregonstate.edu/sre/scholarships/) are available and are due February 15 of each year.

Graduate students are commonly supported with teaching and research assistantships, as well as fellowships with awards totaling over $300,000 per year. More information is available on the College of Forestry website (http://www.forestry.oregonstate.edu/graduate-programs/funding/).

Scholarships and fellowships are awarded each spring for the following academic year.

Academic Requirements
To earn a bachelor of science degree, a student must complete at least 180 quarter credits of university-level courses for the Forestry; Natural Resources; Renewable Materials; and Tourism, Recreation, and Adventure Leadership programs. At least 192 quarter credits of university-level courses are required for the BS in Forest Engineering, and 242 credits are required for the double degree in Forest Engineering and Civil Engineering. These curricula include:

- Written and oral communications, 12–13 credits including a senior writing intensive course.
- OSU Baccalaureate Core curriculum.
- Completion of an approved departmental curriculum.
- Minimum grades:
  - Forestry majors must earn grades of C or better in all courses (or approved substitutions) required for the major and option. No major or option courses may be taken with S/U grading.
  - Forest Engineering majors must earn grades of C or better in all courses (or approved substitutions) required for the major. No major courses may be taken with S/U grading.
  - Forest-Civil Engineering majors must earn grades of C or better in all courses (or approved substitutions) required for the major. No major courses may be taken with S/U grading.
  - Natural Resources majors must achieve passing grades in all major courses, and a minimum GPA of 2.25 in the option. Natural Resources majors can take up to two S/U graded courses in their major or option.
  - Renewable Materials majors must achieve grades of C- or high in all COF courses (prefix: FE, FES, FOR, NR, TRAL, or WSE) for the major or option. No major or option courses may be taken with S/U grading.
  - Tourism, Recreation & Adventure Leadership majors must earn grades of C or high in all COF courses (prefix: FE, FES, FOR, NR, TRAL, or WSE) for the major or option. No major or option courses may be taken with S/U grading.
  - Approved work experience as noted below.

Professional and Personal Requirements
Those majoring in Forest Engineering, Forest Engineering-Civil Engineering, Forestry, Renewable Materials, and Tourism, Recreation & Adventure Leadership must complete six months of satisfactory employment in an area related to their major.

Students are personally responsible for fulfilling all curricular requirements in proper sequence. Work performance and personal conduct are thoroughly appraised by the college. Since the professions of forestry and natural resources are highly regarded for their ethical and academic standards, students are responsible for observing the Professional Code of Conduct of the college in its entirety. Departure from these ethical requirements may result in dismissal from the college.

Forest Ecosystems and Society
The faculty, staff, and students in the Department of Forest Ecosystems and Society are dedicated to the discovery and dissemination of knowledge related to the interactions among landscapes, forests, and people. Humans are dependent on forests in many ways. We seek to understand the diversity of benefits derived from forests and expand our knowledge of how forests function to provide those benefits. We provide the expertise needed by scientists, managers, and the general public as they jointly decide how these values can be sustained in the face of climate change, land use pressures and economic uncertainties. We contribute scientific understanding to decisions that lead to sustaining these important values on forestlands in Oregon, in the U.S., and around the globe now and in the future.

The Department of Forest Ecosystems and Society offers a graduate program in Forest Ecosystems and Society. The program includes Master of Forestry (MF), Master of Science (MS), and Doctor of Philosophy (PhD) degrees. The department also offers an online-only Master of Natural Resources (MNR) degree and online-only graduate certificates in Sustainable Natural Resources; Urban Forestry; and Forests and Climate Change.

Research
Research in the Department of Forest Ecosystems and Society focuses on fundamental and applied research to help solve complex natural resource challenges. We integrate biophysical and social sciences across scales within natural and managed forest ecosystems. Graduate education emphasizes the ability to define and solve researchable problems and function in interdisciplinary terms. Graduate students are encouraged to participate actively in the department's large, diverse program of seminars, continuing education courses and workshops, international research, and other professional and educational activities.

Forest Ecosystems and Society Graduate Degree Programs
The MS and PhD degrees in Forest Ecosystems and Society are structured specifically for those interested in careers in resource management, research, teaching, and specialized areas of forest science, social science, and interdisciplinary science. The degrees are available in seven areas of concentration: forest, wildlife and landscape ecology; genetics and physiology; integrated social and ecological systems; the science of conservation, restoration and sustainable management;
social science, policy, and natural resources; soil-plant-atmosphere continuum; and sustainable recreation and tourism.

The **Master of Forestry degree** is a non-thesis degree that supports advancement in non-research professional forestry and forestry-related professional positions. The degree emphasizes one of two areas: biology or silviculture. Students in either area prepare for careers as professional forest biologists, silviculturists, or other specialists capable of analyzing opportunities for natural resource management for landowners. This degree typically takes 12–15 months to complete and requires the student work on a capstone project.

The **Master of Natural Resources (MNR) degree** is offered as a non-thesis option only. Certificates in Sustainable Natural Resources, Urban Forestry, and Forests and Climate Change are available in association with the MNR program. The MNR curriculum facilitates learning by natural resource professionals who work in settings that require cross-disciplinary competency to find solutions to natural resource problems. The MNR is taught entirely online through OSU Ecampus (although it may be possible for some students to work toward the MNR degree while in residence at OSU).

### Interdisciplinary Graduate Degree Programs

The Department of Forest Ecosystems and Society participates in a number of other interdisciplinary graduate degree programs at OSU, including the Master of Arts in Interdisciplinary Studies (MAIS), Master of Environmental Arts and Humanities, PhD in Molecular and Cellular Biology, Environmental Sciences, Water Resources, and Applied Economics.

### Undergraduate Programs

#### Majors

- **Natural Resources (p. 523)**
  - **Options:**
    - Conservation Law Enforcement (p. 526)
    - Ecological Restoration
    - *Fish and Wildlife Conservation*
    - Forest Ecosystems
    - Human Dimensions in Natural Resources
    - Individualized Specialty Option
    - Integrated Conservation Analysis
    - Landscape Analysis
    - Natural Resource Education (p. 531)
    - Policy and Management
    - Urban Forest Landscapes
    - Wildland Fire Ecology
    - Tourism, Recreation, and Adventure Leadership (p. 534)

- **Forest Ecosystems and Society (p. 519)**
- **Natural Resources (p. 520)**

#### Certificates

- **Forests and Climate Change (p. 520)**
- **Sustainable Natural Resources (p. 533)**
- **Urban Forestry (p. 540)**

#### Troy Hall, Department Head

321 Richardson Hall
Oregon State University
Corvallis, OR 97331-5752
Phone: 541-737-2088
Email: fesdept@oregonstate.edu
Website: http://fes.forestry.oregonstate.edu/

### Faculty

**Professors**

Bondi, T. Hall, Lachenbruch, Law, Oester, Puettmann, K.N. Johnson, R. Johnson, Nelson, Ripple, Rosenberger, Ross, Strauss

**Associate Professors**

Betts, Creighton, Ganio, Grotta, Howe, Lindberg, Needham, Reuter, Still, Withrow-Robinson

**Assistant Professors**

Ahrens, Campbell, D’Antonio, Davis, Hajjar, Krawchuk, Luoma, Munanura, Rivers, Rosenberg, Schmidt, Schulze, Warren

**Senior Instructors**

Anzinger, Bishaw

**Instructors**

Diebel, Gassner, K. Hall, Liegel, Mangla, Olsen, Painter, Perry, Ries, Stemper

### Adjunct Faculty

Bailey, Lach, Lajtha, Walker

### Courtesy/Affiliate Faculty

Alexander, Baur, Bell, Brooks, Castellano, Cazeres-Gonzalez, Charnley, Cohen, Eisenberg, Fettig, Gray, Grimm-Greenblatt, Haag, Kim, Kraft, Kroll, McCulloh, McKane, Meinerz, Morzillo, Murden, Newsome, Perakis, Phillips, Smith, Spies, Swanson, Taylor, Trappe, Vogeler, Woodruff, Zhao

### Forest Ecosystems and Society

**FES 115. ECOLOGY OF OREGON COAST FOREST. (1 Credit)**

A combination of lecture, lab, and field exercises to explore the ecology and development of Oregon coastal forests. Lec/lab. Graded P/N.

**Equivalent to:** FS 115

**FES 199. SPECIAL TOPICS. (1-16 Credits)**

This course is repeatable for 16 credits.

**Equivalent to:** FS 199

**FES 202. SOFTWARE TOOLS IN QUANTITATIVE SOCIAL SCIENCE RESEARCH. (3 Credits)**

Develop and apply software skills to analyze quantitative social science data, then interpret and present results. Using software, students will conduct statistical analysis of primary and/or secondary data (for example, their own survey data or data from sources such as the US Census American Community Survey).

**Prerequisites:** ST 201 with C or better
FES 240. *FOREST BIOLOGY. (4 Credits)
Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: FES 240H, FOR 240
FES 240H. *FOREST BIOLOGY. (4 Credits)
Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course
Equivalent to: FES 240
FES 241. DENDROLOGY. (3 Credits)
Learn to identify the principal forest trees of North America, and the principal trees and shrubs of the Pacific Northwest. Also learn about forested regions of the world. Lec/lab/rec.
Equivalent to: FES 141
FES 242. FOREST PLANTS OF THE PACIFIC NORTHWEST. (3 Credits)
Field course on the identification and ecology of forest trees, shrubs, and herbs of the Pacific Northwest. Overnight camping required. Students should be prepared to hike 3-5 miles per day.
FES 341. FOREST ECOLOGY. (3 Credits)
Basic physiological characteristics of trees, succession, climax, and related concepts. Vegetation classification. Stand structure, diversity, competition, growth, soils-forests interactions, biomass and nutrient distribution, energy relations, nutrient element dynamics, ecology of disturbances.
Equivalent to: FOR 341
FES 342. FOREST TYPES OF THE NORTHWEST. (3 Credits)
Forest trees in nature are aggregated into stable or transitory associations known as forest cover types. Knowledge of forest cover types, their species composition and ecology, is applicable to the fields of forestry, fire management, wildlife management, and forest ecology.
Equivalent to: FOR 342
FES 343. FORESTS OF THE EASTERN UNITED STATES. (3 Credits)
Major Southeast US forest types will be visited and morphological, geographic, ecological and economic characteristics of important forest tree species examined.
Prerequisites: FES 141 with C or better or FES 241 with C or better
This course is repeatable for 3 credits.
FES 350. URBAN FORESTRY. (3 Credits)
Introduction to principles and practices of planting and managing trees as a system of urban environment; understanding the economic, environmental, social aspects of urban forests, and an overview of contemporary land use issues and societal perspectives between people and plants. CROSSLISTED as FES 350/HORT 350.
Equivalent to: FOR 350
Recommended: Foundational forestry and horticulture courses
FES 355. MANAGEMENT FOR MULTIPLE RESOURCE VALUES. (3 Credits)
Management of a variety of resource attributes in multiple use context, including considerations for recreation, fish, wildlife, aesthetics, watersheds, and forest products.
Equivalent to: FOR 355
FES 365. *ISSUES IN NATURAL RESOURCES CONSERVATION. (3 Credits)
Background of major current issues in natural resources conservation with emphasis on forests, soils, and water and potential sustainable carrying capacity. Focus on evaluating facts and opinions related to issues. Basics of terrestrial and aquatic ecology, recent and current issues of soil, water, and forest use and management. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FOR 365
FES 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
FES 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FS 401
This course is repeatable for 16 credits.
FES 403. THESIS. (1-16 Credits)
Equivalent to: FS 403
This course is repeatable for 16 credits.
FES 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FS 405
This course is repeatable for 16 credits.
FES 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
FES 407. SEMINAR. (1-16 Credits)
Some sections graded A-F. This course is repeatable for a maximum of 16 credits.
This course is repeatable for 16 credits.
FES 410. INTERNSHIP. (1-16 Credits)
Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. Graded P/N.
This course is repeatable for 16 credits.
FES 412. FOREST ENTOMOLOGY. (3 Credits)
Role of insects in natural and managed forests. Recognition of important forest insect pest groups and species, prediction of forest insect responses to environmental changes, and management strategies and treatments to protect forest resource values.
Prerequisites: BI 204 with C or better or BI 211 with C or better or BI 211H with C or better or BI 212 with C or better or BI 212H with C or better
FES 422. RESEARCH METHODS IN SOCIAL SCIENCE. (4 Credits)
An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results.
Lec/lab.
Prerequisites: ST 201 with D- or better or ST 351 with D- or better or ST 351H with D- or better
Equivalent to: TOL 422
FES 430. FOREST AS CLASSROOM. (4 Credits)
Investigates instructional methods used to teach K-12 students about natural resources. Reveals how forest exploration can be used as a means to teach others about science, ecology, mathematics, social science, and history. Provides an opportunity for future teachers, naturalists, interpreters, and scientists to improve their teaching and communication skills.
FES 433. PLANNING AGROFORESTRY PROJECTS. (2 Credits)
Helps forestry and other natural resource students understand various agroforestry concepts, systems and technologies and practices worldwide. Lays the groundwork for students to identify different systems, characterize socio-economic conditions and plan sustainable agroforestry systems. Class activities examine how biological, economic, and social factors influence agroforestry farming decisions.
Prerequisites: BOT 341 with D- or better

FES 435. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FES 435H, TOX 435, TOX 435H
Recommended: One quarter each of biology and chemistry

FES 440. WILDFIRE ECOLOGY. (3 Credits)
Fire histories and ecology of major forest, rangeland, and wetland ecosystems. Includes fire interactions with physical and biotic components of ecosystems, role of fire in ecological processes, and utilization in natural resource management.
Equivalent to: FOR 446
Recommended: Junior or senior standing, with coursework in ecology and natural resource management

FES 444. ECOLOGICAL ASPECTS OF PARK MANAGEMENT. (3 Credits)
Ecological principles applied to the management of park recreation uses. The relationship between biological and physical science information and recreation management decisions is explored.
Equivalent to: TOL 444
Recommended: An ecology course and completion or concurrent enrollment in FES 251 or FOR 251

FES 445. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FOR 445, FW 445
Recommended: BI 370 or BI 370H

FES 447. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: FOR 447, HORT 447
Recommended: (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

FES 450X. LARGE CARNIVORES IN ECOLOGY. (1 Credit)
Exploration of interesting effects of large carnivores on other animals and the structure and function of ecosystems. Featured carnivores include gray wolves, grizzly bears, cougars, lions, and others. Investigation of the global conservation status and trends of large carnivores and their prey.

FES 452. BIODIVERSITY CONSERVATION IN MANAGED FORESTS. (3 Credits)
Designed for students in forestry, wildlife, fisheries and related fields. Introduces the concepts of, and approaches to, managing forest stands, landscapes and regions to achieve desired habitat conditions for indicator species and conservation of biological diversity. CROSSLISTED as FES 452/FW 452.
Equivalent to: FS 453, FW 452
Recommended: FES 240 or FES 341 or BI 370

FES 454. MANAGING AT THE WILDLAND-URBAN INTERFACE. (3 Credits)
Course targets fire-prone communities where resource professionals need to work cooperatively with local and federal agencies and citizens to gain acceptance for fire management programs and build joint responsibility for fuel reduction activities.
Equivalent to: FOR 454
Recommended: FOR 111 for non-Ecampus students

FES 455. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FOR 455, HORT 455
Recommended: FES 350 or HORT 350

FES 477. *AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/ NR 477 and FES 577/RNG 577. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FS 477, NR 477
Recommended: Introductory course in biology.

FES 485. *CONSSENSUS AND NATURAL RESOURCES. (3 Credits)
Students will use a working group approach. They will select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to their issue. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FS 485

FES 486. *PUBLIC LANDS POLICY AND MANAGEMENT. (3 Credits)
Examines public lands policy and management in the Western U.S. Overview of historical and current federal land management agency laws, regulations, and policies. Highlights political, legal, economic, ecological, and social context of public land management decisions. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: Sophomore standing

FES 499. SELECTED TOPICS IN FOREST SCIENCE. (0-16 Credits)
In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions, agroforestry, and others. This course is repeatable for 16 credits.
FES 500. MARKET TOOLS FOR MANAGING GREENHOUSE GAS EMISSIONS. (3 Credits) Examines the use of market-based approaches to managing greenhouse gas emissions; the role of forestry and natural resource management in mitigating greenhouse gas emissions; and the design of carbon and offset markets in the context of broader climate change policies. CROSSLISTED as FES 500/MNR 500.
Equivalent to: MTH 111
Recommended: MTH 111

FES 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FS 501
This course is repeatable for 16 credits.

FES 503. THESIS. (1-16 Credits)
Equivalent to: FS 503
This course is repeatable for 999 credits.

FES 505. READING AND CONFERENCE. (1-16 Credits)
Some sections graded P/N.
Equivalent to: FS 505
This course is repeatable for 16 credits.

FES 506. PROJECTS. (1-16 Credits)
Equivalent to: FS 506
This course is repeatable for 16 credits.

FES 507. SEMINAR. (1-16 Credits)
Some sections graded A-F.
Equivalent to: FS 507
This course is repeatable for 16 credits.

FES 508. WORKSHOP. (1-16 Credits)
Equivalent to: FS 508
This course is repeatable for 16 credits.

FES 511. COMMUNITIES AND NATURAL RESOURCES. (5 Credits) Provides students from diverse backgrounds with interdisciplinary, experiential learning exposure to contemporary community and natural resource issues in rural Oregon. Social science concepts are employed to critically appraise current conditions and future prospects for rural, natural resource-dependent communities.
Equivalent to: FS 511
This course is repeatable for 15 credits.

FES 512. FOREST ENTOMOLOGY. (3 Credits) Role of insects in natural and managed forests. Recognition of important forest insect pest groups and species, prediction of forest insect responses to environmental changes, and management strategies and treatments to protect forest resource values.
Recommended: BI 204 or BI 211 or BI 211H or BI 212 or BI 212H or equivalent.

FES 520. POSING RESEARCH QUESTIONS. (3 Credits) Acquaints beginning graduate students in the natural resources to the scientific method and formation of good researchable questions. The course consists of lectures, readings and discussions. Concepts in the course are reinforced and amplified by discipline-specific companion modules. Students prepare and orally present a researchable question in their area of interest that is critiqued by the class and instructors.
Equivalent to: FS 520

FES 521. NATURAL RESOURCE RESEARCH PLANNING. (3 Credits) Research planning and study plan development, investigative procedures, the principles and ethics of natural resource science, principles and practices in scientific communication.
Equivalent to: FS 521

FES 522. RESEARCH METHODS SOCIAL SCIENCE. (4 Credits) An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results. Lec/lab.
Equivalent to: FOR 522, MNR 522
Recommended: ST 201 or ST 351 or ST 351H plus graduate level statistics course

FES 523. QUANTITATIVE ANALYSIS IN SOCIAL SCIENCE. (4 Credits) Application and interpretation of statistical approaches to human dimensions of natural resources, recreation, and other social sciences. Emphasis is on an applied approach focusing on understanding data, selecting appropriate statistics for theoretical and managerial problems, using statistical software for analyses, and interpreting findings.
Recommended: (FES 522 or FOR 522) and ST 511

FES 524. NATURAL RESOURCES DATA ANALYSIS. (4 Credits) Hands-on experience in applied statistical modeling and data analysis for natural resources. Emphasis is on understanding of statistical models and the application and actual implementation of statistical analysis techniques, use of statistical software for analyses (e.g., R), and interpretation of findings. Students analyze data from their own research for final projects.
Prerequisites: ST 511 with B or better and ST 512 [B]

FES 525. INTERDISCIPLINARY APPROACHES TO SOCIO-ECOLOGICAL PROBLEMS. (3 Credits) Inter-, multi- and transdisciplinary approaches to socio-ecological problems, including terminology, assumptions, and analytical frameworks of different scientific fields. How disciplines have been integrated to approach specific case studies. Teams apply concepts, tools, and approaches in a final integrated analysis, resulting in proposed actions or policies.

FES 526. EFFECTIVE COMMUNICATION & PRESENTATION SKILLS FOR SCIENTISTS. (1 Credit) Provides an overview of communication principles and effective scientific communication skills for producing a seminar on proposed research presented to fellow scientists. Students evaluate strengths and weaknesses of communication styles; develop their ability to provide fair, timely feedback; and apply communication principles to evaluate strengths and weaknesses of presentations and proposed research.
This course is repeatable for 3 credits.

FES 527. FOREST CARBON ANALYSIS FOR ASSESSMENTS AND POLICY AGREEMENTS. (3 Credits) Role of forests in mitigating greenhouse gas emissions. International GHG policies and recommendations for monitoring emissions and forest carbon. Measurement, modeling, and projections of forest ecosystem carbon. Evaluation of policies for reducing GHG emissions and increasing forest carbon stores.
Prerequisites: FES 536 with C or better
Recommended: MNR 538 or MNR 550

FES 530. FOREST AS CLASSROOM. (4 Credits) Investigates instructional methods used to teach K-12 students about natural resources. Reveals how forest exploration can be used as a means to teach others about science, ecology, mathematics, social science, and history. Provides an opportunity for future teachers, naturalists, interpreters, and scientists to improve their teaching and communication skills.
FES 533. PLANNING AGROFORESTRY PROJECTS. (2 Credits)
Helps forestry and other natural resource students understand various agroforestry concepts, systems and technologies and practices worldwide. Lays the groundwork for students to identify different systems, characterize socio-economic conditions and plan sustainable agroforestry systems. Class activities examine how biological, economic, and social factors influence agroforestry farming decisions.
Recommended: BOT 341 and/or equivalent course in ecology.

FES 535. GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535.
Equivalent to: BI 535, FS 535, MCB 535, TOX 535
Recommended: One quarter each of biology and chemistry

FES 536. CARBON SEQUESTRATION IN FORESTS. (2 Credits)
Examines processes controlling the sequestration of carbon in the forest system including the forest itself and wood products. Also examines how forests can be managed to sequester carbon as well as the important economic, policy, and other constraints. Lectures, readings, discussion, simulation models, and home work will be used to cover the material.
Recommended: Undergraduate-level biology or ecology.

FES 537. BELOWGROUND ECOSYSTEMS. (3 Credits)
Physical and biological components and their interactions in different soil ecosystems with description and examination of the relationships between producers and decomposers in the soil.
Recommended: Undergraduate biology or ecology courses

FES 538. VALUATION OF NON-MARKET RESOURCES. (3 Credits)
Focuses on the theory and methods for estimating the economic value of non-market resources (e.g. clean air and water, biodiversity, nature-based recreation, etc.). Blends the theory and econometrics of non-market valuation through hands-on applications of methods with real datasets. The valuation of non-market resources is a burgeoning field within applied economics and should continue to grow in both importance and applications.
Recommended: AREC 512 or ECON 512

FES 540. WILDLAND FIRE ECOLOGY. (3 Credits)
Fire histories and ecology of major forest, rangeland, and wetland ecosystems. Includes fire interactions with physical and biotic components of ecosystems, role of fire in ecological processes, and utilization in natural resource management.
Recommended: Coursework in ecology and natural resource management

FES 542. WILDLIFE LANDSCAPE ECOLOGY. (3 Credits)
Explores the interaction between spatial pattern and scale and ecological processes with particular emphasis on biodiversity in forests. The focus is on theory, methods and conservation applications in landscape ecology.
Recommended: Undergraduate courses in ecology and concurrent enrollment in ST 511

FES 543. ADVANCED SILVICULTURE. (3 Credits)
The scientific basis of forest regeneration and silvicultural practices and prescriptions in immature and mature stands. Field trips are required. Lec/lab.
Equivalent to: FS 543
Recommended: FOR 442 and FOR 443

FES 545. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FOR 545, FW 545
Recommended: BI 370 or BI 370H

FES 546. ADVANCED FOREST COMMUNITY ECOLOGY. (4 Credits)
Fundamental concepts of community including disturbance, diversity and succession. Strong emphasis on field skills and data interpretation. Saturday field trip required. Lec/lab.

FES 547. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: HORT 547
Recommended: (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

FES 548. INVASIVE PLANTS: BIOLOGY, ECOLOGY AND MANAGEMENT. (3 Credits)
Concepts of plant physiology, genetics and population dynamics are used to understand how plant invasions occur and some communities continue to exist. Management implications are explored.
Equivalent to: FS 548

FES 550. TROPHIC CASCADES. (2-3 Credits)
Theory and empirical analysis of terrestrial carnivore effects on plants and ecosystems as mediated through herbivores. Emphasis on large carnivores, frequency/strength of trophic cascades, implications for ecosystem function, management, and restoration. Lectures, current literature, discussions, field exercise, term paper, and student presentations. CROSSLISTED as FES 550/FW 550.
Equivalent to: FOR 547, FW 547, FW 550
This course is repeatable for 3 credits.

FES 552. FOREST WILDLIFE HABITAT MANAGEMENT. (4 Credits)
Management of terrestrial vertebrates in forest ecosystems. Effects on silvicultural practices and landscape pattern on habitats and populations. CROSSLISTED as FES 552/FW 552.
Equivalent to: FW 552
Recommended: FOR 341 or equivalent course in ecology.

FES 554. MANAGING AT THE WILDLAND-URBAN INTERFACE. (3 Credits)
Course targets fire-prone communities where resource professionals need to work cooperatively with local and federal agencies and citizens to gain acceptance for fire management programs and build joint responsibility for fuel reduction activities.
Equivalent to: FOR 554
Recommended: FOR 111 for non-Ecampus students

FES 555. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FOR 555, HORT 555
Recommended: FES 350 or HORT 350
FES 558. CONCEPTS OF FOREST RECREATION PLANNING AND
MANAGEMENT. (3 Credits)
Examines research that forms the conceptual basis for tools, techniques, and approaches used in recreation planning and management.
Equivalent to: FOR 558
FES 560. GREEN INFRASTRUCTURE. (4 Credits)
Explores the relationship between the natural and built environments in cities and examines how planning for and managing green infrastructure assets (such as urban tree canopy, watersheds, and natural areas) increases economic health, community livability and ecological resilience in cities.
FES 561. PHYSIOLOGY OF WOODY PLANTS. (3 Credits)
The structure, growth and physiological processes of trees and shrubs.
Equivalent to: FS 561
Recommended: (CH 231 or CH 231H) and (CH 232 or CH 232H) and (CH 233 or CH 233H) and CH 331 and CH 332 and BOT 331
FES 565. URBAN FORESTRY LEADERSHIP. (2 Credits)
Examines the application of leadership theories and principles to the decision-making, policy creation, and effective administration of urban forestry programs in the public, private, and non-profit sectors. Taught via Ecampus only.
FES 577. AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/ NR 477 and FES 577/RNG 577.
Equivalent to: FS 577, NR 577, RNG 577
Recommended: Introductory course in biology.
FES 580. WRITING SCIENTIFIC MANUSCRIPTS. (1 Credit)
Discussion of parts of a scientific manuscript and the submission, review, and publication process. Brief presentations and discussion of examples provided by the instructor and students. Students write their own manuscripts and work in teams to provide feedback on manuscript components.
FES 585. CONSENSUS AND NATURAL RESOURCES. (3 Credits)
Students will use a working group approach. They will select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to their issue.
Equivalent to: FS 585
FES 586. PUBLIC LANDS POLICY AND MANAGEMENT. (3 Credits)
Examines public lands policy and management in the Western U.S. Overview of historical and current federal land management agency laws, regulations, and policies. Highlights political, legal, economic, ecological, and social context of public land management decisions.
FES 599. SELECTED TOPICS IN FOREST SCIENCE. (0-16 Credits)
In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions, agroforestry, and others. This course is repeatable for 16 credits.
FES 600. GLOBAL CHANGE ECOLOGY: IMPACTS, MITIGATION, AND
ADAPTATION. (3 Credits)
An interdisciplinary discourse on what is known about global change and dynamics of the earth system, including principles of climate, influences on ecosystem functioning and connectivity needed to understand responses of the earth system to human activities.
Equivalent to: FS 600
FES 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FS 601
This course is repeatable for 16 credits.
FES 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
FES 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FS 605
This course is repeatable for 16 credits.
FES 606. PROJECTS. (1-16 Credits)
Equivalent to: FS 606
This course is repeatable for 16 credits.
FES 629. TEACHING PRACTICUM IN FOREST SCIENCE. (1 Credit)
Preparation of graduate students in forest science and related disciplines for their first teaching experiences. Using concepts and information introduced in the class, students will develop the curriculum for one credit of college-level instruction (or an equivalent approved by the instructor) in a topic of their choice.
Equivalent to: FS 629
FES 646. FOREST ECOSYSTEMS ANALYSIS AND APPLICATION. (4 Credits)
The structure and function of forests and associated streams in natural and managed landscapes; application of ecosystem analysis to policy management decisions; roles of models; scaling from individual processes to ecosystems, landscapes, and beyond. Required classroom discussions, field trip.
Equivalent to: FS 646
Recommended: College-level ecology/biology, chemistry, and math; familiarity with Excel.
FES 699. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Master of Natural Resources
MNR 500. MARKET TOOLS FOR MANAGING GREENHOUSE GAS
EMISSIONS. (3 Credits)
Examines the use of market-based approaches to managing greenhouse gas emissions; the role of forestry and natural resource management in mitigating greenhouse gas emissions; and the design of carbon and offset markets in the context of broader climate change policies. CROSSLISTED as FES 500/MNR 500.
Equivalent to: FES 500
Recommended: MTH 111
MNR 511. INTRODUCTION TO SUSTAINABLE NATURAL RESOURCES. (3 Credits)
Overview of economic, environmental, social, cultural, ethical, and policy considerations of sustainable natural resource management. International collaborative efforts to address global natural resource issues. Key policy drivers, key stressors, balancing competing interests. Introductory course required for all Master of Natural Resources students; open to other graduate students. Taught via Ecampus only.
Recommended: Undergraduate biology or ecology course
MNR 522. RESEARCH METHODS SOCIAL SCIENCE. (4 Credits)
An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results. Lec/lab.
Equivalent to: FES 522
Recommended: Upper-division or graduate level statistics

MNR 530. TROPICAL FOREST ECOLOGY AND MANAGEMENT: A GLOBAL PERSPECTIVE. (3 Credits)
Study of tropical forest ecology and the common ecological patterns found within tropical forests. The threats and challenges that tropical forests face in the 21st century and the issues of human use and their impacts. Developing strategies for sustainable management and restoration approaches to alleviate pressure on remaining tropical forests. Taught via Ecampus only.

MNR 538. ADAPTING FORESTS TO CLIMATE CHANGE. (3 Credits)
Climate change is expected to have profound effects on forests. Society can respond by managing in forests in ways that can help mitigate climate change or help forests adapt. Nonetheless, changes in climate and forest responses are uncertain, making management and policy decisions difficult and controversial. We will investigate the effects of climate change on forests, focusing on potential forest management and policy responses.

MNR 550. CLIMATE CHANGE IMPACTS ON FOREST ECOSYSTEMS. (3 Credits)
Forest management responses to climate change will rely on understanding the mechanisms of interaction between forests and climate, as well as the capacity to evaluate impacts of future climate scenarios on forests. This course will consider effects of rising CO2 and changing climate at the level of ecophysiological processes, changes in species distribution, changes in disturbance regimes, and ecosystem-level impacts mediated by the water, carbon, and nitrogen cycles. Modeling approaches will include statistically-based bioclimatic envelopes, and dynamic global vegetation models that treat ecosystem processes and changes in biome distribution.
Recommended: Basic ecology course. FCSJ Graduate Certificate students should take SNR 511 in their first term

MNR 560. MASTERS CASE STUDY. (3 Credits)
Capstone project integrating course work, readings, and assignments to address complex natural resource problems of local or regional importance. Taught via Ecampus only. Graded P/N.
Prerequisites: MNR 511 with C or better

MNR 561. MNR CAPSTONE PROJECT. (1-6 Credits)
Students work with their major advisor on the completion of their capstone project at the end of the MNR degree program. Students incorporate knowledge gained from coursework to address a natural resource problem within interconnected ecological, economic and social contexts.
This course is repeatable for 12 credits.
Recommended: MNR 560 or (SNR 511 and SNR 506)

Natural Resources

NR 201. MANAGING NATURAL RESOURCES FOR THE FUTURE. (3 Credits)
Overview of the complexities involved in managing natural resources of the Pacific Northwest. Exposure to major natural resource issues of the region. Development of critical thinking skills useful in seeking solutions.

NR 202. NATURAL RESOURCE PROBLEMS AND SOLUTIONS. (3 Credits)
Exploration of the multiple components (ecological, social, political, ethical) of selected natural resource problems. Uses case studies to illustrate how social and biophysical characteristics of environmental problems influence the methods used to try to solve these problems and their potential for success.
Recommended: NR 201

NR 312. CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES. (3 Credits)
Provides an introduction to critical thinking as it applies to issues and problems in natural resources. Attention is given to formal argument analysis, fallacies of argumentation, and critical scientific and philosophical concepts.
Recommended: Sophomore standing

NR 325. SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS. (3 Credits)
Approaches to disciplinary and interdisciplinary problem analysis in natural resources. Introduces systems thinking and the benefits and limitations of different tools used to integrate information from multiple disciplines and stakeholders. Applications of alternative analysis tools are illustrated through selected forest-related case studies. Lec/lab.
Prerequisites: MTH 111 with C- or better or Math Placement - ALEKS with a score of 060
Recommended: NR 201 and (ST 201 or ST 351)

NR 351. WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT. (3 Credits)
Role of science in solving natural resource problems. Selecting the 'best available science.' How science is portrayed, filtered, and used by the media and interest groups to affect policy and management. Analysis of case studies on use of science in natural resource decision making.
(Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Sophomore standing and NR 312

NR 380. NATURE IN STORYTELLING OVER THE CENTURIES. (3 Credits)
Examines the historic tendency across cultures to mythologize elements of the natural world, resulting in celebrated myths, fables, and stories. The course examines nature-based folklore from past centuries, uncovering early perceptions of landscapes, creatures, and plants held by societies and cultures. Focus then shifts to exploration of how elements of the natural world have been portrayed in contemporary film, television, and advertising, revealing how perceptions of nature have evolved over the past century. Connections between contemporary popular culture and old-world myths, fables, and stories will thus be revealed.

NR 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

NR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

NR 405. READING AND CONFERENCE. (1-9 Credits)
This course is repeatable for 18 credits.

NR 406. PROJECTS. (1-9 Credits)
This course is repeatable for 16 credits.

NR 407. SEMINAR. (1-9 Credits)
This course is repeatable for 18 credits.

NR 410. INTERNSHIP. (1-6 Credits)
This course is repeatable for 12 credits.
NR 455. NATURAL RESOURCE DECISION MAKING. (4 Credits)
Students will participate on collaborative planning teams that effectively engage stakeholders in the decision making process, and offer sound natural resource decisions that are supported by multiple interests.
Prerequisites: FES 485 with D- or better and [BI 371 [D-] or BI 373 [D-] or ENSC 479 [D-] or FE 460 [D-] or FES 486 [D-] or FOR 460 [D-] or FW 435 [D-] or FW 439 [D-] or FW 454 [D-] or FW 497 [D-] or GEOG 323 [D-] or HORT 318 [D-] or SOIL 395 [D-] or WR 462 [D-])

NR 477. *AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/ NR 477 and FES 577/RNG 577. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FES 477, FS 477, RNG 477
Recommended: Introductory course in biology.

NR 499. SPECIAL TOPICS. (1-16 Credits)
This is a hybrid course when offered by Ecampus.
Equivalent to: NR 499H
This course is repeatable for 16 credits.

NR 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: NR 499
This course is repeatable for 16 credits.

**Sustainable Natural Resources**

SNR 506. INDEPENDENT PROJECT IN NATURAL RESOURCE SUSTAINABILITY. (2 Credits)
Students identify, pose, frame, and analyze the various components of an important natural resource sustainability problem within their country, region, or organization and, at the end of term, present a workplan for its resolution. Oral and written reports are expected. Graded P/N.
Prerequisites: SNR 511 with C or better

SNR 511. SUSTAINABLE NATURAL RESOURCE DEVELOPMENT. (1 Credit)
Using readings, class discussions, and field trips, we introduce the program sessions and pedagogical methods, familiarize students with basic working definitions of sustainability, and build capacity to work as group on a common project.

SNR 520. SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES. (3 Credits)
Using readings, personal experiences, and class discussions, students explore five principles of socially sustainable natural resource management, and review the role they play in creating natural resource-based sustainable communities.
Recommended: SNR 511 and at least two years’ experience working in a natural resources-related field

SNR 521. ECONOMICS OF SUSTAINABLE NATURAL RESOURCE MANAGEMENT. (3 Credits)
Focuses on the sources of market failure, the means of correcting market failure, and the real-world examples of making progress toward sustainable use by means of market mechanisms.
Recommended: SNR 511 and at least two years’ experience working in a natural resources-related field

SNR 522. BASIC BELIEFS AND ETHICS IN NATURAL RESOURCES. (3 Credits)
Examines basic philosophies and ethical systems in American forestry, including Pinchot’s agricultural/utilitarian approach and Leopold’s biotic/ecological model, compares them to contemporary public attitudes and considers their implications for sustainability.

SNR 530. ECOLOGICAL PRINCIPLES OF SUSTAINABLE NATURAL RESOURCES. (3 Credits)
Focus an ecological sustainability and ecological concepts and principles, with examples drawn from forests and arid lands. Exploration of global ecosystems, ecological processes and services, factors that create and maintain diversity, ecosystem health and integrity. Principles for sustainable natural resource management and use.
Recommended: SNR 511 and at least two years’ experience working in a natural resources-related field. Basic ecology course highly recommended.

SNR 531. SUSTAINABLE SILVICULTURE AND FOREST CERTIFICATION. (3 Credits)
Strategies for sustainable silviculture, and measuring and verifying environmental performance (including certification systems) are examined using classroom lectures, case studies, and field exercises. Part of the 18-credit Sustainable Natural Resources (SNR) Graduate Certificate; also open to other graduate students.
Recommended: SNR 511 and at least two years’ experience working in a natural resources-related field

SNR 532. PLANNING AGROFORESTRY PROJECTS. (2 Credits)
Develop basic understanding and appreciation of agroforestry concepts, systems, technologies and practices as used and applied in tropical and temperate zones of the world.
Recommended: SNR 530 (or equivalent ecology course) and SNR 511

SNR 533. NONTIMBER FOREST PRODUCTS: AN INTERDISCIPLINARY INTRODUCTION. (3 Credits)
Interdisciplinary introduction to the culture, history, economy, ecology, policy and management of nontimber forest products (NTFP), e.g., wild foods, medicines, floral greens, craft material and landscaping species. Includes domestic public and private forest and international case studies.

SNR 534. REDUCED IMPACT TIMBER HARVEST. (2 Credits)
Explores planning, implementation, monitoring, and evaluation of reduced impact timber harvesting. Part of the 18-credit Sustainable Natural Resources (SNR) Graduate Certificate; also open to other graduate students.
Recommended: SNR 511 and at least two years’ experience working in a natural resources-related field

SNR 535. SUSTAINABLE MANAGEMENT OF AQUATIC AND RIPARIAN RESOURCES. (3 Credits)
Explores integrated strategies for sustainable management of watersheds, estuaries, coastal zones, and aquatic resources. Special emphasis given to links between land uses and aquatic environments. Part of the 18-credit Sustainable Natural Resources (SNR) Graduate Certificate; also open to other graduate students.
Recommended: SNR 511 and at least two years’ experience working in a natural resources-related field
SNR 540. GLOBAL ENVIRONMENTAL CHANGE. (3 Credits)
Explore biophysical and social sciences that underlie contemporary global change issues: global biogeochemical cycles, climate system, climate change, threats to biodiversity, human dimensions of climate change, globalization, land cover and land use change, global environmental governance and management tools.
Recommended: At least two years’ working in a natural resources-related field. Basic biology course highly recommended

SNR 808. WORKSHOP. (1-4 Credits)
Describes the policies, practices, and market mechanisms that enhance ecological, economic, and social sustainability of natural resource production and natural ecosystems. Sustainable natural resource management attempts to meet the needs of the present without compromising the future of people or the ecosystems on which they depend.
This course is repeatable for 4 credits.

Tourism and Outdoor Leadership

TRAL 110. INTRODUCTION TO WHITE WATER KAYAKING. (2 Credits)
Students will learn fundamentals of white water kayaking in sheltered & moving water based on the internationally recognized British Canoe (BC) and American Canoe Association (ACA) teaching and skills certification systems. Emphasis is on activity and basic skills.

TRAL 111. INTRODUCTION TO CANOEING. (2 Credits)
Students will learn fundamentals of canoeing in sheltered & moving water based on the internationally recognized British Canoe (BC) and American Canoe Association (ACA) teaching and skills certification systems. Emphasis is on activity and basic skills.

TRAL 115. OUTDOOR LIVING SKILLS. (2 Credits)
Edicates and introduces students on how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. Classroom and field (lab) experience. Includes one mandatory weekend overnight outing. CROSSLISTED as PAC 115/TRAL 115.
Corequisites: TRAL 118
Equivalent to: PAC 115
This course is repeatable for 4 credits.

TRAL 118. LABORATORY FOR OUTDOOR LIVING SKILLS. (1 Credit)
Practical field application of concepts learned in PAC 115/TRAL 115, Outdoor Living Skills. Field (lab) experience includes one mandatory weekend overnight. Introduces how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. CROSSLISTED as PAC 118/TRAL 118.
Corequisites: TRAL 115
Equivalent to: PAC 118
This course is repeatable for 2 credits.

TRAL 130. INTRODUCTION TO OUTDOOR AND ADVENTURE PROFESSIONS. (3 Credits)
Outdoor and adventure professions will be explored. Introduces students to practical and conceptual aspects of land and water trips in outdoor tourism, adventure, and educational settings. Innovative people and products will be examined in the context of outdoor and adventure professions and their impact; past, present, and future.
Equivalent to: TOL 130

TRAL 132. *FOUNDATIONS AND HISTORY OF OUTDOOR AND ADVENTURE PROFESSIONS. (3 Credits)
History, evolution, and theoretical underpinning of outdoor and adventure professions as an important and evolving feature of Western culture within the United States and beyond. Influential ideas, paradigm shifts, events, and developments that have led to professionalism, institutionalization, dissemination, and impact on other subject areas and professions. Impact of other cultures on current state of the professions. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: TOL 132

TRAL 173. INTERMEDIATE ROCK CLIMBING. (2 Credits)
Introduces variety of basic skills, gear and systems that will allow them to safely participate in a single pitch rock climbing environment based on internationally recognized American Mountain Guides Association (AMGA) teaching and skills certification systems. Presents students with various technical skills that will serve as a foundation for future land-based outdoor disciplines. Students will be introduced to gear, such as software (ropes, webbing, harnesses) and hardware (carabiners, friction devices); skills, such as knots, belaying, rappelling, lead climbing; and systems such as anchors and basic rescue techniques. CROSSLISTED as PAC 173/TRAL 173.
Equivalent to: PAC 173
This course is repeatable for 10 credits.

TRAL 215. GROUP FACILITATION. (4 Credits)
Introduces facilitation, leadership, and management of groups. Group facilitation theory, techniques, and models for use in a variety of environments and with different populations. Prominent personality types and how to effectively facilitate these. Determining needs, utilizing appropriate techniques, sequencing, and processing to meet specific determined needs of groups.

TRAL 217. INTERMEDIATE ROCK. (2 Credits)
Begins by affirming rock site management foundational skills such as proper equipment, knots, belay techniques, rappelling, and basic climbing anchor systems. Then focuses on building upon those foundational skills by covering more complex anchor systems, belay techniques, vertical rescues, releasable rappels, and movement through various rock specific terrains.
Recommended: TRAL 172 or similar training and equivalent skill level

TRAL 218. ROCK SITE MANAGEMENT. (2 Credits)
Begins by affirming Intermediate Rock foundational skills such as proper equipment, knots, belay & lead climbing techniques, movement, rappelling, and basic climbing anchor systems based on internationally recognized American Mountain Guides Association (AMGA) teaching and skills certification systems. Class will then focus on building upon those foundational skills by covering more complex anchor systems, belay techniques, vertical rescues, releasable rappels and movement through various rock specific terrains.
Prerequisites: TRAL 173 with C or better or PAC 173 with C or better

TRAL 251. RECREATION RESOURCE MANAGEMENT. (4 Credits)
Overview of recreation resource management including study of land and water resources used for outdoor recreation. The planning and management of natural and cultural resources for long-term resource productivity, with a focus on rural and wildlife areas of the forest, range and coast.
Equivalent to: FES 251
**TRAL 260. INTERMEDIATE PADDLESPORT. (2 Credits)**
Learn how to successfully paddle as a competent group member within moving water & whitewater environments up to class III. This course will emphasize that the student has a holistic approach to river running, can be an effective group member during river rescues, can contribute to the safety, group skills and leadership of a river descent and showcase the knowledge required of an intermediate whitewater paddler based on internationally recognized British Canoe (BC) and American Canoe Association (ACA) teaching and skills certification systems. Uses a variety of diverse whitewater specific kayaks and canoes.

**Prerequisites:** (TRAL 110 with C or better or PAC 110 with C or better) and (TRAL 111 [C] or PAC 111 [C])

**TRAL 270. PRE-INTERNSHIP SEMINAR. (1 Credit)**
Exploration of career goals, internship opportunities, and the variety of practice areas in the tourism, recreation, and adventure leadership (TRAL) professions. Student preparation in planning, obtaining, and completing TRAL internships. The course is designed to assist undergraduate majors in TRAL prepare for the required internship. Graded P/N.

**Equivalent to:** TOL 270

**TRAL 280. OUTDOOR LEADERSHIP FUNDAMENTALS. (3 Credits)**
A week-long outdoor expedition focusing on water-based and land-based skills while developing a comprehensive understanding of expedition behavior. Students will meet in the classroom to prepare for the week-long field expedition covering various topics such as risk management, expedition planning, navigation, water safety and other topics. The expedition will expose students to extended travel in the backcountry while further developing technical and interpersonal skills.

**Prerequisites:** (TRAL 110 with C or better or PAC 110 with C or better) and (TRAL 111 [C] or PAC 111 [C]) and TRAL 115 [C] and TRAL 118 [C] and TRAL 173 [C]

**TRAL 299. SPECIAL TOPICS. (0-16 Credits)**
Topics of current importance in tourism, recreation, and/or adventure leadership education. Topics will change from term to term. May be repeated with different topics for credit.

*This course is repeatable for 16 credits.*

**TRAL 309. CERTIFICATION PRACTICUM. (2 Credits)**
Allows students the opportunity to acquire nationally or internationally recognized certification in one or more disciplines. Will provide an avenue for students to acquire professional faculty guidance and mentoring so they are more able to attain a certification.

*This course is repeatable for 6 credits.*

**TRAL 351. OUTDOOR RECREATION MANAGEMENT ON PUBLIC LANDS. (3 Credits)**
Explores current issues and problems in outdoor recreation management on public lands and approaches to address these. Emphasis on day-to-day, field-based management of recreation resources, rather than broad-scale planning.

**Prerequisites:** TRAL 251 with C- or better or FES 251 with C- or better

**Equivalent to:** FES 351

**TRAL 352. WILDERNESS MANAGEMENT. (3 Credits)**
Wilderness as land use concept. Wilderness history, preservation, planning and management. Wilderness in the context of other land uses.

**Equivalent to:** FES 352

**TRAL 353. NATURE, ECO, AND ADVENTURE TOURISM. (3 Credits)**
Introduces students to natural resource-based tourism issues in both domestic and international contexts. Explores distinctions between nature, eco, and adventure tourism and other forms of tourism, positive and negative impacts, and contemporary issues such as accreditation/certification, and sustainable design.

**Equivalent to:** FES 353

**TRAL 354. COMMUNITIES, NATURAL AREAS, AND SUSTAINABLE TOURISM. (3 Credits)**
Introduces students to macro-level community and regional issues associated with tourism in natural areas. Explores positive and negative community impacts associated with tourism, traditional government-based tourism management and policies; community-based tourism management, and partnerships and stakeholder collaboration. Domestic and international examples are used to illustrate concepts and principles.

**Equivalent to:** FES 354

**TRAL 357. *PARKS AND PROTECTED AREAS MANAGEMENT. (3 Credits)**
Provides a broad yet comprehensive understanding of the theories, problems, and techniques of managing parks, wild and scenic rivers, wilderness, and other protected areas. Covers the evolution of policies and recent issues in management of these protected areas, in the United States and around the world. (Bacc Core Course)

**Attributes:** CSGI – Core, Synth, Global Issues

**Equivalent to:** FES 357

**TRAL 370. DESIGN AND MANAGEMENT OF OUTDOOR EXPERIENCES. (4 Credits)**
Introduction to pedagogical, administrative, and organizational knowledge, skills, and dispositions for effective design and management of effective short and extended duration outdoor experiences in wilderness-like areas. Covers personnel logistics, site planning, itinerary planning, educational and skills progression, communication with volunteers and program contacts, budgets.

**Prerequisites:** TRAL 280 with C or better or TOL 375 with C or better

**Equivalent to:** TOL 370

**Recommended:** Junior standing

**TRAL 372. ETHICS AND ADVENTURE LEADERSHIP. (3 Credits)**
Examines ethical issues and situations inherent in adventure leadership and other experiential education settings. Leading adventure programs entails judgment-laden decisions that are made every hour of every day concerning participants, leaders, and programs. Students will become familiar with predominant ethical theories and apply these theories to practical situations with a view to assessing the values that influence their decisions and subsequent actions. Students will better understand how their decisions influence their professional work and those of others within the context of adventure leadership.

**Equivalent to:** TOL 372

**Recommended:** TOL 375 or TRAL 375 or other writing intensive course

**TRAL 373. WILDERNESS AND ADVENTURE EDUCATION. (4 Credits)**
Rationale for and methods used in the application of wilderness and outdoor adventure education programs in education, recreation, corporate and human service settings. Covers historical and contemporary philosophies and practices in adventure education, with a primary emphasis on outdoor adventure education. Explores the educational, social, and ethical consequences of outdoor adventure education programs. Also explores the role of wilderness in the context of the United States and differing views of what constitutes wilderness from an international perspective.

**Equivalent to:** TOL 373

**Recommended:** TRAL 375 or TOL 375
TRAL 374. OUTDOOR ADVENTURE EDUCATION. (3 Credits)
Rationale for and methods used in the application of outdoor adventure education programs in education, recreation, corporate and human service settings. Historical and contemporary philosophies and practices in outdoor adventure education. Explores the educational, social, and ethical consequences of outdoor adventure education programs. Examines outdoor adventure education in the context of the United States and differing paradigms informing the practice in other cultures internationally. Presents current research in outdoor adventure education.
Equivalent to: TOL 401
This course is repeatable for 16 credits.
Recommended: FES 251 and FES 351 and FES 356 and FOR 391 and FOR 407
TRAL 432. ECONOMICS OF RECREATION AND TOURISM. (3 Credits)
Applications of economic theory, concepts, and methods to outdoor recreation and nature-based tourism resources, projects and plans. Key topics include analyses of economic impacts, benefits and costs, demand and supply, and non-market valuation (e.g., revealed, stated, and benefit transfer methods).
Equivalent to: FES 432
Recommended: (AEC 350, ECON 201 or 201H) and (ST 202 or 202H)
TRAL 456. PLANNING FOR SUSTAINABLE RECREATION. (4 Credits)
Concepts related to the creation and design of outdoor recreation plans. Techniques for collecting data pertaining to visitor experiences and preferences. Recreation planning at several levels, both for public and private lands, with emphasis on larger scale site planning where recreation is integrated with other resource uses.
Equivalent to: FES 456
TRAL 457. PLANNING FOR SUSTAINABLE TOURISM. (4 Credits)
Examines relationships among tourists, tourism developments, and the planning of tourist attractions and services. Focuses on planning tourist resources and programs within a geographic region, as well as at both the destination and site levels. Planning tools and design concepts are reviewed, analyzed, and applied. Lec/lab.
Equivalent to: FES 457
TRAL 474. ENTREPRENEURSHIP IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP. (3 Credits)
Creation and management of tourism and outdoor leadership businesses. Covers principles of running a successful business and includes special considerations for operations on public lands (e.g., concessionaires).
Equivalent to: TOL 474
Recommended: BA 101
TRAL 476. RISK MANAGEMENT IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP. (3 Credits)
Risk management in tourism and outdoor leadership from an operational perspective. Focuses on risk in tourism and outdoor education programs as a contributing factor for learning, growth, and satisfaction of client motivations. Covers the nature of accidents in outdoor settings, addresses the practitioner's perspective of risk in the field, and describes theories and methods of implementing risk management. Covers the ethics of utilizing risk and potentially dangerous activities as a basis for enhancing client education and experience.
Equivalent to: TOL 476
TRAL 477. ADVENTURE THERAPY. (3 Credits)
Provides students with an overview of adventure therapy, including its history, theory, current status and future trends. Includes program design, ethical issues, and best practices in the field.
Equivalent to: TOL 477
TRAL 478. LEGAL ISSUES IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP. (3 Credits)
Covers the legal dimensions of tourism and outdoor leadership activities. Students will learn about the civil and criminal judicial system from a tourism and outdoor leadership perspective. They will learn to apply risk management methodologies and instruments, such as contracts, insurance, waivers and releases to address legal liability. The basic principles of intentional and negligent torts will be discussed, with an emphasis on practical applications. Also covers employment issues and general business law, including business structure and the use of entities as liability shields.
Prerequisites: TRAL 375 with C- or better or TOL 375 with C- or better
Equivalent to: TOL 478
TRAL 479. *NATURE AND THE HUMAN EXPERIENCE. (3 Credits)
Examines the human experience with (and within) nature from biological, psychological, spiritual, and international/cultural perspectives. Identifies opportunities for fostering the human-nature connection to achieve organizational goals and individual and societal health. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: TOL 479
Recommended: TOL 375 or other equivalent WIC course.
TRAL 493. ENVIRONMENTAL INTERPRETATION. (4 Credits)
Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers.
Equivalent to: FES 493
TRAL 499. SPECIAL TOPICS. (1-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. Section 8: Social aspects of natural resource management (3 credits) graded.
Equivalent to: TOL 499
This course is repeatable for 16 credits.
TRAL 593. ENVIRONMENTAL INTERPRETATION. (4 Credits)
Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers.
Equivalent to: FES 593

Forest Ecosystems and Society Graduate Major (MF, MS, PhD)

Graduate Areas of Concentration

Forest biology; forest, wildlife and landscape ecology; genetics and physiology; integrated social and ecological systems; silviculture; science of conservation, restoration and sustainable management; social science, policy, and natural resources; soil-plant-atmosphere continuum; sustainable recreation and tourism

This graduate program combines a strong social science faculty with a strong biological and ecological science faculty and so provides a rare opportunity to focus on the interface of social science and ecological science. The FES graduate program provides specific disciplinary opportunities in both ecological and social sciences in natural resource settings and also strives to develop interdisciplinary skills and knowledge. Our program objective is to develop interdisciplinary thinkers, highly capable scientists, and natural resource leaders who are prepared to solve complex socio-ecological problems. The students will be able to identify and contribute to collaborative science-based solutions in ecology and natural resources-related social science.

Master of Forestry (MF) in Forest Ecosystems—Areas of Concentration

1. Forest Biology. Management of natural resources is an increasingly complex and technical undertaking. In some cases, breadth or depth of specialization beyond the BS degree is required or is highly desirable in entry-level professional forestry positions or for advancement in non-research professional forestry positions. The MF in Forest Biology program emphasizes graduate course work in one of five areas of emphasis in forest biology, with supporting work in another area. The program can be completed in 12 months, but it may be extended in accordance with personal needs and the policies of the OSU Graduate School.

2. Silviculture. The MF in Silviculture program provides graduate-level preparation in the full range of disciplines essential for analyzing opportunities, solving problems, and making decisions in silviculture and forest resource management. Graduates from this program must demonstrate competence in the preparation of well-documented silvicultural prescriptions and in the supervision of prescription implementation. The program also provides the background for sustained career development in forest resource management.

Master of Science (MS) and Doctor of Philosophy (PHD) in Forest Ecosystems and Society—Areas of concentration

MS and PhD students may focus their work in one of these areas of concentration or a hybrid of them: forest, wildlife and landscape ecology; genetics and physiology; integrated social and ecological systems; science of conservation, restoration and sustainable management; social science, policy, and natural resources; soil-plant-atmosphere continuum; sustainable recreation and tourism

1. Forest, Wildlife and Landscape Ecology. The many dimensions of biodiversity are the focus of this area of concentration. Species and communities of species, act, react and interact at many spatial and temporal scales. These dynamics take place in an environment that can change gradually or quite rapidly and that can have a large impact on dynamics through direct and indirect effects on species and interspecific relationships.

2. Genetics and Physiology. This concentration explores the genetic and physiological mechanisms, from the scale of molecules and tissues to whole organisms, populations, and species, that determine how plants grow, reproduce, respond to the environment, and are managed and modified for human benefit.

3. Integrated Social and Ecological Systems. Many issues in the broad natural resources arena are truly interdisciplinary across the biophysical and the social sciences. This area of concentration focuses on the integration of these sciences in developing basic concepts and in resolving management issues.

4. Science of Conservation, Restoration and Sustainable Management. The bases for these applied sciences are found in the more basic biophysical and social sciences but their application to these complex goals generates new scientific challenges. This area of concentration seeks to develop these new scientific understandings.
5. Social Science, Policy, and Natural Resources. This concentration involves exploration of social aspects, human dimensions, and policy aspects of natural resource issues by examining linkages among humans, society, and the natural resources on which humans and society depend.

6. Soil-Plant-Atmosphere Continuum. The movement of energy and matter within and among ecosystems controls how these systems function and the services they provide. This area of concentration investigates the mechanisms controlling ecosystem behavior over a range of levels from the whole-plant to the globe.

7. Sustainable Recreation and Tourism. This concentration explores social and/or ecological topics in sustainable recreation and tourism including recreation and tourism behavior; social and ecological impacts; and planning, management, and policy.

For more information, contact the head of the department or any faculty member.

Major Code: 1100

All graduate students are required to take FES 520 usually in their first year and FES 525 usually in their second year.

In addition to FES 520 and FES 525, graduate students are required to take FES 526. M.S. students are expected to enroll in this 1-credit course for two terms during their course of study. Ph.D students must enroll for three terms, and M.F. students must enroll for one term.

Students will work with their major professor / advisor and advisory committee to select additional courses specific to their area of interest in order to meet the minimum number of credits required for their degree program.

Major Code: 1100

Forests and Climate Change Graduate Certificate

This certificate is delivered primarily by Ecampus though some courses may also be offered on the Corvallis campus.

Forests worldwide have begun to be impacted by global climate change, and over the coming century, they will be profoundly altered by it. The adaptation of managed forests to climate change may require both silvicultural and genetics-based options. Because forests have the capacity to both emit and sequester carbon dioxide, a leading greenhouse gas contributing to climate change, there is tremendous interest in managing forests for the mitigation of climate change. These considerations suggest that a good understanding of the relationship between forests and climate change will be a critical requirement for the sustainable management of forest resources. The Forests and Climate Change (FCC) graduate certificate is designed to provide a thorough grounding in methods for assessing the impacts of climate change on forests, the evaluation of proposed adaptation strategies, and the development of management practices to enhance forest carbon sequestration for the mitigation of climate change.

The Forests and Climate Change graduate certificate is appropriate for many students, especially mid-career, company, industry or agency employees who want more training and experience in natural resources management and climate change.

Certificate Code: CG15

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FES 500/MNR 500</td>
<td>MARKET TOOLS FOR MANAGING GREENHOUSE GAS EMISSIONS</td>
<td>3</td>
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<tr>
<td>FES 536</td>
<td>CARBON SEQUESTRATION IN FORESTS</td>
<td>2</td>
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<tr>
<td>MNR 538</td>
<td>ADAPTING FORESTS TO CLIMATE CHANGE</td>
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<td>MNR 550</td>
<td>CLIMATE CHANGE IMPACTS ON FOREST ECOSYSTEMS</td>
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<td>SNR 506</td>
<td>INDEPENDENT PROJECT IN NATURAL RESOURCE SUSTAINABILITY</td>
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<td>FES 527</td>
<td>FOREST CARBON ANALYSIS FOR ASSESSMENTS AND POLICY AGREEMENTS</td>
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<td>SUSTAINABLE NATURAL RESOURCE DEVELOPMENT</td>
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<td>SNR 530</td>
<td>ECOLOGICAL PRINCIPLES OF SUSTAINABLE NATURAL RESOURCES</td>
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<tr>
<td>SNR 540</td>
<td>GLOBAL ENVIRONMENTAL CHANGE</td>
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Total Hours: 19

1 Additional elective courses will be considered in consultation with the FCC Program Director Badege Bishaw

Natural Resources Graduate Major (MNR)

Graduate Areas of Concentration

Fisheries management, forests and climate change, geographic information science (GIScience), sustainable natural resources, urban forestry, water conflict management, and wildlife management

Also available via Ecampus.

The MNR is a 45-credit online degree program with curriculum organized into three sections: core (18 credits), area of emphasis (18 credits), and capstone project (9 credits). It is taught entirely online through OSU Ecampus, although some students work toward the MNR degree while in-residence at OSU.

The MNR degree is offered as a non-thesis program with a capstone project, rather than a thesis. The MNR's contemporary content is for natural resource professionals who work in settings that require cross-disciplinary competency to find solutions to natural resource problems. Integration of multiple disciplines occurs through the curriculum, assignments, and a capstone project. All MNR students integrate concepts and approaches developed throughout the entire program in a final capstone project.

Major Code: 2430

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<th>Code</th>
<th>Title</th>
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<td>Core Courses</td>
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<td>18 credits are required from four thematic areas. These must be courses that are not already being used to satisfy units in the area of emphasis</td>
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<tr>
<td>Theme: Overview/Introduction</td>
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<td>MNR 511</td>
<td>INTRODUCTION TO SUSTAINABLE NATURAL RESOURCES</td>
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<tr>
<td>Theme: Ecology/Production</td>
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<tr>
<td>Select 6 credits from the following:</td>
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<tr>
<td>BEE 511</td>
<td>GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS</td>
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FES 535/TOX 535/ MCB 535 GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
FES 536 CARBON SEQUESTRATION IN FORESTS
FES 545/FW 545 ECOLOGICAL RESTORATION
FES 547/HORT 547 ARBORICULTURE
FES 548 INVASIVE PLANTS: BIOLOGY, ECOLOGY AND MANAGEMENT
FES 552/FW 552 FOREST WILDLIFE HABITAT MANAGEMENT
FES 560 GREEN INFRASTRUCTURE
FW 519 THE NATURAL HISTORY OF WHALES AND WHALING
FW 521 AQUATIC BIOLOGICAL INVASIONS
FW 527 PRINCIPLES OF WILDLIFE DISEASES
FW 535 WILDLIFE IN AGRICULTURAL ECOSYSTEMS
FW 538 STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT LAB
FW 540 VERTEBRATE POPULATION DYNAMICS
FW 551 AVIAN CONSERVATION AND MANAGEMENT
FW 554 FISHERY BIOLOGY
FW 556 FRESHWATER ECOLGY AND CONSERVATION
FW 558 MAMMAL CONSERVATION AND MANAGEMENT
FW 562 ECOYSTEM SERVICES
FW 563 CONSERVATION BIOLOGY OF WILDLIFE
FW 570 ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN
FW 575 WILDLIFE BEHAVIOR
FW 576 FISH PHYSIOLOGY
FW 579 WETLANDS AND RIPARIAN ECOLOGY
FW 580 STREAM ECOLOGY
FW 581 WILDLIFE ECOLGY
FW 583 SPECIES RECOVERY PLANNING AND RESTORATION
FW 597 AQUACULTURE
MNR 530 TROPICAL FOREST ECOLOGY AND MANAGEMENT: A GLOBAL PERSPECTIVE
MNR 538 ADAPTING FORESTS TO CLIMATE CHANGE
MNR 550 CLIMATE CHANGE IMPACTS ON FOREST ECOSYSTEMS
SNR 530 ECOLOGICAL PRINCIPLES OF SUSTAINABLE NATURAL RESOURCES
SNR 531 SUSTAINABLE SILVICULTURE AND FOREST CERTIFICATION
SNR 532 PLANNING AGROFORESTRY PROJECTS
SNR 533 NONTIMBER FOREST PRODUCTS: AN INTERDISCIPLINARY INTRODUCTION
SNR 534 REDUCED IMPACT TIMBER HARVEST
SNR 535 SUSTAINABLE MANAGEMENT OF AQUATIC AND RIPARIAN RESOURCES
SNR 540 GLOBAL ENVIRONMENTAL CHANGE

Theme: Human Systems

Select 6 credits from at least 2 of the 5 areas below:

Economics
AEC 534 ENVIRONMENTAL AND RESOURCE ECONOMICS
FES 500/MNR 500 MARKET TOOLS FOR MANAGING GREENHOUSE GAS EMISSIONS
FW 537 STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT
SNR 521 ECONOMICS OF SUSTAINABLE NATURAL RESOURCE MANAGEMENT

Policy
AEC 532 ENVIRONMENTAL LAW
FES 555/HORT 555 URBAN FOREST PLANNING, POLICY AND MANAGEMENT
FES 565 URBAN FORESTRY LEADERSHIP
FW 515 FISHERIES AND WILDLIFE LAW AND POLICY
FW 522 INTRODUCTION TO OCEAN LAW
FW 620 ECOLOGICAL POLICY

GEDG 540 WATER RESOURCES MANAGEMENT IN THE UNITED STATES
GEDG 541 THE WORLD'S WATER
GEDG 552 SUSTAINABLE SITE PLANNING
PPOL 546 THE POLICY AND LAW OF UNITED STATES COASTAL GOVERNANCE
PS 575 ENVIRONMENTAL POLITICS AND POLICY
PS 577 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
PS 578 RENEWABLE ENERGY POLICY
WRR 521 WATER CONFLICT MANAGEMENT AND TRANSFORMATION

Sociology
ANTH 581 NATURAL RESOURCES AND COMMUNITY VALUES
FES 585 CONSENSUS AND NATURAL RESOURCES
SOC 554 LEISURE AND CULTURE
SOC 580 ENVIRONMENTAL SOCIOLOGY
SOC 581 SOCIETY AND NATURAL RESOURCES
SOIL 511 SOIL: A NATURAL AND SOCIETAL RESOURCE
SNR 520 SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES

Ethics
FW 549 HISTORY OF FISHERIES SCIENCE
GEDG 564 GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS
PHL 540 ENVIRONMENTAL ETHICS
PHL 543/REL 543 WORLD VIEWS AND ENVIRONMENTAL VALUES
SNR 522 BASIC BELIEFS AND ETHICS IN NATURAL RESOURCES

Communication
COMM 550 COMMUNICATION AND THE PRACTICE OF SCIENCE
FW 514 PROFESSIONAL DEVELOPMENT: MEETING COMMUNICATIONS
LEAD 542 LEADERSHIP SKILLS FOR CAREER SUCCESS
LEAD 543 LEADERSHIP THROUGH CONVERSATIONS
SED 535 COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES
TRAL 593 ENVIRONMENTAL INTERPRETATION

Theme: Methodology

Select 3 credits from the following:

3
BOT 540 FIELD METHODS IN PLANT ECOLOGY
CH 590 COMPUTER PROGRAMMING FOR SCIENTISTS
FW 524 INTRODUCTION TO FISHERIES ASSESSMENT
GEDG 560 GISCIENCE I: INTRODUCTION TO GEOPHYSICAL INFORMATION SCIENCE
GEDG 561 GISCIENCE II: ANALYSIS AND APPLICATIONS
GEDG 580 REMOTE SENSING I: PRINCIPLES AND APPLICATIONS
MNR 522/FES 522 RESEARCH METHODS SOCIAL SCIENCE
PPOL 521 UNDERSTANDING SOCIAL RESEARCH
PPOL 523 QUALITATIVE RESEARCH METHODS
ST 516 FOUNDATIONS OF DATA ANALYTICS
ST 517 DATA ANALYTICS I
ST 539 SURVEY METHODS

Area of Emphasis

Students may select a certificate listed below or design their own option. A certificate may not be used to satisfy core requirements:

Geographic Information Science (GIScience)
Sustainable Natural Resources (SNR)
Water Conflict Management and Transformation (WCMT)
Fisheries Management
Urban Forestry
Forests and Climate Change
Wildlife Management

Design own option (no certificate)

Capstone Project
Master of Natural Resources students will choose one option below depending upon their area of emphasis choice. All students should choose option 1 unless they have completed SNR 511 and SNR 506 as part of their certificate program. Students are advised not to take MNR 560 (or SNR 506) and MNR 561 during the same term. MNR 561 credits should be taken after MNR 560, and the credits may be broken up over more than one term.

Select one of the following options:

**Option 1**
- MNR 560  MASTER'S CASE STUDY
- MNR 561  MNR CAPSTONE PROJECT

**Option 2**
- SNR 511  SUSTAINABLE NATURAL RESOURCE DEVELOPMENT
- SNR 506  INDEPENDENT PROJECT IN NATURAL RESOURCE SUSTAINABILITY
- MNR 561  MNR CAPSTONE PROJECT

**Total Hours:** 45

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**Natural Resources Minor**

Also available at OSU-Cascades and via Ecampus.

Students majoring in other programs at OSU can choose to complete the Natural Resources minor. The minor is intended to provide a broad exposure to the natural resources field. It offers course work that integrates a number of natural resource disciplines.

**Minor Code:** 643

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR 201</td>
<td>MANAGING NATURAL RESOURCES FOR THE FUTURE</td>
<td>3</td>
</tr>
<tr>
<td>FES 485</td>
<td>*CONSSENSUS AND NATURAL RESOURCES</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three courses from the following: 9-11

- FOR 111  INTRODUCTION TO FORESTRY
- FW 251   PRINCIPLES OF FISH AND WILDLIFE CONSERVATION
- NR 202  NATURAL RESOURCE PROBLEMS AND SOLUTIONS
- RNG 121  *INTRODUCTION TO WILDLAND ECOLOGY
- RNG 341  RANGELAND ECOLOGY AND MANAGEMENT
- SUS 102  *INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY

Select two courses from any of the following focus areas of the Resource Management Group: 6-9

- FES 445/FW 445  ECOLOGICAL RESTORATION

---

**Code Title**

- FW 462  ECOSYSTEM SERVICES
- GEOG 250  *LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES
- GEOG 450  LAND USE IN THE AMERICAN WEST
- GEOG 451  PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES
- GEOG 452  SUSTAINABLE SITE PLANNING
- NR 325  SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS
- RNG 421  WILDLAND RESTORATION AND ECOLOGY
- RNG 490  RANGELAND MANAGEMENT PLANNING
- SUS 204  *SUSTAINABILITY ASSESSMENT
- SUS 350  *SUSTAINABLE COMMUNITIES
- TRAL 456  PLANNING FOR SUSTAINABLE RECREATION
- TRAL 457  PLANNING FOR SUSTAINABLE TOURISM
**Natural Resources Undergraduate Major (BS, HBS)**

Also available at OSU-Cascades and via Ecampus.

Troy Hall, Director  
Terina McLachlain, Program Manager  
408 Snell Hall  
Oregon State University  
Corvallis, OR 97331-5703  
Phone: 541-207-3580  
Email: naturalresources@oregonstate.edu  
Website: http://nr.forestry.oregonstate.edu/

This program is an interdisciplinary offering of the colleges of Agricultural Sciences, Forestry, Liberal Arts, and Science but is administered within Forestry.

Students who graduate with a BS degree in Natural Resources from OSU should be able to integrate technical field or laboratory skills with analytical skills to solve critical natural resource problems. The curriculum is designed to help students acquire knowledge about a range of natural resource issues, work in interdisciplinary teams, and deal with social and political aspects of resource management.

Students acquire knowledge in biophysical and social sciences, math, and statistics. They will learn holistic resource management approaches that emphasize the interconnectedness of humans and the environment. In addition, students will develop a toolbox of resource management skills such as communication, collaboration, analysis, assessment, and planning. They explore conservation and management of key resources which include fish and wildlife, land and water resources, and a wide range of ecosystems from forests to rangelands. Students develop disciplinary depth in a focused area through a required specialty option, choosing from a number of pre-approved options, or creating an individualized (student designed) specialty option.

The Natural Resources major is also available at the OSU-Cascades campus in Bend and through the OSU Ecampus program. The Natural Resources major is an interdisciplinary program administered by the College of Forestry.

**Major Code: 671**

Only two courses used to complete the Natural Resources major requirements may be taken S/U.

The Natural Resources Specialty option requires a minimum GPA of 2.25.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FES 485</td>
<td>*Consensus and Natural Resources</td>
<td>3</td>
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<tr>
<td>NR 201</td>
<td>Managing Natural Resources for the Future</td>
<td>3</td>
</tr>
<tr>
<td>NR 455</td>
<td>Natural Resource Decision Making</td>
<td>4</td>
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</tbody>
</table>

**Advanced Communication (3-4 credits)**

Select one course from the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>COMM 321</td>
<td>INTRODUCTION TO COMMUNICATION THEORY</td>
</tr>
<tr>
<td>COMM 322</td>
<td>SMALL-GROUP PROBLEM SOLVING</td>
</tr>
<tr>
<td>COMM 324</td>
<td>COMMUNICATION IN ORGANIZATIONS</td>
</tr>
<tr>
<td>COMM 326</td>
<td>INTERCULTURAL COMMUNICATION</td>
</tr>
<tr>
<td>COMM 328</td>
<td>NONVERBAL COMMUNICATION</td>
</tr>
<tr>
<td>COMM 385</td>
<td>COMMUNICATION AND CULTURE IN CYBERSPACE</td>
</tr>
<tr>
<td>COMM 440</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
</tr>
</tbody>
</table>

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**Minor Code: 643**

* Baccalaureate Core Course (BCC)  
^ Writing Intensive Course (WIC)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>COMM 442</td>
<td>BARGAINING AND NEGOTIATION PROCESSES</td>
</tr>
<tr>
<td>FES 430</td>
<td>FOREST AS CLASSROOM</td>
</tr>
<tr>
<td>FW 489</td>
<td>EFFECTIVE COMMUNICATIONS IN FISHERIES AND WILDLIFE SCIENCE</td>
</tr>
<tr>
<td>NR 312</td>
<td>CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES</td>
</tr>
<tr>
<td>TRAL 493</td>
<td>ENVIRONMENTAL INTERPRETATION</td>
</tr>
<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
</tr>
<tr>
<td>WR 362</td>
<td>*SCIENCE WRITING</td>
</tr>
<tr>
<td>WR 462</td>
<td>*ENVIRONMENTAL WRITING</td>
</tr>
<tr>
<td>WR 466</td>
<td>PROFESSIONAL WRITING</td>
</tr>
<tr>
<td>BI 101</td>
<td>*ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE and *ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE and *HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE</td>
</tr>
<tr>
<td>BI 102</td>
<td></td>
</tr>
<tr>
<td>BI 103</td>
<td></td>
</tr>
<tr>
<td>BI 204</td>
<td>*INTRODUCTORY BIOLOGY I</td>
</tr>
<tr>
<td>BI 205</td>
<td>and *INTRODUCTORY BIOLOGY II</td>
</tr>
<tr>
<td>BI 206</td>
<td>and *INTRODUCTORY BIOLOGY III</td>
</tr>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>BI 212</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>BI 213</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
</tr>
<tr>
<td>CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>ATS 201</td>
<td>*CLIMATE SCIENCE</td>
</tr>
<tr>
<td>FW 345</td>
<td>*GLOBAL CHANGE BIOLOGY</td>
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<tr>
<td>GEOG 323</td>
<td>*CLIMATOLOGY</td>
</tr>
<tr>
<td>SUS 103</td>
<td>*INTRODUCTION TO CLIMATE CHANGE</td>
</tr>
<tr>
<td>CSS 205</td>
<td>*SOIL SCIENCE</td>
</tr>
<tr>
<td>CSS 305</td>
<td>PRINCIPLES OF SOIL SCIENCE</td>
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<tr>
<td>GEO 101</td>
<td>*THE SOLID EARTH</td>
</tr>
<tr>
<td>GEO 201</td>
<td>*PHYSICAL GEOLOGY</td>
</tr>
<tr>
<td>GEO 202</td>
<td>*EARTH SYSTEMS SCIENCE</td>
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<tr>
<td>GEO 221</td>
<td>*ENVIRONMENTAL GEOLOGY</td>
</tr>
<tr>
<td>GEOG 102</td>
<td>*PHYSICAL GEOGRAPHY</td>
</tr>
<tr>
<td>SOIL 205</td>
<td>SOIL SCIENCE</td>
</tr>
<tr>
<td>FOR 206</td>
<td>and *FOREST SOILS LABORATORY FOR SOIL 205 (or SOIL 206)</td>
</tr>
<tr>
<td>BI 351</td>
<td>MARINE ECOLOGY</td>
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<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
</tr>
<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
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<tr>
<td>FES 341</td>
<td>FOREST ECOLOGY</td>
</tr>
<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
</tr>
<tr>
<td>MTH 245</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
</tr>
</tbody>
</table>

Select one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
</tr>
</tbody>
</table>

Resource Management (23–33 credits)

Select one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>FW 412</td>
<td>FOREST ENTOMOLOGY</td>
</tr>
<tr>
<td>FW 312</td>
<td>SYSTEMATICS OF BIRDS</td>
</tr>
<tr>
<td>FW 316</td>
<td>SYSTEMATICS OF FISHES</td>
</tr>
<tr>
<td>FW 318</td>
<td>SYSTEMATICS OF MAMMALS</td>
</tr>
<tr>
<td>Z 365</td>
<td>BIOLOGY OF INSECTS</td>
</tr>
<tr>
<td>Z 477</td>
<td>AQUATIC ENTOMOLOGY</td>
</tr>
</tbody>
</table>

Environmental Assessment and Planning (3–4 credits)

Select one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
</tr>
<tr>
<td>FW 462</td>
<td>ECOSYSTEM SERVICES</td>
</tr>
<tr>
<td>GEOG 250</td>
<td>*LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES</td>
</tr>
<tr>
<td>GEOG 450</td>
<td>LAND USE IN THE AMERICAN WEST</td>
</tr>
<tr>
<td>GEOG 451</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
</tr>
<tr>
<td>GEOG 452</td>
<td>SUSTAINABLE SITE PLANNING</td>
</tr>
<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
</tr>
<tr>
<td>RNG 490</td>
<td>RANGELAND MANAGEMENT PLANNING</td>
</tr>
<tr>
<td>SUS 304</td>
<td>*SUSTAINABILITY ASSESSMENT</td>
</tr>
<tr>
<td>SUS 350</td>
<td>*SUSTAINABLE COMMUNITIES</td>
</tr>
<tr>
<td>TRAL 456</td>
<td>PLANNING FOR SUSTAINABLE RECREATION</td>
</tr>
<tr>
<td>TRAL 457</td>
<td>PLANNING FOR SUSTAINABLE TOURISM</td>
</tr>
<tr>
<td>NR 325</td>
<td>SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS</td>
</tr>
</tbody>
</table>

Fisheries and Marine Sciences (3–4 credits)

Select one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 150</td>
<td>INTRODUCTION TO MARINE BIOLOGY</td>
</tr>
<tr>
<td>BI 347</td>
<td>*OCEANS IN PERIL</td>
</tr>
<tr>
<td>BI 351</td>
<td>MARINE ECOLOGY</td>
</tr>
<tr>
<td>FW 302</td>
<td>BIOLOGY AND CONSERVATION OF MARINE MAMMALS</td>
</tr>
<tr>
<td>FW 320</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
</tr>
<tr>
<td>FW 323</td>
<td>MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST</td>
</tr>
<tr>
<td>FW 426</td>
<td>COASTAL ECOLOGY AND RESOURCE MANAGEMENT</td>
</tr>
<tr>
<td>FW 454</td>
<td>*FISHERY BIOLOGY</td>
</tr>
<tr>
<td>FW 465</td>
<td>MARINE FISHERIES</td>
</tr>
<tr>
<td>FW 473</td>
<td>FISH ECOLOGY</td>
</tr>
<tr>
<td>FW 481</td>
<td>WILDLIFE ECOLOGY</td>
</tr>
<tr>
<td>OC 201</td>
<td>*OCEANOGRAPHY</td>
</tr>
<tr>
<td>OC 332</td>
<td>COASTAL OCEANOGRAPHY</td>
</tr>
</tbody>
</table>

Forestry (3–4 credits)

Select one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE 456/FOR 456</td>
<td>*INTERNATIONAL FORESTRY</td>
</tr>
<tr>
<td>FES 240</td>
<td>*FOREST BIOLOGY</td>
</tr>
<tr>
<td>FES 341</td>
<td>FOREST ECOLOGY</td>
</tr>
<tr>
<td>FES 342</td>
<td>FOREST TYPES OF THE NORTHWEST</td>
</tr>
<tr>
<td>FES 350/HORT 350</td>
<td>URBAN FORESTRY</td>
</tr>
<tr>
<td>FES 440</td>
<td>WILDLAND FIRE ECOLOGY</td>
</tr>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
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<tr>
<td>FES 452/FW 452</td>
<td>BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
</tr>
<tr>
<td>FES 477/NR 477</td>
<td>*AGROFORESTRY</td>
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<tr>
<td>FOR 346</td>
<td>TOPICS IN WILDLAND FIRE</td>
</tr>
<tr>
<td>FOR 441</td>
<td>SILVICULTURE PRINCIPLES</td>
</tr>
</tbody>
</table>

Land and Water (3–5 credits)

Select one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE 430</td>
<td>WATERSHED PROCESSES</td>
</tr>
</tbody>
</table>
Conservation Law Enforcement Option

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

Students will be prepared to enter careers in conservation law enforcement with an understanding of the criminal justice system, environmental law and policy, human dimensions and sustainable resource management.

Option Code: 787

A minimum of 40 credits is required with at least 20 upper-division credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Option Requirements</td>
<td></td>
</tr>
</tbody>
</table>

Measurements (2-3 credits)

Select one course from the following:

- FW 255 FIELD SAMPLING OF FISH AND WILDLIFE
- FW 326/VMB 328 WILDLIFE CAPTURE AND IMMOBILIZATION

Foundational Courses (16 credits)

- COMM 318 ADVANCED INTERPERSONAL COMMUNICATION
- COMM 326 INTERCULTURAL COMMUNICATION
- FW 251 PRINCIPLES OF FISH AND WILDLIFE CONSERVATION
- SOC 241 INTRODUCTION TO CRIME AND JUSTICE
- TRAL 251 RECREATION RESOURCE MANAGEMENT
- WR 327 *TECHNICAL WRITING
- WR 362 *SCIENCE WRITING

Resource Management (6-9 credits)

Select two courses from the following:

- FES 452/FW 452 BIODIVERSITY CONSERVATION IN MANAGED FORESTS
- FW 426 COASTAL ECOLOGY AND RESOURCE MANAGEMENT
- FW 451 AVIAN CONSERVATION AND MANAGEMENT
- FW 458 MAMMAL CONSERVATION AND MANAGEMENT
- RNG 341 RANGELAND ECOLOGY AND MANAGEMENT

Human Dimensions (3-4 credits)

Select one course from the following:

- FW 340 *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES
- FW 439 *HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT
- HDFS 201 *CONTEMPORARY FAMILIES IN THE U.S.
- HDFS 444 FAMILY VIOLENCE AND NEGLECT
- PSY 360 SOCIAL PSYCHOLOGY
- SOC 312 *SOCIOLOGY OF THE FAMILY
- SOC 381 SOCIAL DIMENSIONS OF SUSTAINABILITY
- SOC 441 CRIMINOLOGY AND PENODY
- SOC 448 LAW AND SOCIETY
- SUS 420 SOCIAL DIMENSIONS OF SUSTAINABILITY

Fisheries, Wildlife, and Environmental Law (2-4 credits)

Select one course from the following:

- AEC 253 *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS
- AEC 432 ENVIRONMENTAL LAW
- FOR 462 NATURAL RESOURCE POLICY AND LAW
- FW 341 FISH AND WILDLIFE LAW ENFORCEMENT
- FW 415 FISHERIES AND WILDLIFE LAW AND POLICY
- FW 422 INTRODUCTION TO OCEAN LAW

Electives 2

Total Hours 40-47

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Students will choose a minimum of 11 credits of appropriate course work approved by an advisor from related fields such as criminal justice, fish and wildlife, forestry, recreation, anthropology, sociology, psychology, and natural resources.

Option Code: 663

Ecological Restoration Option

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Also available via Ecampus.

This option will help students understand complexities associated with restoration of terrestrial and aquatic ecosystems, and how restoration decisions involve significant interactions between ecological and social systems.

Option Code: 663

Minimum of 40 credits is required with at least 20 upper-division credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Measurements</td>
<td></td>
</tr>
</tbody>
</table>

Select one course from the following:

- BI 375 FIELD METHODS IN ECOLOGICAL RESTORATION
- BOT 440 FIELD METHODS IN PLANT ECOLOGY
- NR 325 SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS
- RNG 444 RANGELAND ANALYSIS
**Ecological Restoration Foundations**

Select 22–24 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>BOT 321</td>
<td>PLANT SYSTEMATICS</td>
</tr>
<tr>
<td>or BOT 341</td>
<td>PLANT ECOLOGY</td>
</tr>
<tr>
<td>CH 122</td>
<td>GENERAL CHEMISTRY</td>
</tr>
<tr>
<td>or CH 232</td>
<td>GENERAL CHEMISTRY</td>
</tr>
<tr>
<td>&amp; CH 262</td>
<td>and LABORATORY FOR CHEMISTRY 232</td>
</tr>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
</tr>
<tr>
<td>FW 479</td>
<td>WETLANDS AND RIPARIAN ECOLOGY</td>
</tr>
<tr>
<td>or RNG 455</td>
<td>RIPARIAN ECOHYDROLOGY AND MANAGEMENT</td>
</tr>
<tr>
<td>GEOG 450</td>
<td>LAND USE IN THE AMERICAN WEST</td>
</tr>
<tr>
<td>or GEOG 451</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
</tr>
<tr>
<td>SOIL 366</td>
<td>ECOSYSTEMS OF WILDLAND SOILS</td>
</tr>
<tr>
<td>or SOIL 388</td>
<td>SOIL SYSTEMS AND PLANT GROWTH</td>
</tr>
<tr>
<td>or SOIL 466</td>
<td>SOIL MORPHOLOGY AND CLASSIFICATION</td>
</tr>
</tbody>
</table>

**Social and Ethical Considerations**

Select one course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FES 350/HORT 350</td>
<td>URBAN FORESTRY</td>
</tr>
<tr>
<td>FOR 431</td>
<td>ECONOMICS AND POLICY OF FOREST WILDLAND FIRE</td>
</tr>
<tr>
<td>NR 312</td>
<td>CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES</td>
</tr>
<tr>
<td>PHL 440</td>
<td>*ENVIRONMENTAL ETHICS</td>
</tr>
<tr>
<td>PHL 443/REL 443</td>
<td>*WORLD VIEWS AND ENVIRONMENTAL VALUES</td>
</tr>
<tr>
<td>SOC 480</td>
<td>*ENVIRONMENTAL SOCIOLOGY</td>
</tr>
<tr>
<td>SOC 481</td>
<td>*SOCIETY AND NATURAL RESOURCES</td>
</tr>
</tbody>
</table>

**Ecological and Natural Resource Electives (12 credits)**

Select a minimum of 12 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 351</td>
<td>MARINE ECOLOGY</td>
</tr>
<tr>
<td>BOT 488</td>
<td>ENVIRONMENTAL PHYSIOLOGY OF PLANTS</td>
</tr>
<tr>
<td>FES 440</td>
<td>WILDLAND FIRE ECOLOGY</td>
</tr>
<tr>
<td>or FOR 436</td>
<td>WILDLAND FIRE SCIENCE AND MANAGEMENT</td>
</tr>
<tr>
<td>FES 452/FW 452</td>
<td>BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
</tr>
<tr>
<td>FOR 441</td>
<td>SILVICULTURE PRINCIPLES</td>
</tr>
<tr>
<td>FW 320</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
</tr>
<tr>
<td>FW 426</td>
<td>COASTAL ECOLOGY AND RESOURCE MANAGEMENT</td>
</tr>
<tr>
<td>FW 451</td>
<td>AVIAN CONSERVATION AND MANAGEMENT</td>
</tr>
<tr>
<td>FW 454</td>
<td>*FISHERY BIOLOGY</td>
</tr>
<tr>
<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
</tr>
<tr>
<td>FW 458</td>
<td>MAMMAL CONSERVATION AND MANAGEMENT</td>
</tr>
<tr>
<td>FW 473</td>
<td>FISH ECOLOGY</td>
</tr>
<tr>
<td>FW 481</td>
<td>WILDLIFE ECOLOGY</td>
</tr>
<tr>
<td>NR 202</td>
<td>NATURAL RESOURCE PROBLEMS AND SOLUTIONS</td>
</tr>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
</tr>
<tr>
<td>RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
</tr>
<tr>
<td>SOIL 468</td>
<td>SOIL LANDSCAPE ANALYSIS</td>
</tr>
<tr>
<td>Z 349</td>
<td>*BIODIVERSITY CAUSES, CONSEQUENCES, AND CONSERVATION</td>
</tr>
<tr>
<td>Z 423</td>
<td>ENVIRONMENTAL PHYSIOLOGY</td>
</tr>
</tbody>
</table>

**Total Hours** 40-44

Fish and Wildlife Conservation Option

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Also available at OSU-Cascades and via Ecampus.

This option prepares students for a career in the broad arena of natural resource and wildlife conservation. It emphasizes understanding the relationship between animal species and their habitat requirements and the ability to apply this knowledge to the management of ecosystems as a means of conserving fish and wildlife.

**Option Code: 672**

Minimum of 40 credits is required with at least 20 upper-division credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 373</td>
<td>*FIELD METHODS IN MARINE ECOLOGY</td>
</tr>
<tr>
<td>BI 375</td>
<td>FIELD METHODS IN ECOLOGICAL RESTORATION</td>
</tr>
<tr>
<td>FW 255</td>
<td>FIELD SAMPLING OF FISH AND WILDLIFE</td>
</tr>
<tr>
<td>FW 493</td>
<td>FIELD METHODS FOR MARINE RESEARCH</td>
</tr>
<tr>
<td>NR 325</td>
<td>SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS</td>
</tr>
<tr>
<td>RNG 441</td>
<td>RANGELAND ANALYSIS</td>
</tr>
</tbody>
</table>

**Foundations of Conservation (12-14 credits)**

Select three courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>FES 342</td>
<td>FOREST TYPES OF THE NORTHWEST</td>
</tr>
<tr>
<td>or FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
</tr>
<tr>
<td>FES 440</td>
<td>WILDLAND FIRE ECOLOGY</td>
</tr>
<tr>
<td>or FOR 346</td>
<td>TOPICS IN WILDLAND FIRE</td>
</tr>
<tr>
<td>or FOR 436</td>
<td>WILDLAND FIRE SCIENCE AND MANAGEMENT</td>
</tr>
<tr>
<td>FES 452/FW 452</td>
<td>BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
</tr>
<tr>
<td>or FW 370</td>
<td>CONSERVATION GENETICS</td>
</tr>
<tr>
<td>FW 251</td>
<td>PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
</tr>
</tbody>
</table>

**Fish and Wildlife Biology (9-12 credits)**

Select three courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW 302</td>
<td>BIOLOGY AND CONSERVATION OF MARINE MAMMALS</td>
</tr>
<tr>
<td>FW 311</td>
<td>ORNITHOLOGY</td>
</tr>
<tr>
<td>FW 315</td>
<td>ICHTHYOLOGY</td>
</tr>
<tr>
<td>FW 317</td>
<td>MAMMALOGY</td>
</tr>
<tr>
<td>FW 320</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
</tr>
<tr>
<td>FW 321</td>
<td>APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY</td>
</tr>
<tr>
<td>FW 331</td>
<td>ECOLOGY OF MARINE AND ESTUARINE BIRDS</td>
</tr>
<tr>
<td>FW 473</td>
<td>FISH ECOLOGY</td>
</tr>
<tr>
<td>FW 481</td>
<td>WILDLIFE ECOLOGY</td>
</tr>
<tr>
<td>Z 423</td>
<td>ENVIRONMENTAL PHYSIOLOGY</td>
</tr>
<tr>
<td>Z 473</td>
<td>HERPETOLOGY</td>
</tr>
</tbody>
</table>

**Habitat Management (6-9 credits)**

Select two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
</tr>
<tr>
<td>FW 326</td>
<td>INTEGRATED WATERSHED MANAGEMENT</td>
</tr>
<tr>
<td>FW 426</td>
<td>COASTAL ECOLOGY AND RESOURCE MANAGEMENT</td>
</tr>
<tr>
<td>FW 434/OC 434</td>
<td>ESTUARINE ECOLOGY</td>
</tr>
<tr>
<td>FW 435</td>
<td>*WILDLIFE IN AGRICULTURAL ECOSYSTEMS</td>
</tr>
<tr>
<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
</tr>
<tr>
<td>FW 479</td>
<td>WETLANDS AND RIPARIAN ECOLOGY</td>
</tr>
<tr>
<td>RNG 341</td>
<td>RANGELAND ECOLOGY AND MANAGEMENT</td>
</tr>
<tr>
<td>RNG 455</td>
<td>RIPARIAN ECOHYDROLOGY AND MANAGEMENT</td>
</tr>
<tr>
<td>SOIL 366</td>
<td>ECOSYSTEMS OF WILDLAND SOILS</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)

Up to 6 credits of appropriate internships, projects, or study abroad may be used to fulfill credit requirements in the 'Social and Ethical Considerations' or 'Ecological and NR Electives' as approved by petition.

**Option Code: 663**
Forest Ecosystems Option

Natural Resource Policy (3 credits)
Select one course from the following: 3
- FES 486 *PUBLIC LANDS POLICY AND MANAGEMENT
- FW 350 *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY
- FW 415 FISHERIES AND WILDLIFE LAW AND POLICY
- FW 439 *HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT
- FOR 462 NATURAL RESOURCE POLICY AND LAW

Electives (6-8 credits)
Select two courses from the following: 6-8
- BI 347 *OCEANS IN PERIL
- ENSE 479 **ENVIRONMENTAL CASE STUDIES
- FW 323 MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST
- or FW 360 *ORIGINS OF F&W MANAGEMENT: EVOLUTION, GENETICS, AND ECOLOGY
- or FW 470 *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN

Total credits needed for option is a minimum of 40

This option will assist students in understanding the nature of forest ecosystems and the processes by which they function. Course work includes an understanding of the multiple resources and values associated with forest ecosystems and some of the techniques involved in managing them.

Option Code: 673

Minimum of 40 credits with 20 upper division credits required.
**Human Dimensions in Natural Resources Option**

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Also available via Ecampus.

The student will develop an understanding of the interconnectedness of human behavior and well-being and natural resources. It includes skills and knowledge to better understand the cultural, social, political, and philosophical issues associated with natural resources, and prepares students to work with various stakeholders in natural resource management.

**Option Code: 675**

Minimum of 40 credits with at least 20 upper-division credits required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FES 365</td>
<td>*ISSUES IN NATURAL RESOURCES CONSERVATION</td>
<td></td>
</tr>
<tr>
<td>FES 455/HORT 455</td>
<td>URBAN FOREST PLANNING, POLICY AND MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FES 486</td>
<td>*PUBLIC LANDS POLICY AND MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FW 251</td>
<td>PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
<td></td>
</tr>
<tr>
<td>FW 326</td>
<td>INTEGRATED WATERSHED MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FW 350</td>
<td>*ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY</td>
<td></td>
</tr>
<tr>
<td>FW 439</td>
<td>*HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FW 462</td>
<td>ECOSYSTEM SERVICES</td>
<td></td>
</tr>
<tr>
<td>GEOG 250</td>
<td>*LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES</td>
<td></td>
</tr>
<tr>
<td>GEOG 430</td>
<td>RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>GEOG 451</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
<td></td>
</tr>
<tr>
<td>GEOG 452</td>
<td>SUSTAINABLE SITE PLANNING</td>
<td></td>
</tr>
<tr>
<td>NR 202</td>
<td>NATURAL RESOURCE PROBLEMS AND SOLUTIONS</td>
<td></td>
</tr>
<tr>
<td>TRAL 351</td>
<td>OUTDOOR RECREATION MANAGEMENT ON PUBLIC LANDS</td>
<td></td>
</tr>
<tr>
<td>TRAL 352</td>
<td>WILDERNESS MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>TRAL 354</td>
<td>COMMUNITIES, NATURAL AREAS, AND SUSTAINABLE TOURISM</td>
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</tr>
</tbody>
</table>

**Social Issues (15 credits)**

Required background course:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 204</td>
<td>*INTRODUCTION TO SOCIOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 12 credits from the following:

- ANTH 110 | *INTRODUCTION TO CULTURAL ANTHROPOLOGY |
- ANTH 477 | ECOLOGICAL ANTHROPOLOGY |
- ANTH 481 | *NATURAL RESOURCES AND COMMUNITY VALUES |
- FW 340 | *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES |
- GEOG 300 | *SUSTAINABILITY FOR THE COMMON GOOD |
- GEOG 331 | *POPULATION, CONSUMPTION, AND ENVIRONMENT |
- HST 481 | *ENVIRONMENTAL HISTORY OF THE UNITED STATES |
- NR 351 | *WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT |
- SOC 381 | SOCIAL DIMENSIONS OF SUSTAINABILITY |
- SOC 480 | *ENVIRONMENTAL SOCIOLOGY |
- SOC 481 | *SOCIETY AND NATURAL RESOURCES |
- SUS 350 | *SUSTAINABLE COMMUNITIES |
- SUS 420 | SOCIAL DIMENSIONS OF SUSTAINABILITY |
- WGSS 440 | *WOMEN AND NATURAL RESOURCES |

**Option Code: 675**

**Individualized Specialty Option**

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Also available at OSU-Cascades and via Ecampus.

A specialty option is a required part of the Natural Resources major that allows the students to develop depth and focus in a particular area of natural resource management.
The Individualized Specialty option is a student-designed option that allows a student to tailor their academic program to specific goals or interests. In consultation with their academic advisor, students will develop a program of study that meets their goals, as well as program requirements. Students should contact their assigned academic advisor for information on developing an Individualized Specialty option.

**Option Code: 676**

Minimum of 40 credits with 20 credits of upper-division credits required.

**Integrated Conservation Analysis Option**

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Students pursuing this option will learn to recognize, understand, analyze and evaluate complex natural resource problems through a cross disciplinary approach. They will contribute to finding solutions to these critical issues by developing depth of knowledge in a disciplinary focus and by preparing to work on cross disciplinary teams. Students will learn to communicate their findings effectively to diverse groups and apply conflict resolution, leadership, and collaboration skills effectively.

**Disciplinary Focus**

- Students will select an area of study for disciplinary depth from Policy, Social Science/Human Dimensions or an Ecological discipline.
- Students will be required to submit an academic plan for completion of the option which will be approved by the Natural Resources Program Director. The academic plan must include a minimum of 20 upper-division courses.

**Option Code: 735**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR 325</td>
<td>SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS</td>
<td>3</td>
</tr>
<tr>
<td>NR 202</td>
<td>NATURAL RESOURCE PROBLEMS AND SOLUTIONS</td>
<td>3</td>
</tr>
<tr>
<td>NR 312</td>
<td>CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES</td>
<td>3</td>
</tr>
<tr>
<td>NR 351</td>
<td>*WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT</td>
<td>3</td>
</tr>
</tbody>
</table>

**Option Requirements**

- Baccalaureate Core Course (BCC)

**Disciplinary Focus**

- Students will select a minimum of 28 credits
- Total Hours 40

This option prepares students to work with Geographic Information Science technology in a natural resource field such as wildfire ecology, land use planning, forestry, ecological restoration, and more. The pairing of the technical skills of GiScience with a disciplinary knowledge in a natural resource area will prepare students for the practical application of technical skills in the real world.

In addition, this specialty option will allow students to earn the GiScience Undergraduate Certificate through the College of Earth, Ocean, and Atmospheric Sciences concurrently with their BS degree through the College of Forestry. The student will apply to the GiScience Certificate Program as well as the Natural Resources Program.

Students should contact Kuuipo Walsh (kuuipo.walsh@oregonstate.edu), GiScience Certificate Program Director, to enroll in the GiScience Certificate Program.

**Option Code: 689**

No S/U grades are accepted for the GEO courses that are counted for the GIS Certificate.

A minimum of 40 credits with 20 upper-division credits are required.

**Code Title Hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE 208</td>
<td>FOREST SURVEYING</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 201</td>
<td>*FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 360</td>
<td>GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 361</td>
<td>GISCIENCE II: ANALYSIS AND APPLICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 370</td>
<td>GEOVISUALIZATION: CARTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 480</td>
<td>REMOTE SENSING II: PRINCIPLES AND APPLICATIONS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Disciplinary Focus**

- Students will select two courses from the following:
  - CE 413 GIS IN WATER RESOURCES
  - CROP 414/HORT 414 PRECISION AGRICULTURE
  - ECE 468 DIGITAL IMAGE PROCESSING
  - ENSC 410 ENVIRONMENTAL SCIENCE INTERNSHIP
  - FW 303 SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE
  - GEDG 361 GISCIENCE II: ANALYSIS AND APPLICATIONS
  - GEDG 371 GEOVISUALIZATION: WEB MAPPING
  - GEDG 451 PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES
  - GEDG 462 GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS
  - GEDG 463 GISCIENCE IV: SPATIAL MODELING
  - GEDG 464 GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS
  - GEDG 472 GEOVISUALIZATION: GEOVISUAL ANALYTICS
  - GEDG 481 REMOTE SENSING II: DIGITAL IMAGE PROCESSING
  - SOIL 468 SOIL LANDSCAPE ANALYSIS

**Natural Resource Electives (12-14 credits)**

Select a minimum of 12–14 credits in a disciplinary area related to GiScience

**Total credits needed for option is a minimum of 40**
Baccalaureate Core Course (BCC)

Writing Intensive Course (WIC)

Up to 6 credits of appropriate internships, projects or study abroad may be used to fulfill requirements in this option as approved by petition.

Students will be required to submit an academic plan for completion of the option which will be approved by the Natural Resources Program Director.

Option Code: 689

Natural Resource Education Option

This option is offered within the following major(s):

• Natural Resources - College of Forestry (p. 523)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

This option will prepare students for careers as natural resource educators. Students may choose to focus on teaching in informal settings such as interpretive center, aquariums, museums, and parks or pursue a career in formal education in a K-12 classroom.

Students on the Corvallis campus may wish to explore the Education Double Degree (https://education.oregonstate.edu/education-double-degree/) program offered by the College of Education which allows students to earn a BA or BS in Education as well as their BS in Natural Resources. Courses in this option may be double counted with the Education Double Degree where applicable.

Option Code: 679

Minimum of 40 credits with 20 upper-division credits required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measurements (4 credits)</td>
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<tr>
<td></td>
<td>FES 430 FOREST AS CLASSROOM</td>
<td>4</td>
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<tr>
<td></td>
<td>Natural Resource Base (10 credits)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOR 111 INTRODUCTION TO FORESTRY</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>FES 342 FOREST TYPES OF THE NORTHWEST</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FW 251 PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>TRAL 493 ENVIRONMENTAL INTERPRETATION</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Education and Program Development (12 credits)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ED 216 *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>ED 219 CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
<td></td>
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<tr>
<td></td>
<td>ED 253 LEARNING ACROSS THE LIFESPAN</td>
<td>3</td>
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<tr>
<td></td>
<td>ED 496 TECHNOLOGY FOR EDUCATORS</td>
<td>3</td>
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<tr>
<td></td>
<td>SED 413 INQUIRY IN SCIENCE AND SCIENCE EDUCATION</td>
<td>3</td>
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<td></td>
<td>Electives (14 credits)</td>
<td>14</td>
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</table>

Table Hours 40

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Education Electives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ED 216 *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>ED 219 CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
<td></td>
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<tr>
<td></td>
<td>ED 309 FIELD PRACTICUM</td>
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<tr>
<td></td>
<td>ED 411 EDUCATIONAL PSYCHOLOGY, LEARNING AND DEVELOPMENT</td>
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<td></td>
<td>ED 412 LEARNING STYLES AND NEEDS IN ADOLESCENCE</td>
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<td></td>
<td>SED 406 PROJECTS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SED 412 TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE</td>
<td></td>
</tr>
</tbody>
</table>

Policy and Management Option

This option is offered within the following major(s):

• Natural Resources - College of Forestry (p. 523)

Also available via Ecampus (http://ecampus.oregonstate.edu/).

This option will prepare students for careers in the broad arena of natural resource and environmental conservation, with an emphasis on the social and political aspects of resource issues.

Option Code: 791

Minimum of 40 credits with 20 credits upper division required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measurements (4 credits)</td>
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</tr>
<tr>
<td></td>
<td>FES 422 RESEARCH METHODS IN SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>PS 300 *RESEARCH METHODS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Science Foundation (7-8 credits)</td>
<td></td>
</tr>
</tbody>
</table>
PS 201  *INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS  4

Select one course from the following:  
AEC 250  *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY  3-4
AEC 253  *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS
ECON 201  *INTRODUCTION TO MICROECONOMICS
SOC 204  *INTRODUCTION TO SOCIOLOGY

Social Sciences and Natural Resources (6-8 credits)

Select two courses from the following:  
AG 301  *ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS
ANTH 477  ECOCULTURAL ANTHROPOLOGY
FW 323  MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST
FW 340  *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES
FW 470/HSTS 470  *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN
GEOG 240  *CLIMATE CHANGE, WATER AND SOCIETY
GEOG 250  *LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES
GEOG 300  *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 350  *GEOGRAPHY OF NATURAL HAZARDS
GEOG 430  RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT
GEOG 450  LAND USE IN THE AMERICAN WEST
or GEOG 451  PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES
or GEOG 452  SUSTAINABLE SITE PLANNING
NR 202  NATURAL RESOURCE PROBLEMS AND SOLUTIONS
NR 312  CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES
NR 351  WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT
SOC 480  *ENVIRONMENTAL SOCIOLOGY
SOC 481  *SOCIETY AND NATURAL RESOURCES

Natural Resource Policy (12-13 credits)

Select courses from at least two departments from the following:  
AEC 351  *NATURAL RESOURCE ECONOMICS AND POLICY
AEC 352/ECON 352  *ENVIRONMENTAL ECONOMICS AND POLICY
AEC 353  *INTRODUCTION TO COASTAL AND MARINE RESOURCE ECONOMICS
AEC 432  ENVIRONMENTAL LAW
AEC 452  MARINE ECONOMICS
AEC 453  CONSERVATION ON PRIVATE LAND
FES 365  *ISSUES IN NATURAL RESOURCES CONSERVATION
FES 486  *PUBLIC LANDS POLICY AND MANAGEMENT
FOR 431  ECONOMICS AND POLICY OF FOREST WILDLAND FIRE
FOR 460  *FOREST POLICY
FOR 462  NATURAL RESOURCE POLICY AND LAW
FW 350  *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY
FW 415  FISHERIES AND WILDLIFE LAW AND POLICY
FW 422  INTRODUCTION TO OCEAN LAW
PS 455  *THE POLICIES OF CLIMATE CHANGE
PS 461  ENVIRONMENTAL POLITICAL THEORY
PS 470  GLOBAL FOOD POLICIES AND POLICY
PS 473  U.S. ENERGY POLICY
PS 475  ENVIRONMENTAL POLICIES AND POLICY
PS 477  INTERNATIONAL ENVIRONMENTAL POLICIES AND POLICY
PS 478  RENEWABLE ENERGY POLICY

Urban Forest Landscapes Option

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

Also available via Ecampus.

This option will help students understand the complexities surrounding the culture and management of urban forest ecosystems. It includes an examination of the economic, social, and environmental benefits and values of trees in urban areas, and the relationship between people and trees.

Option Code: 791

Minimum of 40 credits with 20 upper-division credits required.

Code Title Hours

Measurements

Select one course from the following:  
BOT 440  FIELD METHODS IN PLANT ECOLOGY
GEOG 360  GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY

Urban Forest Foundations

Select one from the following:  
BOT 341  PLANT ECOLOGY
BOT 350  INTRODUCTORY PLANT PATHOLOGY
BOT 413  FOREST PATHOLOGY
FES 412  FOREST ENTOMOLOGY
FES 445/FW 445  ECOLOGICAL RESTORATION
Wildland Fire Ecology Option

This option is offered within the following major(s):

- Natural Resources - College of Forestry (p. 523)

This option will help students understand the nature of fire in wildland ecosystems. It includes an understanding of the dynamics of fire behavior and post-fire response.

__Option Code: 687__

Minimum of 40 credits with 20 credits upper-division required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FES 440</td>
<td>WILDLAND FIRE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
<td>4</td>
</tr>
<tr>
<td>or RNG 421</td>
<td>WILDLAND RESTORATION AND ECOLOGY</td>
<td></td>
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<tr>
<td>FES 454</td>
<td>MANAGING AT THE WILDLAND-URBAN INTERFACE</td>
<td>3</td>
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<tr>
<td>FOR 436</td>
<td>WILDLAND FIRE SCIENCE AND MANAGEMENT</td>
<td>4</td>
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</table>

**Ecological and Natural Resource Electives**

Select 22-23 credits of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
<td>3-4</td>
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<tr>
<td>BOT 414</td>
<td>AGROSTOLOGY</td>
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<td>BOT 425</td>
<td>FLORA OF THE PACIFIC NORTHWEST</td>
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<td>CROP 440</td>
<td>WEED MANAGEMENT</td>
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<tr>
<td>FE 208</td>
<td>FOREST SURVEYING</td>
<td></td>
</tr>
<tr>
<td>FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
<td></td>
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<tr>
<td>FES 341</td>
<td>FOREST ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>FES 342</td>
<td>FOREST TYPES OF THE NORTHWEST</td>
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</tr>
<tr>
<td>FES 412</td>
<td>FOREST ENTOMOLOGY</td>
<td></td>
</tr>
<tr>
<td>FES 452/FW 452</td>
<td>BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
<td></td>
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<tr>
<td>FOR 346</td>
<td>TOPICS IN WILDLAND FIRE</td>
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<tr>
<td>FOR 413/BOT 413</td>
<td>FOREST PATHOLOGY</td>
<td></td>
</tr>
<tr>
<td>FOR 431</td>
<td>ECONOMICS AND POLICY OF WILDLAND FIRE</td>
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<tr>
<td>FOR 441</td>
<td>SILVICULTURE PRINCIPLES</td>
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</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 687

Sustainable Natural Resources Graduate Certificate

Available only via Ecampus.

The Sustainable Natural Resources graduate certificate is an 18-credit interdisciplinary program offered online through Ecampus. Students have a choice among 12 courses designed to build personal and organizational capacity to examine the many aspects of natural resource problems—environmental, economic, and social—in the search for innovative solutions. The courses are organized into three main sections: integration, human dimensions, and ecology and management of sustainable natural resources. All courses in the certificate program are integrated through a student-designed capstone project that addresses a specific sustainability problem in the student’s own organization or region. Throughout the program, students will work with faculty members and other students, and under the guidance of an assigned mentor to design and complete the project.

Traditional university training provides rigor in individual disciplines. However, natural resource problems require synthesis of multiple perspectives and fields of knowledge. In addition, natural resource problems can be international in scope. Globalization clearly reveals how decisions and practices in any part of the world affect natural resources elsewhere and highlights a need for natural resource professionals who can apply multidisciplinary systems-thinking to address these complex issues. The SNR graduate certificate program is designed to meet that need.

By offering this program as an online series of courses, it is possible for people from around the world to participate and to receive their graduate certificate without having to take a leave of absence from their work. The opportunity to collaborate with natural resource managers or graduate students from other regions or countries offers all participants a broader perspective on management issues and potential solutions.

For additional information and advising, contact:

Badege Bishaw
Program Director
208 Richardson Hall
Oregon State University
Corvallis, OR 97331
541-737-9495
badege.bishaw@oregonstate.edu
More information, including international admissions requirements, may also be found on the Ecampus website (http://ecampus.oregonstate.edu/online-degrees/graduate/sustainable-natural-resources/).

Certificate Code: CG01

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SNR 506</td>
<td>INDEPENDENT PROJECT IN NATURAL RESOURCE SUSTAINABILITY</td>
<td>2</td>
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<tr>
<td>SNR 511</td>
<td>SUSTAINABLE NATURAL RESOURCE DEVELOPMENT</td>
<td>1</td>
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<tr>
<td>SNR 520</td>
<td>SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES</td>
<td>3</td>
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<tr>
<td>SNR 521</td>
<td>ECONOMICS OF SUSTAINABLE NATURAL RESOURCE MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>SNR 530</td>
<td>ECOLOGICAL PRINCIPLES OF SUSTAINABLE NATURAL RESOURCES</td>
<td>3</td>
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</table>

**Electives**

Select a minimum of 6 credits from the following:

- SNR 522: BASIC BELIEFS AND ETHICS IN NATURAL RESOURCES
- SNR 531: SUSTAINABLE SILVICULTURE AND FOREST CERTIFICATION
- SNR 532: PLANNING AGROFORESTRY PROJECTS
- SNR 533: NONTIMBER FOREST PRODUCTS: AN INTERDISCIPLINARY INTRODUCTION
- SNR 534: REDUCED IMPACT TIMBER HARVEST
- SNR 535: SUSTAINABLE MANAGEMENT OF AQUATIC AND RIPARIAN RESOURCES
- SNR 540: GLOBAL ENVIRONMENTAL CHANGE

Total Hours: 18

Certificate Code: CG01

**Tourism, Recreation, and Adventure Leadership Minor**

Available only at OSU-Cascades.

This minor provides basic knowledge about recreation resource planning and tourism management.

Minor Code: 958

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>TRAL 115</td>
<td>OUTDOOR LIVING SKILLS</td>
<td>2</td>
</tr>
<tr>
<td>TRAL 118</td>
<td>LABORATORY FOR OUTDOOR LIVING SKILLS</td>
<td>1</td>
</tr>
<tr>
<td>TRAL 130</td>
<td>INTRODUCTION TO OUTDOOR AND ADVENTURE PROFESSIONS</td>
<td>3</td>
</tr>
<tr>
<td>or TRAL 132</td>
<td>*FOUNDATIONS AND HISTORY OF OUTDOOR AND ADVENTURE PROFESSIONS</td>
<td></td>
</tr>
<tr>
<td>TRAL 215</td>
<td>GROUP FACILITATION</td>
<td>4</td>
</tr>
<tr>
<td>TRAL 280</td>
<td>OUTDOOR LEADERSHIP FUNDAMENTALS</td>
<td>3</td>
</tr>
<tr>
<td>TRAL 353</td>
<td>NATURE, ECO, AND ADVENTURE TOURISM</td>
<td>3</td>
</tr>
<tr>
<td>TRAL 474</td>
<td>OUTDOOR ADVENTURE EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>TRAL 476</td>
<td>RISK MANAGEMENT IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP</td>
<td>3</td>
</tr>
<tr>
<td>TRAL 479</td>
<td>*NATURE AND THE HUMAN EXPERIENCE</td>
<td>3</td>
</tr>
</tbody>
</table>

Select four credits from the following:

- PAC 110: INTRODUCTION TO WHITE WATER KAYAKING
- PAC 111: INTRODUCTION TO CANOEING
- TRAL 172: or PAC 172

Total Hours: 29

* Baccalaureate Core Course (BCC)

**Tourism, Recreation, and Adventure Leadership Undergraduate Major (BS, HBS)**

Also available at OSU-Cascades.

The Bachelor of Science (BS) in Tourism, Recreation and Adventure Leadership (TRAL) explores the importance of tourism and recreation in natural settings for community development, human health and quality of life, and the sustainable use of natural resources. Students will learn about management practices and public preferences to address contemporary tourism, recreation and outdoor leadership opportunities, and issues in natural settings. Studies include decision making within applicable laws and across cultural contexts, as well as communication to a variety of audiences, and successful supervision of employees and volunteers. The TRAL program covers best practices for planning, developing, and managing recreation resources in natural settings. Students learn to evaluate and integrate experiential, economic, biophysical, and social concepts. They study interaction across natural resources and the consequences of development, management, and marketing decisions.

The following two options are available to Corvallis-based students majoring in TRAL:

1. Outdoor Recreation Management
2. Sustainable Tourism Management

The following two options are available to Cascades-campus students majoring in TRAL:

1. Nature, Eco and Adventure Tourism
2. Adventure Leadership Education

Major Code: 872

Completion of an approved option is required for the Tourism, Recreation, and Adventure Leadership degree. Declaration of the option must be done by the end of the sophomore year, or at least six (6) terms prior to graduation. Courses for an option are in addition to the core curriculum. Some courses may require prerequisites not included in the core curriculum.

- All students pursuing the BS in TRAL must earn grades of C or better in all courses for the major (or approved substitutions)
- All students pursuing the BS in TRAL must complete at least six months of work experience related to the major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
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<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>FES 422</td>
<td>RESEARCH METHODS IN SOCIAL SCIENCE</td>
<td>4</td>
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</tbody>
</table>

Select one of the following:

- ANTH 481: *NATURAL RESOURCES AND COMMUNITY VALUES
- FES 485: *CONSSENSUS AND NATURAL RESOURCES
Major Code: 872

**Adventure Leadership Education Option**

This option is offered within the following major(s):
- Tourism, Recreation, and Adventure Leadership - College of Forestry (p. 534)

Available only at OSU-Cascades.

Designed for students pursuing careers as educators, guides and managers/owners in the outdoor and adventure education field.

**Option Code: 875**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>TRAL 130</td>
<td>INTRODUCTION TO OUTDOOR AND ADVENTURE PROFESSIONS</td>
<td>3</td>
</tr>
<tr>
<td>TRAL 132</td>
<td>*FOUNDATIONS AND HISTORY OF OUTDOOR AND ADVENTURE PROFESSIONS</td>
<td>3</td>
</tr>
<tr>
<td>PAC 110/TRAL 110</td>
<td>INTRODUCTION TO WHITE WATER KAYAKING</td>
<td>2</td>
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<tr>
<td>PAC 111/TRAL 111</td>
<td>INTRODUCTION TO CANOEING</td>
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<tr>
<td>TRAL 115/PAC 115</td>
<td>OUTDOOR LIVING SKILLS</td>
<td>2</td>
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<tr>
<td>TRAL 118/PAC 118</td>
<td>LABORATORY FOR OUTDOOR LIVING SKILLS</td>
<td>1</td>
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<tr>
<td>TRAL 173/PAC 173</td>
<td>INTERMEDIATE ROCK CLIMBING</td>
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**Second Year (11)**

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<td>TRAL 215</td>
<td>GROUP FACILITATION</td>
<td>4</td>
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<tr>
<td>TRAL 218</td>
<td>ROCK SITE MANAGEMENT</td>
<td>2</td>
</tr>
<tr>
<td>TRAL 260</td>
<td>INTERMEDIATE PADDLESPORT</td>
<td>2</td>
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<tr>
<td>TRAL 280</td>
<td>OUTDOOR LEadership FUNDAMENTALS</td>
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**Junior Year (29)**

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<tbody>
<tr>
<td>TRAL 270</td>
<td>PRE-INTERNSHIP SEMINAR</td>
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<tr>
<td>TRAL 309</td>
<td>CERTIFICATION PRACTICUM</td>
<td>2</td>
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<tr>
<td>TRAL 370</td>
<td>DESIGN AND MANAGEMENT OF OUTDOOR EXPERIENCES</td>
<td>4</td>
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<tr>
<td>TRAL 374</td>
<td>OUTDOOR ADVENTURE EDUCATION</td>
<td>3</td>
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<tr>
<td>TRAL 375</td>
<td>*EXPERIENTIAL EDUCATION</td>
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<td>TRAL 377</td>
<td>EXPEDITIONS I WATER</td>
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<tr>
<td>TRAL 379</td>
<td>EXPEDITIONS I-LAND</td>
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**Senior Year (12)**

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<tr>
<td>TRAL 410</td>
<td>INTERNSHIP</td>
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<td>TRAL 476</td>
<td>RISK MANAGEMENT IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP</td>
<td>3</td>
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<tr>
<td>TRAL 479</td>
<td>*NATURE AND THE HUMAN EXPERIENCE</td>
<td>3</td>
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</table>

Plus Bacc Core, TRAL Core and additional electives to meet OSU graduation requirements

Total Hours: 67

**Option Code: 875**

<table>
<thead>
<tr>
<th>Course</th>
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<td>Fall</td>
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<tr>
<td>ALS 199</td>
<td>SPECIAL TOPICS</td>
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<tr>
<td>MTH 105</td>
<td>*INTRODUCTION TO CONTEMPORARY MATHEMATICS or *COLLEGE ALGEBRA</td>
<td>3-4</td>
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<tr>
<td>PAC 110</td>
<td>INTRODUCTION TO WHITE WATER KAYAKING</td>
<td>2</td>
</tr>
<tr>
<td>PAC 111</td>
<td>INTRODUCTION TO CANOEING</td>
<td>2</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>TRAL 130</td>
<td>INTRODUCTION TO OUTDOOR AND ADVENTURE PROFESSIONS</td>
<td>3</td>
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</tbody>
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| Winter     |                                                        |       |
| COMM 111   | *PUBLIC SPEAKING                                                    | 3     |
| WR 222     | *ENGLISH COMPOSITION                                                | 3     |
| TRAL 132   | *FOUNDATIONS AND HISTORY OF OUTDOOR AND ADVENTURE PROFESSIONS       | 3     |
| Bacc Core. Physical Science |                                                    | 4     |
| Bacc Core. Social Process & Institutions |                                                    | 4     |
| Elective   |                                                        | 4     |

| Spring     |                                                        |       |
| FOR 112    | COMPUTING APPLICATIONS IN FORESTRY or SOFTWARE TOOLS IN QUANTITATIVE SOCIAL SCIENCE RESEARCH | 3     |
| HHS 231    | *LIFETIME FITNESS FOR HEALTH                                     | 2     |
| Bacc Core. Literature and the Arts              |                                                    | 4     |

**Second Year**

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>TRAL 215</td>
<td>GROUP FACILITATION</td>
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<tr>
<td>TRAL 260</td>
<td>INTERMEDIATE PADDLESPORT</td>
<td>2</td>
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<tr>
<td>Bacc Core. Bio Science</td>
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<td>4</td>
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<tr>
<td>Elective</td>
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<td>4</td>
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| Winter     |                                                        |       |
| TRAL 352   | WILDERNESS MANAGEMENT                                              | 3     |
| ST 201     | PRINCIPLES OF STATISTICS                                            | 4     |
| Bacc Core. Cultural Diversity |                                                    | 3     |
| Elective   |                                                        | 4     |

| Spring     |                                                        |       |
| Bacc Core. Literature and the Arts              |                                                    | 4     |
| TRAL 218   | ROCK SITE MANAGEMENT                                               | 2     |
| TRAL 280   | OUTDOOR LEADERSHIP FUNDAMENTALS                                    | 3     |
| FES 422    | RESEARCH METHODS IN SOCIAL SCIENCE                                 | 4     |
Nature, Eco, and Adventure Tourism Option

This option is offered within the following major(s):

• Tourism, Recreation, and Adventure Leadership - College of Forestry (p. 534)

Available only at OSU-Cascades.

Designed for students pursuing careers as managers or owners and guides in outfitter-guide and other natural resource based commercial recreation businesses (i.e., micro-level tourism).

Option Code: 876
Outdoor Recreation Management Option

This option is offered within the following major(s):

- Tourism, Recreation, and Adventure Leadership - College of Forestry (p. 534)

Designed for students pursuing careers as outdoor recreation planners and managers in public land management agencies and non-profit organizations at local, state, and federal levels. Students study land management, the process of permitting, and laws relevant to outdoor recreation. They create monitoring and assessment protocols for recreation resources in natural settings, and they learn to respectfully engage with individuals and groups that may have diverse perspectives and priorities regarding recreation opportunities. Students are trained to facilitate understanding and conflict resolution across these individuals and groups.

### Option Code: 873

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<td><strong>First Year</strong></td>
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<tr>
<td></td>
<td>ECON 201 (3)</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
</tr>
<tr>
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<td>or AEC 250 (3)</td>
<td>or *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY</td>
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<td>Select one of the following:</td>
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<tr>
<td></td>
<td>FES 420 (3)</td>
<td>*FOREST BIOLOGY</td>
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<td>or FW 452 (3)</td>
<td>or BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
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<td></td>
<td>or FES 452 (3)</td>
<td>or BIODIVERSITY CONSERVATION IN MANAGED FORESTS</td>
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<tr>
<td></td>
<td>FES 341 (3)</td>
<td>FOREST ECOLOGY</td>
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<tr>
<td></td>
<td>FES 440 (3)</td>
<td>WILDLAND FIRE ECOLOGY</td>
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<td>PRINCIPLES OF FISH AND WILDLIFE CONSERVATION</td>
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<td>FOR 111 (3)</td>
<td>INTRODUCTION TO FORESTRY</td>
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<td></td>
<td>AEC 351 (3)</td>
<td>*NATURAL RESOURCE ECONOMICS AND POLICY</td>
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<td>or TRAL 432 (3)</td>
<td>or ECONOMICS OF RECREATION AND TOURISM</td>
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<td>PRINCIPLES OF STATISTICS</td>
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<td>TRAL 351 (3)</td>
<td>OUTDOOR RECREATION MANAGEMENT ON PUBLIC LANDS</td>
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<td>TRAL 354 (3)</td>
<td>COMMUNITIES, NATURAL AREAS, AND SUSTAINABLE TOURISM</td>
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<td><strong>Third Year</strong></td>
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<td>FES 485 (3)</td>
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Total Hours: 176-177
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<td>ENSC 479</td>
<td>**ENVIRONMENTAL CASE STUDIES</td>
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<td>FOR 460</td>
<td>*FOREST POLICY</td>
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<td>TRAL 375</td>
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<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Plus** additional free electives if necessary to meet university requirement of 180 minimum credits.

**Note:** FOR 460 is listed in two places but may be counted only once. If selected to meet one requirement then a different class must be selected to meet the other requirement.

**Option Code: 873**

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<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY or MANAGING NATURAL RESOURCES FOR THE FUTURE</td>
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<td>or NR 201</td>
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<td>TRAL 251</td>
<td>RECREATION RESOURCE MANAGEMENT</td>
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<td>WR 121</td>
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<td><strong>Winter</strong></td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING or ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>*COLLEGE ALGEBRA</td>
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<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
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<td>Bacc Core, WR II</td>
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<td>Bacc Core, Western Culture</td>
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**Second Year**

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<td>*INTRODUCTION TO MACROECONOMICS</td>
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<td>PRINCIPLES OF STATISTICS</td>
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<td>NATURE, ECO, AND ADVENTURE TOURISM</td>
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<td>Bacc Core, Cultural Diversity</td>
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<td>INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS</td>
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**Third Year**

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<td>LAND USE IN THE AMERICAN WEST</td>
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<td>TRAL 352</td>
<td>WILDERNESS MANAGEMENT</td>
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<td>*PARKS AND PROTECTED AREAS MANAGEMENT</td>
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<td><strong>Winter</strong></td>
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<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
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<tr>
<td>FES 485</td>
<td>*CONSSENSUS AND NATURAL RESOURCES</td>
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<td>GEDG 451</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
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<td>ENVIRONMENTAL INTERPRETATION</td>
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**Fourth Year**

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<tr>
<td>FOR 462</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
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<td>or AEC 432</td>
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<td>SUSTAINABLE SITE PLANNING</td>
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<td>RURAL DEVELOPMENT ECONOMICS AND POLICY</td>
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<td>*ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS</td>
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<tr>
<td>FES 422</td>
<td>RESEARCH METHODS IN SOCIAL SCIENCE</td>
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Sustainable Tourism Management Option

This option is offered within the following major(s):

- Tourism, Recreation, and Adventure Leadership - College of Forestry (p. 534)

Designed for students pursuing careers as tourism destination planners, developers, and marketers in government, non-profit, or the private sector, in both domestic and international locations. This option applies business concepts to tourism, and explains best practices for planning, developing, and managing sustainable nature-based tourism. Students learn to create a business plan, apply business law principles, create marketing strategies, create financial statements, explain land management goals and permit processes. They learn to plan, develop and manage sustainable nature-based tourism in a manner that integrates experiential, economic, biophysical, and social data. They explore the consequences of development of natural resources in domestic and international tourism.

Option Code: 874

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<td>MANAGING NATURAL RESOURCES FOR THE FUTURE</td>
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<td>NR 202</td>
<td>NATURAL RESOURCE PROBLEMS AND SOLUTIONS</td>
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<td>INTRODUCTION TO FORESTRY</td>
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<td>TRAL 251</td>
<td>RECREATION RESOURCE MANAGEMENT</td>
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<td>ECONOMICS OF RECREATION AND TOURISM</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Plus additional free electives if necessary to meet university requirement of 180 minimum credits.

Note: FOR 460 is listed in two places but may be counted only once. If selected to meet one requirement then a different class must be selected to meet the other requirement.

Option Code: 874

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<td>GEED 360</td>
<td>GSCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY</td>
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<td>LAND USE IN THE AMERICAN WEST</td>
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**Urban Forestry Graduate Certificate**

**Available only via Ecampus.**

Urban forestry involves the planning, planting, and management of trees and related vegetation in and around cities. The urban forest is made up of the mosaic of the planted landscape and native forest remnants left behind as cities have developed. Urban forestry is an academic discipline that is related to forestry, horticulture, urban planning, landscape architecture, and land use planning. Urban foresters work in municipal governments, non-profit organizations, other public agencies, and the private sector.

The Graduate Certificate in Urban Forestry helps prepare students for leadership roles in a variety of different urban forestry programs. The course work covers important aspects of program management, policy development, and leadership. The capstone study allows the student to tailor the program to a particular interest within the field.

**Certificate Code:** CG13

Students complete 14 required credits, and take one or two elective courses resulting in a combined credits total of between 18 and 20 depending on the electives selected.

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<td>URBAN FOREST PLANNING, POLICY AND MANAGEMENT</td>
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<td>FES 560</td>
<td>GREEN INFRASTRUCTURE</td>
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<td>URBAN FORESTRY LEADERSHIP</td>
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<td>SNR 511</td>
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**Electives**

Select 4-6 credits from the following:

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<td>ECOLOGICAL RESTORATION</td>
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<td>FES 547/HORT 547</td>
<td>ARBORICULTURE</td>
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<td>FES 554</td>
<td>MANAGING AT THE WILDLAND-URBAN INTERFACE</td>
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<td>FES 585</td>
<td>CONSENSUS AND NATURAL RESOURCES</td>
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<td>FW 562</td>
<td>ECOSYSTEM SERVICES</td>
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<td>GEOG 551</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
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<td>GEOG 560</td>
<td>GISCIENCE I: INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE</td>
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**Total Hours:** 18-20

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**Urban Forestry Graduate Certificate**

**Available only via Ecampus.**

Urban forestry involves the planning, planting, and management of trees and related vegetation in and around cities. The urban forest is made up of the mosaic of the planted landscape and native forest remnants left behind as cities have developed. Urban forestry is an academic discipline that is related to forestry, horticulture, urban planning, landscape architecture, and land use planning. Urban foresters work in municipal governments, non-profit organizations, other public agencies, and the private sector.

The Graduate Certificate in Urban Forestry helps prepare students for leadership roles in a variety of different urban forestry programs. The course work covers important aspects of program management, policy development, and leadership. The capstone study allows the student to tailor the program to a particular interest within the field.

**Certificate Code:** CG13

Students complete 14 required credits, and take one or two elective courses resulting in a combined credits total of between 18 and 20 depending on the electives selected.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FES 506</td>
<td>PROJECTS</td>
<td>3</td>
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<tr>
<td>FES 555/HORT 555</td>
<td>URBAN FOREST PLANNING, POLICY AND MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>FES 560</td>
<td>GREEN INFRASTRUCTURE</td>
<td>4</td>
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<tr>
<td>FES 565</td>
<td>URBAN FORESTRY LEADERSHIP</td>
<td>2</td>
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<tr>
<td>SNR 511</td>
<td>SUSTAINABLE NATURAL RESOURCE DEVELOPMENT</td>
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**Electives**

Select 4-6 credits from the following:

<table>
<thead>
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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FES 545/FW 545</td>
<td>ECOLOGICAL RESTORATION</td>
<td>4-6</td>
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<tr>
<td>FES 547/HORT 547</td>
<td>ARBORICULTURE</td>
<td></td>
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<tr>
<td>FES 554</td>
<td>MANAGING AT THE WILDLAND-URBAN INTERFACE</td>
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<tr>
<td>FES 585</td>
<td>CONSENSUS AND NATURAL RESOURCES</td>
<td></td>
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<tr>
<td>FW 562</td>
<td>ECOSYSTEM SERVICES</td>
<td></td>
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<tr>
<td>GEOG 551</td>
<td>PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES</td>
<td></td>
</tr>
<tr>
<td>GEOG 560</td>
<td>GISCIENCE I: INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE</td>
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**Total Hours:** 18-20

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**Forest Engineering, Resources and Management**

The mission of the Department of Forest Engineering, Resources and Management (FERM) is to develop, communicate, and teach the science,
knowledge and engineering necessary for the sustainable management of forest, land, and water resources to achieve economic, environmental, and social objectives. Teaching and research focus on support and enhancement of active forest management across the full range of owner objectives, from ecosystem restoration to timber production. FERM includes biologists, engineers, economists, biometricians, hydrologists, silviculturists, and applied ecologists.

The Department of Forest Engineering, Resources and Management offers undergraduate degree programs leading to professional practice in forestry and forest engineering. It also offers more broadly defined graduate programs at the master’s and doctorate levels in Sustainable Forest Management, including six areas of concentration.

**Forestry Undergraduate Program**

The forest management profession requires an understanding of natural resource systems and the management of forest resources for multiple uses. The Bachelor of Science (BS) degree in Forestry provides a broad-based education with the goal of preparing students to be successful forest managers. Graduates must understand biological and physical processes occurring in forests, the social and economic forces that influence policies and actions affecting forests, natural resource systems, and management of forest resources for multiple uses. Students also learn how values affect forest management planning so they can communicate effectively with others and make relevant decisions.

The core curriculum provides a broad-based education which includes basic courses in the biological, physical, social sciences, as well as professional courses designed to prepare students to manage forest resources. The Forestry BS also requires six months of relevant work experience intended to provide the enhanced understanding of the professional workplace. Students are required to select one of three options and serves to fulfill the 180 credits for graduation:

- Forest Management
- Forest Operations Management
- Forest Restoration and Fire

Graduates are employed by private and public organizations. The private sector includes the timber and forest products industry, forestry consulting firms, environmental organizations, and self-employment. Public employers include federal, state, and local government agencies such as the U.S. Forest Service, Bureau of Land Management, National Park Service, and state departments of forestry and natural resources.

The Bachelor of Science degree in Forestry is accredited by the Society of American Foresters.

**Forest Engineering Undergraduate Program**

The Forest Engineering Undergraduate Program provides an engineering education within a strong forestry context. The program is founded on fundamental principles of forest science and engineering science. Forest Engineering program objectives are to prepare graduates to plan and implement complex forestry and natural resource operations that help meet global demands for wood products while sustaining water, habitat, and other forest resources. It provides ‘work-ready’ graduates for entry into the diverse professional field of forest engineering. Early career accomplishments include harvest unit design, forest road location and design, contract inspection and administration, cost analysis, and forest transportation management. Mid-career accomplishments commonly expand to involve aspects of engineering management, including planning and budgeting, supervision, wood supply procurement, harvest and road design reviews, and scheduling and controlling forest operations.

Specifically, the Forest Engineering Undergraduate Program provides fundamental coverage of the following:

- Fundamental engineering and forestry principles
- Physical and biological aspects of soil and water resources
- Surveying and measurement of land and forest resources
- Analysis and design of the forest transportation system
- Analysis and design of harvesting operations
- Economics and operational planning principles

Integration of these topics enables forest engineering graduates to develop and manage safe, economical, and environmentally sound forest operations. Design experiences that integrate the topics listed above and steadily build on previous course material are distributed throughout the upper-division portion of the program. The Forest Engineering capstone sequence during the senior year provides an opportunity for students to bring together all the topics from the curriculum in a project framework that includes the field and office engineering tasks associated with the planning and design of forest operations. The capstone sequence is integrated with the Forestry capstone sequence to provide realistic interdisciplinary planning and design experience.

Forest engineering graduates are employed by private forestry firms, public forestry agencies, logging and construction companies, engineering consulting firms, and surveying firms. Some graduates establish their own consulting businesses after a few years of field experience. Career progression following graduation can be quite varied. Some graduates gravitate toward technical positions while others move quickly toward management of harvesting and other forest operations, or more broadly defined management of the forest land base.

The Bachelor of Science degree in Forest Engineering can be earned through completion of the Forest Engineering program or the Forest Engineering-Civil Engineering double degree program. The Bachelor of Science and Honors Bachelor of Science degrees in Forest Engineering are accredited by the Engineering Accreditation Commission ABET, http://www.ABET.org.

The BS in Forest Engineering is also accredited by the Society of American Foresters.

Completion of the five-year, double-degree Forest Engineering-Civil Engineering program results in a BS in Forest Engineering and a BS in Civil Engineering, offered by the School of Civil and Construction Engineering. The Bachelor of Science and Honors Bachelor of Science degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org.

Forest engineering is a licensed profession in the state of Oregon. The BS in Forest Engineering meets the administrative rules established by the Oregon State Board of Examiners for Engineering and Land Surveying (OSBEELS) as evidence of adequate preparation for the Fundamentals of Engineering Examination, the first of two examinations required
for professional engineering licensing. The BS in Forest Engineering, with the completion of appropriate program electives, also meets the OSBEELS administrative rules for evidence of adequate preparation for the Fundamentals of Land Surveying Examination, the first of two examinations required for professional land surveyor licensing.

**Undergraduate Programs**

**Majors**
- Forest Engineering (p. 552)
- Forest Engineering-Civil Engineering (p. 549)
- Forestry (p. 555)

**Options:**
- Forest Management
- Forest Operations Management
- Forest Restoration and Fire

**Minor**
- Forestry (p. 555)

**Graduate Programs**

**Major**
- Sustainable Forest Management (p. 561)

**Faculty**

**Professors** Bailey, Chung, Davis, Fitzgerald, Johnson, Landgren, Maguire, Reed, Sessions PE, Shaw, Temesgen

**Associate Professors** Bennett, Hatten, Leshchinsky PE, Lyons, Punches, Wing CWRE, PE, PLS

**Assistant Professors** Belart, Bladon, Gonzalez-Benecke, Kuusela, LeBoldus, Powers, Segura, Souder, Strimbu

**Assistant Professor of Practice** Cushing, Christiansen, Grand, Leavell, Kline

**Senior Instructor II** Wimer

**Senior Instructor I** Kiser

**Emeritus** D. Adams, P. Adams, Atkinson, Bell, Boyle, Brodie, Brown, Elwood, Fletcher, Garland PE, Hann, Hermann, Hobbs, Kellogg, Montgomery, Murphy, Newton, Olsen, Pyles PE, Skaugset RPE, Tappeiner, Tesch, Walstad

**Adjunct Faculty**
- J. Jones, M. Olsen

**Courtesy/Affiliate Faculty**
- Ager, Amishev, Argerich, Barrett, Burnett, Cloughsey, Coble, Dumroese, Ferreiro, Frey, Fried, Han, Harrington, Hessburg, Johnson, Kaetzel, Kerns, Kim, Lake, Latta, Lee, Lesmeister, Lieberg, Light, Marshall, McNassar, Monleon, Moriarty, Pinto, Rathbun, Riegel, Sobota, Stednick, Strunk, Ver Hoef, Wagenbrenner, White, Zald, Zamora

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**Forest Engineering**

**FE 101. INTRODUCTION TO FOREST ENGINEERING. (2 Credits)**
Introduction to the forest engineering discipline. Discussion of critical issues, available resources, career opportunities and professional opportunities. Overview of field instruments and analytical approaches.

**FE 102. FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY. (3 Credits)**
A technology applications course designed to introduce students to formulating and implementing computational solutions to engineering analysis and design problems in a digital environment. Students will learn to evaluate engineering problems, formulate one or more solution techniques or algorithms, and code the solution using spreadsheet and/or programming software. Professionalism in completing and presenting laboratory exercises is emphasized. Laboratory examples draw from a variety of engineering topics. This course may be substituted for CE 102, Civil Engineering I: Problem Solving and Technology.

Equivalent to: FE 215
Recommended: Calculus

**FE 206. ENGINEERING FOREST BIKING TRAILS. (2 Credits)**
Students will design trails that mitigate impact on the environment and other trail users, while still providing a fun experience for mountain bike riders. Topics include site classification, trail safety, water management, digital terrain models, and commercial road design software. This course will emphasize field and design work.

**FE 208. FOREST SURVEYING. (4 Credits)**
Introduction to theory and practice of surveying methods and measurements as applied to the specifics of forestry problems and their solutions. This is the first of a four-course sequence (FE 208, 209, 310, 311). Together with FE 257 it is designed to prepare students for the Fundamentals of Land Surveying exam, which is necessary to become a professional land surveyor.

Prerequisites: MTH 112 with C or better or MTH 241 with C or better or MTH 251 with C or better or MTH 251H with C or better or MTH 252 with C or better or MTH 252H with C or better

Equivalent to: FE 308

**FE 209. FOREST PHOTOGRAMMETRY AND REMOTE SENSING. (4 Credits)**
Management and conservation of natural resources with the fundamentals of spatial data acquisition from airborne and spaceborne sensors. Introduction to theory of spectral reflectance properties of vegetation, the principles of photographic analysis and aerial photo-interpretation and new advances such as LiDAR.

Prerequisites: MTH 112 with C or better or MTH 241 with C or better or MTH 251 with C or better or MTH 251H with C or better or MTH 252 with C or better or MTH 252H with C or better

Equivalent to: FE 309
FE 257. GIS AND FOREST ENGINEERING APPLICATIONS. (3 Credits)
An introduction to the appropriate use and potential applications of geographic information systems (GIS) and related technologies (GPS and remote sensing) in forest management and operational planning and problem solving. Students are presented with lectures and exercises that cover a wide range of GIS and GIS-related topics and issues including spatial database creation, structure, analysis, and modeling. Lec/lab.
Equivalent to: FE 357

FE 307. JUNIOR SEMINAR. (1 Credit)
College is the time to develop the skills necessary for the transition between academics and career. In conjunction with the expertise already available on campus, this course will guide students through career planning, exploration, placement, and employer expectations.
CROSSLISTED as FE 307/FOR 307.
Equivalent to: FOR 307

FE 310. FOREST ROUTE SURVEYING. (4 Credits)
Route surveying and site surveying applied to forestry problems. Use of surveying equipment; traversing; computations; leveling; horizontal, vertical, compound, reverse and spiral curves; earthwork; construction staking as applied to new road and existing road P-line survey. Includes rapid survey techniques. Lec/lab.
Prerequisites: (FE 208 with C or better or FE 308 with C or better) or CE 361 with C or better or CEM 263 with C or better

FE 312. FORESTRY FIELD SCHOOL. (2 Credits)
A hands-on experience in the major aspects of forestry, including regeneration surveys, silviculture, cruising, recreation, forest disturbances, logging site and mill visits, east and west of the Cascades Range. CROSSLISTED as FE 312/FOR 312.
Equivalent to: FOR 312

FE 315. SOIL ENGINEERING. (4 Credits)
Prerequisites: ENGR 213 (may be taken concurrently) with D- or better
Recommended: CE 311 or CEM 311 or FE 330

FE 316. SOIL MECHANICS. (4 Credits)
Soil strength and soil mechanics theories applied to analysis of slope stability, retaining structures, foundations, and pavements. Lec/lab.
Prerequisites: FE 315 (may be taken concurrently) with C- or better or CE 372 (may be taken concurrently) with D- or better

FE 330. FOREST ENGINEERING FLUID MECHANICS AND HYDRAULICS. (3 Credits)
Fluid properties, pressure, fluid statics, continuity, energy equation, single and series pipe flow, open channel hydraulics, peakflow estimates for culvert design, stream crossing design. Lec/lab.
Prerequisites: ENGR 213 (may be taken concurrently) with D- or better and FE 102 (may be taken concurrently) [C-]
Equivalent to: FE 431

FE 370. HARVESTING OPERATIONS. (4 Credits)
Timber harvesting and transport methods from the forest to the mill. Technical feasibility, economic, and environmental relationships in forestry operations. Junior standing in forestry required. For non-forest engineering students.
Prerequisites: PH 201 with C or better or PH 211 with C or better

FE 371. HARVESTING PROCESS ENGINEERING. (4 Credits)
Timber harvesting equipment and systems. Harvesting process evaluation and decisions aided by forest engineering analysis. Lec/lab.
Prerequisites: ENGR 211 with C or better and FE 102 [C]
Recommended: Concurrent enrollment in FE 208 and FE 357

FE 403. THESIS. (1-16 Credits)
PREREQ: Departmental approval required. This course is repeatable for 16 credits.

FE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FE 415. FOREST ROAD ENGINEERING. (3 Credits)
Location, surveying, design, cost estimation, and construction practices for forest roads. Lecture on principles, and laboratory field practice in locating, surveying, designing, and cost estimating.
Prerequisites: FE 310 with C- or better

FE 416. FOREST ROAD SYSTEM MANAGEMENT. (4 Credits)
Structural characteristics of bridges, load rating, structural design of culverts, aggregate testing and evaluation, environmental assessment of forest road systems, road maintenance cycles and management.
Prerequisites: (ENGR 211 with D- or better or ENGR 211H with D- or better) and (ENGR 213 [D-] or ENGR 213H [D-]) and FE 316 [C-] and FE 415 [C-]

FE 423. UNMANNED AIRCRAFT SYSTEM REMOTE SENSING. (3 Credits)
Unmanned Aircraft System (UAS) Geomatics presents techniques in UAS design and applications for remote sensing measurements of both natural and constructed landscapes.
Prerequisites: FE 309 with C or better or GEOG 480 with C or better or GEOG 481 with C or better or GEO 444 with C or better or GEO 466 with C or better

FE 430. WATERSHED PROCESSES. (4 Credits)
Effects of land use practices on the physical hydrology (interception, infiltration, evapotranspiration, subsurface flow and surface runoff, water yields, and peak flows) of forested watersheds. Surface erosion, mass soil movements, stream temperatures, nutrient levels and effects of management activities upon riparian systems; forest practice rules. Lec/ lab.

FE 434. FOREST WATERSHED MANAGEMENT. (4 Credits)
Physical hydrology, erosion processes, streams, and riparian areas of forested ecosystems. The material can be widely applied, but is applicable primarily to the humid, temperate rainforests of the Pacific Northwest.
Prerequisites: (CH 121 with C or better or CH 201 with C or better or CH 231 with C or better) and (SOIL 205 [C] or CSS 305 [C] or CSS 205 [C]) and (MTH 241 [C] or MTH 251 [C] or MTH 251H [C])

FE 436. FOREST DISTURBANCE HYDROLOGY. (3 Credits)
Impacts of forest disturbance, including timber harvest, wildfire, insect outbreaks, and low frequency storms and floods on watershed hydrology and streams.
Prerequisites: FE 434 with C or better
Equivalent to: FE 435
FE 440. FOREST OPERATIONS ANALYSIS. (4 Credits)
Identification and measurement of production components in harvesting systems. Methods analysis, productivity improvement and engineering economics. Report writing skills emphasized. Lec/lab.
Prerequisites: FE 102 with C- or better and (FE 370 [C] or FE 371 [C])
Recommended: Basic statistics

FE 444. FOREST REMOTE SENSING AND PHOTOGRAMMETRY. (4 Credits)
Introduction to spectral reflectance, photogrammetry, image analysis, and point clouds. Fundamentals of data acquisition with passive and active sensors installed on airborne and spaceborne platforms. Radar and lidar in forestry. Lec/lab.
Prerequisites: FE 257 with C or better and (MTH 112 [C] or MTH 241 [C] or MTH 251 [C] or MTH 251H [C] or MTH 252 [C] or MTH 252H [C]) and (PH 201 [C] or PH 211 [C])

FE 456. *INTERNATIONAL FORESTRY. (3 Credits)
An introduction to the biological, physical, and sociological factors that shape the world’s forests and the activities used to manage those forests. What influence these factors have on forest policies, practices, and outcomes. CROSSTagged as FE 456/FOR 456. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FOR 456
Recommended: Introductory course in biology.

FE 457. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intermittent scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSTagged as FE 457/FOR 457 and FE 557/FOR 557.
Prerequisites: AREC 351 with C or better or FOR 330 with C or better
Equivalent to: FOR 457

FE 459. FOREST MANAGEMENT PLANNING AND DESIGN I. (4 Credits)
Integration of environmental, economic, and social aspects of forestry in management planning. Development of strategic and tactical plans using diverse data types and sources. Senior capstone class projects. Lec/lab. CROSSTagged as FE 459/FOR 459.
Prerequisites: FE 457 with C or better or FOR 457 with C or better
Equivalent to: FOR 459

FE 460. *FOREST OPERATIONS REGULATIONS AND POLICY ISSUES. (3 Credits)
Reviews regulations and other policies that affect timber harvesting and other forest practices, particularly policies that address concerns of environment, safety, employment and transportation. Discusses how such rules and other policies evolve, including the role of public perceptions, forestry professionals and other key policy players. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

FE 469. FOREST MANAGEMENT PLANNING AND DESIGN II. (4 Credits)
A team-based, project-centric course for integrated timber harvest planning. Establish tactical and operational planning goals and constraints, identify feasible harvesting and transportation systems, and design harvest units to meet objectives and constraints. Lec/lab. CROSSTagged as FE 469/FOR 469.
Prerequisites: FE 459 with C or better or FOR 459 with C or better
Equivalent to: FOR 469

FE 470. LOGGING MECHANICS. (4 Credits)
Relationship of torque, power, and thrust to the operation of cable and ground-based harvesting systems. On-highway and off-highway heavy truck performance.
Prerequisites: (ENGR 211 with D- or better or ENGR 211H with D- or better) and ENGR 213 [D] and FE 371 [C-]

FE 471. HARVESTING MANAGEMENT. (3 Credits)
Verification of harvesting assessment plans and operational planning/field layout. Practical logging skills related to harvest planning, operations monitoring, and designing worker training programs. Lec/lab.
Recommended: FE 371 and FE 470

FE 472. MECHANIZED HARVESTING AND SIMULATION. (2 Credits)
Study of harvesters, forwarders, and processing of timber for maximizing stand value. The use of a harvesting simulator will provide for a hands-on approach to learning.
Recommended: FOR 321

FE 479. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSTagged as CE 479/FE 479 and CE 579/FE 579.
Prerequisites: CE 373 with C or better or FE 316 with C or better
Equivalent to: CE 479

FE 480. FOREST ENGINEERING PRACTICE AND PROFESSIONALISM. (1 Credit)
Personal and professional skills, attributes, and issues in forest engineering practice. Includes topics such as ethics, land stewardship, media relations and risk management.

FE 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 8 credits.

FE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

FE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 507. SEMINAR. (1-16 Credits)
Subject matter as required by graduate programs.
This course is repeatable for 16 credits.

FE 515. FOREST ROAD ENGINEERING. (3 Credits)
Location, surveying, design, cost estimation, and construction practices for forest roads. Lecture on principles, and laboratory field practice in locating, surveying, designing, and cost estimating.
Recommended: Basic surveying

FE 516. FOREST ROAD SYSTEM MANAGEMENT. (4 Credits)
Structural characteristics of bridges, load rating, structural design of culverts, aggregate testing and evaluation, environmental assessment of forest road systems, road maintenance cycles and management.
Recommended: FE 415 or FE 515
FE 523. UNMANNED AIRCRAFT SYSTEM REMOTE SENSING. (3 Credits)
Unmanned Aircraft System (UAS) Geomatics presents techniques in UAS design and applications for remote sensing measurements of both natural and constructed landscapes.
Prerequisites: GEOG 580 with C or better or GEOG 581 with C or better or GEO 544 with C or better or GEO 566 with C or better or OC 678 with C or better

FE 530. WATERSHED PROCESSES. (4 Credits)
effects of land use practices on the physical hydrology (interception, infiltration, evapotranspiration, subsurface flow and surface runoff, water yields, and peak flows) of forested watersheds. Surface erosion, mass soil movements, stream temperatures, nutrient levels and effects of management activities upon riparian systems; forest practice rules. Lec/lab.
Recommended: BEE 512 or introductory hydrology course

FE 532. FOREST HYDROLOGY. (4 Credits)
Physical hydrology, erosion processes, and attributes of stream ecosystems for forested watersheds. Material can be widely applied, but is applicable primarily to the humid, temperate rainforests of the Pacific Northwest. Lec/rec.
Recommended: BEE 512 or introductory hydrology course

FE 536. FOREST DISTURBANCE HYDROLOGY. (3 Credits)
Impacts of forest disturbance, including timber harvest, wildfire, insect outbreaks, and low frequency storms and floods on watershed hydrology and streams.
Recommended: FE 434

FE 540. FOREST OPERATIONS ANALYSIS. (4 Credits)
Identification and measurement of production components in harvesting systems. Methods analysis, productivity improvement and engineering economics. Report writing skills emphasized. Lec/lab.
Recommended: FE 102 and (FE 370 or FE 371) and basic statistics.

FE 544. FOREST REMOTE SENSING AND PHOTOGRAMMETRY. (4 Credits)
Introduction to spectral reflectance, photogrammetry, image analysis, and point clouds. Fundamentals of data acquisition with passive and active sensors installed on airborne and spaceborne platforms. Radar and lidar in forestry. Lec/lab.
Recommended: FE 257 and (MTH 112 or MTH 241 or MTH 251 or MTH 251H or MTH 252 or MTH 252H)

FE 545. SEDIMENT TRANSPORT. (4 Credits)
Principles of sediment erosion, transportation and deposition in rivers, reservoirs, and estuaries; measurement, analysis, and computational techniques. Offered even years in winter term. CROSSLISTED as BEE 545/FE 545.
Equivalent to: BEE 545
Recommended: CE 313 or FE 330

FE 552. FOREST TRANSPORTATION SYSTEMS. (4 Credits)
Analysis of interactions between harvesting and road systems. Advanced topics in road and landing spacing, determination of road standards, analysis of logging road networks, transfer and sort yard facility location. Simultaneous resource scheduling and transportation planning.
Recommended: FE 102 and (FE 440 or FE 540)

FE 555. FOREST SUPPLY CHAIN MGMT. (3 Credits)
Develop and implement operational planning and logistics scheduling systems to manage a forestry supply chain for typical forest organizations in the Pacific Northwest. Once developed, these supply chain plans will be implemented using simulation software that will allow students to view the results of their forest operations plans.
Recommended: (CS 151 or FE 102) and FE 357 and FOR 457

FE 557. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Equivalent to: FOR 557
Recommended: AREC 351 or FOR 330

FE 560. FOREST OPERATIONS REGULATIONS AND POLICY ISSUES. (3 Credits)
Reviews regulations and other policies that affect timber harvesting and other forest practices, particularly policies that address concerns of environment, safety, employment and transportation. Discusses how such rules and other policies evolve, including the role of public perceptions, forestry professionals and other key policy players.

FE 570. LOGGING MECHANICS. (4 Credits)
Relationship of torque, power, and thrust to the operation of cable and ground-based harvesting systems. On-highway and off-highway heavy truck performance.
Recommended: ENGR 211 and ENGR 213 and FE 371

FE 571. HARVESTING MANAGEMENT. (3 Credits)
Verification of harvesting assessment plans and operational planning/field layout. Practical logging skills related to harvest planning, operations monitoring, and designing worker training programs.
Recommended: FE 371 and FE 470

FE 579. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSLISTED as CE 479/FE 479 and CE 579/FE 579.
Equivalent to: CE 579
Recommended: CE 373 or FE 316

FE 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

FE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 607. SEMINAR. (1-16 Credits)
Subject matter is required by graduate programs.
This course is repeatable for 16 credits.

FE 640. SPECIAL TOPICS IN FOREST ENGINEERING. (1-3 Credits)
Recent advances in logging engineering, forest engineering, and forest operations. Content will vary with instructor. May be retaken for credit.
This course is repeatable for 99 credits.
Forestry

FOR 111. INTRODUCTION TO FORESTRY. (3 Credits)
Forest resources in the world; forests and human well-being; where and how forests grow; environmental and human values; products, characteristics, and uses; basic elements of use, planning and management. Interpretation of forestry literature; professional origins in the U.S. Field trips required.
Equivalent to: F 111

FOR 112. COMPUTING APPLICATIONS IN FORESTRY. (3 Credits)
An overview of computing applications used in all aspects of forestry work, but largely focused on development of intermediate and advanced spreadsheet skills using Microsoft Excel (e.g., complex formulas and functions, charting, and pivot tables). Additionally, the course rounds out essential skills in document formatting and presentation development.

FOR 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

FOR 206. FOREST SOILS LABORATORY FOR SOIL 205. (1 Credit)
Laboratory exercise and field trips designed to develop student competency in soil processes, description, analysis, and assessment with a particular emphasis on the role of soils in managed and unmanaged forest ecosystems. (Bacc Core Course if taken with SOIL 205)
Attributes: CPBS – Core, Pers, Biological Science; CPPS – Core, Pers, Physical Science
Corequisites: SOIL 205

FOR 208. FOREST SOILS RECITATION. (1 Credit)
Readings, exercises, discussions designed to develop student competency in forest soil processes, description, analysis, and assessment. A particular emphasis will be placed on the role of soils in managed and unmanaged forest ecosystems.
Recommended: An introductory soils course.

FOR 307. JUNIOR SEMINAR. (1 Credit)
College is the time to develop the skills necessary for the transition between academics and career. In conjunction with the expertise already available on campus, this course will guide students through career planning, exploration, placement, and employer expectations.
CROSSLISTED as FE 307/FOR 307.
Equivalent to: FE 307

FOR 312. FOREST FIELD SCHOOL. (2 Credits)
A hands-on experience in the major aspects of forestry, including regeneration surveys, silviculture, cruising, recreation, forest disturbances, logging site and mill visits, east and west of the Cascades Range. CROSSLISTED as FE 312/FOR 312.
Equivalent to: FE 312

FOR 321. FOREST MENSURATION. (5 Credits)
Theory and practice of sampling and cruising techniques; stratified and nonstratified sampling systems with fixed plots, variable plots, and 3-P designs.
Prerequisites: (FOR 141 with C or better or FES 141 with C or better or FOR 241 with C or better or FES 241 with C or better) and FE 208 [C] and FE 209 [C] and (MTH 241 [C] or MTH 245 [C] or MTH 251 [C] or MTH 251H [C]) and (ST 201 [C] or ST 314 [C] or ST 314H [C] or ST 351 [C] or ST 351H [C])
Equivalent to: F 321

FOR 322. FOREST MODELS. (3 Credits)
Introduction to static and dynamic forest models: defining what they are, how they might be used, and, in general terms, how they are developed.
Prerequisites: FOR 321 with C- or better and MTH 241 [D] and (ST 201 [D-] or ST 351 [D-])
Equivalent to: F 322

FOR 329. FOREST RESOURCE ECONOMICS I. (4 Credits)
Forest products markets, appraisal, rotation, thinning, uneven-aged management and forest regulation. Economics of timber management and harvest scheduling.
Prerequisites: ST 201 with D- or better or ST 351 with D- or better
Equivalent to: FOR 331

FOR 330. FOREST RESOURCE ECONOMICS II. (4 Credits)
Basic arithmetic of interest and capital budgeting. Basic wood products markets. Forest resource markets and market failures. Nonmarket valuation and multiple-use forestry. Impacts of forest management and policy decisions on forest resource use. Lec/lab.
Prerequisites: (AEC 250 with C or better or AREC 250 with C or better or ECON 201 with C or better or ECON 201H with C or better) and (MTH 241 [C] or MTH 245 [C] or MTH 251 [C] or MTH 251H [C] or MTH 252 [C] or MTH 252H [C])
Equivalent to: FOR 430

FOR 331. FOREST RESOURCE ECONOMICS III. (4 Credits)
Forest products markets, appraisal, rotation, thinning, uneven-aged management and forest regulation. Economics of timber management and harvest scheduling.
Prerequisites: ST 201 with C or better or ST 351 with C or better
Equivalent to: FOR 329
Recommended: FOR 330

FOR 346. TOPICS IN WILDLAND FIRE. (3 Credits)
An interdisciplinary survey of concepts relating to fire science, ecology, management, and policy. Includes case studies of several representative ecosystems, ranging from west- and eastside forests of the Pacific Northwest to shrub steppe ecosystems of the Intermountain West and chaparral ecosystems of southern California. Distance and campus-based delivery using videos, website, and discussion.
Equivalent to: FW 346, RNG 346
Recommended: Coursework in forest biology or ecology (eg. FOR 240 or FES 240 or FES 341)

FOR 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: FOR 399H

FOR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: FOR 399
This course is repeatable for 16 credits.

FOR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: F 401
This course is repeatable for 16 credits.

FOR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FOR 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FOR 406. PROJECTS. (1-16 Credits)
Section 4: Integrated Projects, Graded.
Equivalent to: F 406, FRR 406
This course is repeatable for 16 credits.
FOR 407. SEMINAR. (1-16 Credits)
Equivalent to: F 407, FRR 407
This course is repeatable for 16 credits.

FOR 408. WORKSHOP. (1-3 Credits)
Equivalent to: FRR 408
This course is repeatable for 16 credits.

FOR 410. INTERNSHIP. (1-16 Credits)
Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. Graded P/N.
Equivalent to: FRR 410
This course is repeatable for 16 credits.

FOR 413. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 413/FOR 413.
Prerequisites: BI 204 with C or better or BL 212 with C or better or BI 212H with C or better or BI 213 with C or better or BI 213H with C or better
Equivalent to: BOT 413

FOR 417. ADVANCED FOREST SOILS. (4 Credits)
Synthesize current information on fundamental properties and processes of forest soils with emphasis on applications to silviculture, soil conservation, and sustainable management of forested ecosystems. Lec/lab.
Prerequisites: SOIL 205 with C- or better and (CH 231 with C- or better or CH 231H with C- or better) and (CH 261 [C] or CH 261H [C]) or CH 201 [C] and (MTH 241 [C] or MTH 251 [C-] or MTH 251H [C-] or MTH 252 [C-] or MTH 252H [C-])
Equivalent to: FOR 417X

FOR 429. INTEGRATED PRESCRIPTIONS. (3 Credits)
Using an actual stand and real data, we will cultivate systematic approaches for: 1) characterizing site conditions and limiting factors; 2) harmonizing multiple management objectives; 3) modeling long-term responses to silvicultural manipulations; 4) assessing environmental impacts; 5) building public acceptance; and 6) communicating alternatives and rationales for decisions. This expanded course will allow a deeper project experience and more integration among the faculty in the co-requisite course, and providing the lab component of three other inter-related forest management courses.
Prerequisites: (FOR 240 with C- or better or FOR 240 with C- or better) and FOR 321 [C-]
Corequisites: FOR 443

FOR 436. WILDLAND FIRE SCIENCE AND MANAGEMENT. (4 Credits)
Principles and applications of fire as a natural resource management tool; the role of fire in conservation management, restoration, and preservation of ecosystems. Covers basic techniques and current research used to describe fire behavior and spread, fuels and fuel manipulation, and fire effects on the biota. Focus will be on fire as a natural process in ecosystem dynamics. Lec/lab.
Equivalent to: FW 436, RNG 436

FOR 441. SILVICULTURE PRINCIPLES. (4 Credits)
Nursery operation, vegetation management, herbivores, fire, seeding and planting techniques. Introduction to principles and techniques involving vegetation control, thinning, fertilizing, and harvesting. Environmental considerations related to forest stand treatments. Lec/lab.
Prerequisites: (FES 240 with C or better or FOR 240 with C or better) and (FES 141 [C] or FES 241 [C])

FOR 442. SILVICULTURE REFORESTATION. (4 Credits)
Silvicultural principles and practices needed to successfully regenerate forestlands in North America. Topics include artificial and natural regeneration, genetic improvement, seed orchards, forest tree nurseries, site preparation, seedling quality and handling, vegetation management, animal damage protection, early stand management, and ecological and ecophysiological considerations. Emphasis is placed on regeneration methods applied to plantations in western Oregon. Field trips required.
Prerequisites: SOIL 205 with C or better and (FES 240 [C] or FES 240H [C] or FOR 240 [C])
Corequisites: FOR 443

FOR 443. SILVICULTURAL PRACTICES. (4 Credits)
Manipulation of forest stand structure and dynamics to meet various resource management objectives. Covers key concepts and practices associated with vegetation control, thinning, fertilization, even-aged and uneven-aged regeneration systems including social and environmental considerations associated with treatments. Two-day field trip required. Lec/lab.
Prerequisites: (FES 240 with C or better or FOR 240H with C or better or FOR 240 with C or better) and FOR 321 [C]
Corequisites: FOR 442

FOR 456. *INTERNATIONAL FORESTRY. (3 Credits)
An introduction to the biological, physical, and sociological factors that shape the world's forests and the activities used to manage those forests. What influence these factors have on forest policies, practices, and outcomes. CROSSLISTED as FE 456/FOR 456. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FE 456
Recommended: Introductory course in biology.

FOR 457. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Prerequisites: AREC 351 with C or better or FOR 330 with C or better
Equivalent to: FE 457
FOR 459. FOREST MANAGEMENT PLANNING AND DESIGN I. (4 Credits)
Integration of environmental, economic, and social aspects of forestry in management planning. Development of strategic and tactical plans using diverse data types and sources. Senior capstone class projects. Lec/lab.
CROSSLISTED as FE 459/FOR 459.
Prerequisites: FE 457 with C or better or FOR 457 with C or better
Equivalent to: FE 459
FOR 460. FOREST POLICY. (4 Credits)
Policy formulation and analysis for forest resources. Consideration of policy affecting land management approaches to planning, management, and social and economic development. Major forestry policy areas covered include outdoor recreation, range, timber, wilderness, and wildlife and fish. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
FOR 462. NATURAL RESOURCE POLICY AND LAW. (3 Credits)
First of two offerings designed to provide an introduction to current environmental and natural resource law issues and disputes for students who will have to meet, consult, and work with lawyers throughout their professional career. Focus is on mechanisms governing resource allocation within the constraints of private property rights. Emphasis is placed on the federal Endangered Species Act and its relation to water allocation and public trust doctrines. Students will also gain a broad understanding of regulatory .
FOR 469. FOREST MANAGEMENT PLANNING AND DESIGN II. (4 Credits)
A team-based, project-centric course for integrated timber harvest planning. Establish tactical and operational planning goals and constraints, identify feasible harvesting and transportation systems, and design harvest units to meet objectives and constraints. Major forestry policy areas covered include outdoor recreation, range, timber, wilderness, and wildlife and fish. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
FOR 499. SPECIAL TOPICS. (0-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. Section 8: Social aspects of natural resource management (3 credits) graded.
This course is repeatable for 16 credits.
FOR 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: F 501
This course is repeatable for 16 credits.
FOR 503. THESIS. (1-16 Credits)
Equivalent to: F 503
This course is repeatable for 999 credits.
FOR 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: F 505, FRR 505
This course is repeatable for 16 credits.
FOR 506. PROJECTS. (1-16 Credits)
Equivalent to: F 506
This course is repeatable for 16 credits.
FOR 507. SEMINAR. (1-16 Credits)
Equivalent to: F 507, FRR 507
This course is repeatable for 16 credits.
FOR 508. WORKSHOP. (1-3 Credits)
This course is repeatable for 16 credits.
FOR 510. INTERNSHIP. (1-9 Credits)
This course is repeatable for 16 credits.
FOR 513. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 513/FOR 513.
Equivalent to: BOT 513
Recommended: BI 204 or BI 212 or BI 212H or BI 213 or BI 213H
FOR 517. ADVANCED FOREST SOILS. (4 Credits)
Synthesize current information on fundamental properties and processes of forest soils with emphasis on applications to silviculture, soil conservation, and sustainable management of forested ecosystems. Lec/lab.
Recommended: SOIL 205 and (((CH 231 or CH 231H) and (CH 261 or CH 261H)) or CH 201) and (MTH 241 or MTH 251 or MTH 251H or MTH 252 or MTH 252H) all with a minimum grade of C-
FOR 518. MANAGING FOREST NUTRITION. (3 Credits)
Synthesize current information on nutrient limitations of forest productivity, long-term forest productivity, and mitigating and managing forest nutrition with emphasis on forests of the Pacific Northwest.
FOR 520. GEOSPATIAL DATA ANALYSIS WITH MATLAB. (3 Credits)
An introduction into analysis of spatial and other data using Matlab. The course will provide a practical introduction and is designed as a hands-on learning experience.
Equivalent to: F 520
FOR 524. FOREST BIOMETRICS. (3 Credits)
Advanced topics in forest biometrics, including measurement of forest structure and dynamics, application of sampling theory and methods, and statistical techniques for interpreting forestry data.
Equivalent to: F 524
Recommended: FOR 322 and ST 511
FOR 525. FOREST MODELING. (3 Credits)
Examination of regression techniques and assumptions used to develop static and dynamic equations of tree and stand attributes.
Prerequisites: ST 552 with C or better
Equivalent to: F 525
FOR 528. PROFESSIONAL COMMUNICATION AND ETHICS. (2 Credits)
Conventions of written and oral communication in forestry and related disciplines including basic narrative development. Exploration of environmental, professional, and research ethics, and the role they play in effective communication with multiple stakeholders.
FOR 531. ECONOMICS AND POLICY OF FOREST WILDLAND FIRE. (3 Credits)
General overview of the history of fire and the interaction of people with fire on forested landscapes. Forest fire policy history and current issues in the U.S. Basic legal concepts relevant to forest fire policy. An economic framework for understanding spatial externalities, decision-making under certainty, institutional economics, and incentives.
Recommended: FOR 330 or AEC 351 or AEC 352 or ECON 352
FOR 534. ECONOMICS OF THE FOREST RESOURCE. (3 Credits)
Topics include optimal stand and forest management for timber production, economics of ecosystem services (e.g. recreation, biodiversity, carbon sequestration, water quality and regulation), non-market valuation methods, management under risk and uncertainty, discounting, intergenerational equity, sustainability, international trade and other global issues.
Recommended: FOR 330 and FOR 331
FOR 536. WILDLAND FIRE SCIENCE AND MANAGEMENT. (4 Credits)
Principles and applications of fire as a natural resource management tool; the role of fire in conservation management, restoration, and preservation of ecosystems. Covers basic techniques and current research used to describe fire behavior and spread, fuels and fuel manipulation, and fire effects on the biota. Focus will be on fire as a natural process in ecosystem dynamics. Lec/lab.
Equivalent to: FW 536, RNG 536

FOR 542. INTERNATIONAL INTENSIVE SILVICULTURE. (2 Credits)
Operational and ecological aspects of intensive silvicultural management of planted forests around the world. Guest speakers in different countries will describe the type of silvicultural management that is carried out in the speaker’s country from species and genetic selection, to harvest and rotation length, including site preparation and planting techniques. Emphasis on comparing silvicultural practices in each country to the management of plantations in western Oregon.

FOR 543. SILVICULTURAL PRACTICES. (5 Credits)
Manipulation of immature and mature forest stands for various resource management objectives. Principles and techniques involving vegetation control, thinning, fertilizing, and harvesting. Environmental considerations related to stand treatments. Two-day field trips required.
Recommended: (FOR 240 or FES 240) and FOR 321 and concurrent enrollment in FOR 429

FOR 549. SILVICULTURAL INFLUENCES ON FOREST ECOSYSTEM DYNAMICS. (3 Credits)
Fundamental biological and ecological principles for the design and implementation of silvicultural regimes that achieve a wide diversity of forest ecosystem management objectives.
Recommended: Undergraduate course in silviculture and in forest mensuration.

FOR 550. SUSTAINABLE FOREST MANAGEMENT. (3 Credits)
Sustainable forestry as part of the global sustainability movement. History of sustainability and its influence on decision-making in forest management. Current dimensions of sustainability: forest certification, climate change, role of environmental ethics, biodiversity conservation, maintenance of long-term site productivity, conservation of soil and water resources, roles of social institutions, and links to concerns for social justice.

FOR 557. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Equivalent to: FE 557
Recommended: AREC 351 or FOR 330

FOR 561. FOREST POLICY ANALYSIS. (3 Credits)
Basic elements of forest policy problems, including resource allocation and efficiency, distribution, and interpersonal equity, taxation, regulation, and control, and planning and uncertainty. Emphasis on policy and analysis and its uses in policy decision.

FOR 562. NATURAL RESOURCE POLICY AND LAW. (3 Credits)
First of two offerings designed to provide an introduction to current environmental and natural resource law issues and disputes for students who will have to meet, consult, and work with lawyers throughout their professional career. Focus is on mechanisms governing resource allocation within the constraints of private property rights. Emphasis is placed on the federal Endangered Species Act and its relation to water allocation and public trust doctrines. Students will also gain a broad understanding of regulatory.

FOR 563. ENVIRONMENTAL POLICY AND LAW INTERACTIONS. (3 Credits)
Second of two offerings designed to provide an introduction to current environmental and natural resource law issues and disputes for students who will have to meet, consult, and work with lawyers throughout their professional career. Focus is on the arena of regulatory environmental laws. Environmental torts, regulation of point and non-point source pollution under the federal Clean Water Act, wetlands protection, and laws governing agricultural and forest practices will be examined as examples of regulatory frameworks for achieving resource protection. Students will be exposed to the basic framework of federal laws regulating air and hazardous waste pollutants.

FOR 599. SPECIAL TOPICS. (1-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. Section 8: Social aspects of natural resource management (3 credits) graded.
This course is repeatable for 16 credits.

FOR 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: F 601
This course is repeatable for 16 credits.

FOR 603. THESIS. (1-16 Credits)
Equivalent to: F 603
This course is repeatable for 999 credits.

FOR 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: F 605
This course is repeatable for 16 credits.

FOR 606. PROJECTS. (1-16 Credits)
Equivalent to: F 606
This course is repeatable for 16 credits.

FOR 607. SEMINAR. (1-16 Credits)
Equivalent to: F 607
This course is repeatable for 16 credits.

FOR 699. SPECIAL TOPICS. (1-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit.
This course is repeatable for 16 credits.

FOR 808. WORKSHOP. (1-9 Credits)
This course is repeatable for 16 credits.

Forest Engineering - Civil Engineering
Undergraduate Major (BS, HBS)
The Forest Engineering-Civil Engineering program results in a BS degree in Forest Engineering and a BS degree in Civil Engineering. The BS degree in Forest Engineering and the BS degree in Civil Engineering are both
Pre-Professional Program
Admission to the pre-professional program requires that a student is admitted as a degree-seeking undergraduate or post-baccalaureate level student at Oregon State University. Courses included in the first and sophomore years comprise a pre-professional program of study that produces a solid foundation for professional program studies at the junior, senior, and advanced degree levels. The pre-professional program may be taken at Oregon State University or at any accredited college or university that offers equivalent courses transferable to OSU in conjunction with foundation forestry available via OSU Ecampus.

Professional Program
Students must be admitted to the professional forest engineering program following completion of the pre-professional forest engineering course work in order to progress to the junior year in forest engineering. Students in the double degree program must also be admitted to the College of Engineering professional program prior to beginning the civil engineering junior year. Students should consult the College of Engineering for requirements of the College of Engineering professional program.

Enrollment in professional forest engineering program courses is restricted to those students who have clearly demonstrated an ability to achieve the standards required for professional studies. The number of students admitted to the program is based on available resources. Students meeting the minimum pre-forest engineering GPA of 2.25 may or may not be admitted depending on available resources.

Admission to the professional forest engineering program will be granted for students meeting the admission requirements prior to fall term of the junior year. Application for the professional program will be made at the end of winter term for the following fall term. For admission, students must earn:

1. a grade of 'C' or better in all pre-professional courses required for entry into the professional program (marked with an E). Grade repeat (replacement) policy will follow OSU Academic Regulation #20.
2. a minimum GPA of 2.25 based on the pre-professional courses (or transfer equivalents) satisfactorily completed.

Students who have completed their pre-professional studies at a college or university other than Oregon State University must apply both to the OSU Office of Admissions for admission to OSU as a degree-seeking undergraduate or post-baccalaureate level student and to the College of Forestry for admission to the professional program. Application forms for the forest engineering professional program and information on policies and programs are available from the College of Forestry.

Students who have not satisfactorily completed all of the pre-professional courses when they apply may be provisionally accepted. Final acceptance is contingent on completion of any remaining pre-professional course work with grade of 'C' or better by the end of the summer term prior to entrance into the professional program. Students who receive provisional acceptance and then fail to attain a grade of 'C' or better in remaining pre-professional course work prior to the beginning of fall term will be re-directed to the pre-professional forestry program.

All required courses for admission to the professional program must be completed before entering the professional program. Students may only enter the professional program in the fall term of each academic year.

The professional forest engineering program begins with Forestry Field School prior to fall term of the professional program.

Major Code: 381

Pre-Forest Engineering-Civil Engineering Major Code: 361

Grade standards for the pre-professional program as listed in the program description apply.

All students pursuing the BS in Forest Engineering-Civil Engineering:

1. must earn grades of 'C' or better in all required professional courses, or approved substitutions for majors and options, and
2. must maintain a 2.0 GPA in all major course work, and courses used for substitution of required courses.

College of Engineering specific requirements:

1. Must earn grades of "C" or better in all required civil engineering major courses in the pre-professional and professional core.
2. Must maintain a cumulative 2.25 GPA in all civil engineering major course work and an overall OSU GPA of 2.25.

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<td>FOR 321</td>
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<td>FOR 330</td>
<td>FOREST RESOURCE ECONOMICS I</td>
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<tr>
<td>FOR 331</td>
<td>FOREST RESOURCE ECONOMICS II</td>
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<tr>
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Fourth Year

<table>
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<tbody>
<tr>
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<tr>
<td>CE 311</td>
<td>FLUID MECHANICS</td>
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<td>CE 313</td>
<td>HYDRAULIC ENGINEERING</td>
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<tr>
<td>CE 361</td>
<td>SURVEYING THEORY</td>
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<tr>
<td>CE 381</td>
<td>STRUCTURAL THEORY I</td>
<td>4</td>
</tr>
<tr>
<td>CE 382</td>
<td>STRUCTURAL THEORY II</td>
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</tr>
<tr>
<td>CE 392</td>
<td>INTRODUCTION TO HIGHWAY ENGINEERING</td>
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<td>CE 481</td>
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<td>ENGR 201</td>
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<td>ENVE 321</td>
<td>ENVIRONMENTAL ENGINEERING FUNDAMENTALS</td>
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| Total Hours   |                                                        | 47    |

Fifth Year

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<td>DESIGN OF STEEL STRUCTURES</td>
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<td>CE 418</td>
<td>CIVIL ENGINEERING PROFESSIONAL PRACTICE</td>
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<tr>
<td>CE 419</td>
<td>CIVIL INFRASTRUCTURE DESIGN</td>
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<td>CE 491</td>
<td>TRANSPORTATION ENGINEERING</td>
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<td>FOREST ROAD ENGINEERING</td>
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<td>FE 416</td>
<td>FOREST ROAD SYSTEM MANAGEMENT</td>
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<td>FE 444</td>
<td>FOREST REMOTE SENSING AND PHOTOGRAMMETRY</td>
<td>4</td>
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<tr>
<td>FE 456/FOR 456</td>
<td>INTERNATIONAL FORESTRY (or other CGI Bacc Core Course)</td>
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<tr>
<td>FE 457/FOR 457</td>
<td>TECHNIQUES FOR FOREST RESOURCE ANALYSIS</td>
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<tr>
<td>FE 459/FOR 459</td>
<td>FOREST MANAGEMENT PLANNING AND DESIGN</td>
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| Total Hours   |                                                        | 48    |

Second Year

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<tbody>
<tr>
<td>CCE 201</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>FE 208</td>
<td>FOREST SURVEYING</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 211</td>
<td>STATICS</td>
<td>3</td>
</tr>
<tr>
<td>MTH 306</td>
<td>MATRIX AND POWER SERIES METHODS</td>
<td>4</td>
</tr>
<tr>
<td>PH 212</td>
<td>GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
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</table>

| Total Hours   |                                                        | 18    |

Winter

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 213</td>
<td>STRENGTH OF MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>FE 257</td>
<td>GIS AND FOREST ENGINEERING APPLICATIONS</td>
<td>3</td>
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</tbody>
</table>

Bacc Core Course

| Hours         |                                                        | 3     |

Third Year

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FE 101</td>
<td>INTRODUCTION TO FOREST ENGINEERING FIELD SCHOOL</td>
<td>2</td>
</tr>
<tr>
<td>MTH 251</td>
<td>DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>ENGLISH COMPOSITION</td>
<td>3</td>
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</table>

| Total Hours   |                                                        | 14    |

First Year

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<th>Hours</th>
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<tr>
<td>CCE 101</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING ORIENTATION</td>
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</tr>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
</tr>
<tr>
<td>FE 101</td>
<td>INTRODUCTION TO FOREST ENGINEERING FIELD SCHOOL</td>
<td>2</td>
</tr>
<tr>
<td>MTH 251</td>
<td>DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>ENGLISH COMPOSITION</td>
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</table>

| Total Hours   |                                                        | 14    |

Winter

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CH 202</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>FE 102</td>
<td>FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY</td>
<td>3</td>
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<tr>
<td>HHS 231</td>
<td>LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>LIFETIME FITNESS (or any PAC course)</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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| Total Hours   |                                                        | 18-19 |

Spring

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<td>PUBLIC SPEAKING</td>
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<td>or COMM 114</td>
<td>ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>FES 240</td>
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<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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<tr>
<td>PH 211</td>
<td>GENERAL PHYSICS WITH CALCULUS</td>
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| Total Hours   |                                                        | 16    |

Second Year

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<td>CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN</td>
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<td>FE 208</td>
<td>FOREST SURVEYING</td>
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<td>ENGR 211</td>
<td>STATICS</td>
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<tr>
<td>MTH 306</td>
<td>MATRIX AND POWER SERIES METHODS</td>
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<tr>
<td>PH 212</td>
<td>GENERAL PHYSICS WITH CALCULUS</td>
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| Total Hours   |                                                        | 18    |

Winter

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<tr>
<th>Course</th>
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<td>ENGR 213</td>
<td>STRENGTH OF MATERIALS</td>
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<td>GIS AND FOREST ENGINEERING APPLICATIONS</td>
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<p>| Total Hours   |                                                        | 3     |</p>
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<td>FOR 441</td>
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<td>CE 361</td>
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<td>STRUCTURAL THEORY I</td>
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<tr>
<td></td>
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<td>Winter</td>
<td>CE 313</td>
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<td>CE 382</td>
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<td>CE 392</td>
<td>INTRODUCTION TO HIGHWAY ENGINEERING</td>
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<td>FE 444</td>
<td>FOREST REMOTE SENSING AND PHOTOGRAMMETRY</td>
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<td></td>
<td>FE 457/FOR 457</td>
<td>TECHNIQUES FOR FOREST RESOURCE ANALYSIS</td>
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<td>GEOG 300 or FW 350</td>
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<td>Winter</td>
<td>CE 418</td>
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<td>FE 415</td>
<td>FOREST ROAD ENGINEERING</td>
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**Forest Engineering Undergraduate Major (BS, HBS)**

The Forest Engineering Undergraduate Program provides an engineering education within a strong forestry context. The program is founded on fundamental principles of forest science and engineering science. Forest Engineering program objectives are to prepare graduates to plan and implement complex forestry and natural resource operations that help meet global demands for wood products while sustaining water, habitat, and other forest resources. It provides ‘work-ready’ graduates for entry into the diverse professional field of forest engineering. Early career accomplishments include harvest unit design, forest road location and design, contract inspection and administration, cost analysis, and forest transportation management. Mid-career accomplishments commonly expand to involve aspects of engineering management, including planning and budgeting, supervision, wood supply procurement, harvest and road design reviews, and scheduling and controlling forest operations.

**Program Educational Objectives – Forest Engineering**

Specifically, the Forest Engineering Undergraduate Program provides fundamental coverage of the following:

- Fundamental engineering and forestry principles
- Physical and biological aspects of soil and water resources
- Surveying and measurement of land and forest resources
- Analysis and design of the forest transportation system
- Analysis and design of harvesting operations
- Economics and operational planning principles

Integration of these topics enables forest engineering graduates to develop and manage safe, economical, and environmentally sound forest operations. Design experiences that integrate the topics listed above and steadily build on previous course material are distributed throughout the upper-division portion of the program. The Forest Engineering capstone sequence during the senior year provides an opportunity for students to bring together all the topics from the curriculum in a project framework that includes the field and office engineering tasks associated with the planning and design of forest operations. The capstone sequence is integrated with the Forestry capstone sequence to provide realistic interdisciplinary planning and design experience.

Forest engineering graduates are employed by private forestry firms, public forestry agencies, logging and construction companies,
Some graduates establish their own consulting businesses after a few years of field experience. Career progression following graduation can be quite varied. Some graduates gravitate toward technical positions while others move quickly toward management of harvesting and other forest operations, or more broadly defined management of the forest land base.

### Student Outcomes for the Forest Engineering Program

The Bachelor of Science and Honors Bachelor of Science degrees in Forest Engineering can be earned through completion of the Forest Engineering program or the Forest Engineering-Civil Engineering double degree program. The BS and HBS degrees in Forest Engineering and the BS and HBS Forest Engineering-Civil Engineering dual degrees are accredited by the Engineering Accreditation Commission of ABET, [http://www.ABET.org](http://www.ABET.org). The BS in Forest Engineering is also accredited by the Society of American Foresters. The OSU Forest Engineering program prepares its graduates to achieve the Program Educational Objectives above several years into their careers. This is achieved by having students able to perform the following on graduation, well preparing them for active immediate and lifelong service in the profession:

1. An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
8. Operational understanding of forest ecology and silviculture.
9. Understanding of soil and water resources.
10. Ability to make land and resource measurements.
11. Ability to design the transportation infrastructure.
12. Ability to plan and manage economic and safe forest operations.
13. Understanding of economics and valuation.

Completion of the five-year, double-degree Forest Engineering-Civil Engineering program results in a BS in Forest Engineering and a BS in Civil Engineering, offered by the School of Civil and Construction Engineering. The BS and HBS degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, [http://www.ABET.org](http://www.ABET.org). A more detailed explanation of the design experience and design course sequences is contained in the 'Forest Engineering Advising Guide', which may be viewed on the department's website (https://www.forestry.oregonstate.edu/sites/default/files/upload_files/FE%20Advising%20Guide%2019%2020.pdf).

Forest engineering is a licensed profession in the state of Oregon. The BS in Forest Engineering meets the administrative rules established by the Oregon State Board of Examiners for Engineering and Land Surveying (OSBEELS) as evidence of adequate preparation for the Fundamentals of Engineering Examination, the first of two examinations required for professional engineering licensing. The BS in Forest Engineering, with the completion of appropriate program electives, also meets the OSBEELS administrative rules for evidence of adequate preparation for the Fundamentals of Land Surveying Examination, the first of two examinations required for professional land surveyor licensing.

### Major Code: 380

#### Pre-Forest Engineering Major Code: 825

Grade standards for the professional program as listed in the program description apply.

All students pursuing the BS in Forest Engineering:

1. must earn grades of "C" or better in all courses required for the major;
2. must maintain a 2.0 GPA in all courses required for the major;
3. total credits required for graduation is 192.

#### Course Title Hours

<table>
<thead>
<tr>
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<th>Hours</th>
</tr>
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<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
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<tr>
<td>COMM 111 or COMM 114</td>
<td>PUBLIC SPEAKING or ARGUMENT AND CRITICAL DISCOURSE</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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<tr>
<td>FE 101</td>
<td>INTRODUCTION TO FOREST ENGINEERING</td>
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<td>FE 102</td>
<td>FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY</td>
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<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
<td>3</td>
</tr>
<tr>
<td>FES 240</td>
<td>FOREST BIOLOGY</td>
<td>4</td>
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<td>HHS 231</td>
<td>LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
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<td>HHS 241</td>
<td>LIFETIME FITNESS (or any PAC course)</td>
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<td>MTH 251</td>
<td>DIFFERENTIAL CALCULUS</td>
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<td>WR 121</td>
<td>ENGLISH COMPOSITION</td>
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<td>Electives</td>
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<tbody>
<tr>
<td>CCE 201</td>
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<tr>
<td>ENGR 211</td>
<td>STATICS</td>
<td>3</td>
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<td>ENGR 212</td>
<td>DYNAMICS</td>
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<tr>
<td>ENGR 213</td>
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<td>FE 208</td>
<td>FOREST SURVEYING</td>
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</tr>
<tr>
<td>FE 257</td>
<td>GIS AND FOREST ENGINEERING APPLICATIONS</td>
<td>3</td>
</tr>
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<td>FES 241</td>
<td>DENDROLOGY</td>
<td>3</td>
</tr>
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<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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<td>SOIL 205</td>
<td>SOIL SCIENCE &amp; FOR 206</td>
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<td>PRINCIPLES OF STATISTICS</td>
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<table>
<thead>
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<tr>
<td>FE 310</td>
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### Forest Engineering Undergraduate Major (BS, HBS)

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<td>FORESTRY FIELD SCHOOL</td>
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<td>FE 315</td>
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<td>FE 316</td>
<td>SOIL MECHANICS</td>
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<tr>
<td>FE 330</td>
<td>FOREST ENGINEERING FLUID MECHANICS AND HYDRAULICS</td>
<td>3</td>
</tr>
<tr>
<td>FE 371</td>
<td>HARVESTING PROCESS ENGINEERING</td>
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<td>FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
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<td>FE 440</td>
<td>FOREST OPERATIONS ANALYSIS</td>
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<td>FE 470</td>
<td>LOGGING MECHANICS</td>
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<td>FE 471</td>
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<td>FOR 321</td>
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<td>FOR 331</td>
<td>FOREST RESOURCE ECONOMICS II</td>
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<tr>
<td>FOR 441</td>
<td>SILVICULTURE PRINCIPLES</td>
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**Electives**: 1

**Spring**

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<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>FES 240</td>
<td>*FOREST BIOLGY</td>
<td>4</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
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<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td>Electives</td>
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**Second Year**

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<tbody>
<tr>
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<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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<td>PH 212</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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**Third Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>FE 310</td>
<td>FOREST ROUTE SURVEYING</td>
<td>4</td>
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<td>FE 316</td>
<td>SOIL MECHANICS</td>
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<tr>
<td>FE 441</td>
<td>SILVICULTURE PRINCIPLES</td>
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**Fourth Year**

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>FE 444</td>
<td>FOREST REMOTE SENSING AND PHOTOGRAMMETRY</td>
<td>4</td>
</tr>
<tr>
<td>GEG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
<td>3</td>
</tr>
<tr>
<td>or FW 350</td>
<td>or *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY</td>
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<td>Bacc Core Courses</td>
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**Total Hours**: 191-193

1 Required for entry into the professional program

2 Must be selected to satisfy baccalaureate core requirements

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

### Major Code: 380

### Pre-Forest Engineering Major Code: 825

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<thead>
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<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
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<td>FE 101</td>
<td>INTRODUCTION TO FOREST ENGINEERING</td>
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<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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**Total Hours**: 15

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<th>Hours</th>
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<tbody>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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<td>FE 102</td>
<td>FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY</td>
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<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1/2</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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**Total Hours**: 15

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<td>FORESTRY FIELD SCHOOL</td>
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<td>FE 330</td>
<td>FOREST ENGINEERING FLUID MECHANICS AND HYDRAULICS</td>
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<td>FE 371</td>
<td>HARVESTING PROCESS ENGINEERING</td>
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<td>FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
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<tr>
<td>FE 440</td>
<td>FOREST OPERATIONS ANALYSIS</td>
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<td>FOR 321</td>
<td>FOREST MENSURATION</td>
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<td>FOR 331</td>
<td>FOREST RESOURCE ECONOMICS II</td>
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<td>FOR 441</td>
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**Electives**: 1

**Spring**

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<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>FES 240</td>
<td>*FOREST BIOLGY</td>
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</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
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</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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**Winter**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>ENGR 211</td>
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<td>FE 208</td>
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<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
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<td>PH 212</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td>Electives</td>
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**Third Year**

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tr>
<td>FE 310</td>
<td>FOREST ROUTE SURVEYING</td>
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<td>FE 316</td>
<td>SOIL MECHANICS</td>
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</tr>
<tr>
<td>FE 441</td>
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**Total Hours**: 16

**Fourth Year**

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<tr>
<td>FE 444</td>
<td>FOREST REMOTE SENSING AND PHOTOGRAMMETRY</td>
<td>4</td>
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<tr>
<td>GEG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
<td>3</td>
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<tr>
<td>or FW 350</td>
<td>or *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY</td>
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<tr>
<td>Bacc Core Courses</td>
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</table>
Forestry Undergraduate Major (BS, HBS)

The successful forester must understand the biological and physical processes of forest ecosystems, as well as the social, economic, and operational forces that influence forest policies and management actions. The forestry core curriculum includes basic courses in the biological, physical, social sciences, and six months of work experience as well as professional courses designed to prepare students to manage forest resources.

Students are required to select one of the following required options:

- Forest Restoration and Fire
- Forest Management
- Forest Operations Management

The Bachelor of Science degree in Forestry is accredited by the Society of American Foresters (SAF).

In addition to the listed courses, all students are required to complete a total of six months of satisfactory employment in an area related to their major. This is usually accomplished by two or more summers of work, but it may include work during the academic year. Work performance and personal conduct are thoroughly appraised by the College of Forestry.

Six months of forestry or related natural resource work experience and completion of an option is required in the forestry degree program. The option courses compliment the forestry core and serve to fulfill the 180 credits for graduation.

Pre-Professional Forestry Program

Admission to the pre-professional program requires that a student be admitted as a degree-seeking undergraduate or post-baccalaureate level student at Oregon State University. Courses included in the first and sophomore years comprise a pre-professional program of study that produces a solid foundation for professional program studies at the junior, senior, and advanced degree levels. The pre-professional program may be taken at Oregon State University or at any accredited college or university that offers equivalent courses transferable to OSU in conjunction with foundation forestry available via OSU Ecampus.

Professional Forestry Program

Successful completion of the pre-professional program will result in acceptance into the professional program. This requires selection of an option and:

1. a grade of 'C' or better in all pre-professional courses required for entry into the professional program (marked with an E on the course list). Grade repeat (replacement) policy will follow OSU Academic Regulation 20.
2. a minimum GPA of 2.25 based on the pre-professional courses (or transfer equivalents) satisfactorily completed.

Admission to the professional program will be granted for students meeting the admission requirements prior to fall term of the junior year. Application for the professional program will be made as of the end of winter term for the following fall term.

Enrollment in professional program courses is restricted to those students who have clearly demonstrated an ability to achieve the standards required for professional studies. The number of students

Forestry Minor

The Forestry minor provides basic knowledge about management of forest resources.

Minor Code: 706

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>FES 240</td>
<td>*FOREST BIOLOGY</td>
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<td>FES 241</td>
<td>DENDROLOGY</td>
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<tr>
<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
<td>3</td>
</tr>
<tr>
<td>FOR 330</td>
<td>FOREST RESOURCE ECONOMICS I</td>
<td>4</td>
</tr>
<tr>
<td>FOR 441</td>
<td>SILVICULTURE PRINCIPLES</td>
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<tr>
<td>Select a minimum of 10 credits of the following:</td>
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<tr>
<td>FE 370</td>
<td>HARVESTING OPERATIONS</td>
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<td>FE 434</td>
<td>FOREST WATERSHED MANAGEMENT</td>
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<tr>
<td>FE 456/456</td>
<td>*INTERNATIONAL FORESTRY</td>
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<td>FE 460</td>
<td>*FOREST OPERATIONS REGULATIONS AND POLICY ISSUES</td>
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<td>FES 355</td>
<td>MANAGEMENT FOR MULTIPLE RESOURCE VALUES</td>
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<td>FES 412</td>
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<td>FOR 346</td>
<td>TOPICS IN WILDLAND FIRE</td>
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<td>FOR 413/BOT 413</td>
<td>FOREST PATHOLOGY</td>
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<td>FOR 457/FE 457</td>
<td>TECHNIQUES FOR FOREST RESOURCE ANALYSIS</td>
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<td>FOR 460</td>
<td>*FOREST POLICY</td>
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<td>FOR 462</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
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<td>TRAL 251</td>
<td>RECREATION RESOURCE MANAGEMENT</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
admitted to the program is determined based on available resources. Students meeting the minimum Pre-Forestry GPA of 2.25 may or may not be admitted depending on available resources.

Students who have completed their pre-professional studies at a college or university other than Oregon State University must apply both to the OSU Office of Admissions for admission to OSU as a degree-seeking undergraduate or post-baccalaureate level student and to the College of Forestry for admission to the professional program. Application forms and information on policies and programs are available from the College of Forestry.

Students who have not satisfactorily completed all of the pre-professional courses when they apply may be provisionally accepted. Final acceptance is contingent on completion of any remaining pre-professional course work with grade of ‘C’ or better by the end of the summer term prior to entrance into the professional program. Students who receive provisional acceptance and then fail to attain ‘C’ or better grades in any remaining pre-professional course work prior to the beginning of fall term will be re-directed to the pre-professional forestry program.

All courses required for admission to the professional program must be completed before entering the professional program. Students may only enter the professional program for fall term each academic year.

The professional program begins with Forestry Field School during the two weeks prior to the first fall term of the professional program.

Major Code: 820

Pre-Forestry Major Code: 810

Pre-Forestry

Grade standards for the pre-professional program as listed in the program description apply.

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<th>Title</th>
<th>Hours</th>
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<tbody>
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<td>or *INTRODUCTION TO MICROECONOMICS</td>
<td></td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>FES 240</td>
<td>*FOREST BIOLOGY</td>
<td>4</td>
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<td>FES 241</td>
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<tr>
<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
<td>3</td>
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<td>or NR 201</td>
<td>or MANAGING NATURAL RESOURCES FOR THE FUTURE</td>
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<td>FOR 112</td>
<td>COMPUTING APPLICATIONS IN FORESTRY</td>
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<td>or FE 102</td>
<td>or FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY</td>
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<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
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<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
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<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
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</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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</table>

Final acceptance is contingent on completion of any remaining pre-professional course work with grade of ‘C’ or better by the end of the summer term prior to entrance into the professional program. Students who receive provisional acceptance and then fail to attain ‘C’ or better grades in any remaining pre-professional course work prior to the beginning of fall term will be re-directed to the pre-professional forestry program.

All courses required for admission to the professional program must be completed before entering the professional program. Students may only enter the professional program for fall term each academic year.

The professional program begins with Forestry Field School during the two weeks prior to the first fall term of the professional program.

Major Code: 820

Pre-Forestry Major Code: 810

Forest Management Option

This option is offered within the following major(s):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<td>FE 257</td>
<td>GIS AND FOREST ENGINEERING APPLICATIONS</td>
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<td>16-20</td>
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Professional Forestry

All students pursuing the BS in Forestry;

1. must earn grades of ‘C’ or better in all required professional forestry courses (with FE, FES, FOR course designators), or crosslisted course designators, or approved substitutions for majors and options, and;
2. must maintain a 2.0 GPA in all major course work, defined as courses listed by prefix (e.g., FOR, BA, BOT) and number, or used for substitution of required courses, and as part of option lists.
3. total credits required for graduation is 180.

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<td>FOR 321</td>
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<td>FOR 331</td>
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Fourth Year

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<td>*INTERNATIONAL FORESTRY (or other CGI Bacc Core course)</td>
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<td>TECHNIQUES FOR FOREST RESOURCE ANALYSIS</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Must be selected to satisfy baccalaureate core requirements
2 Required for entry into the professional program

Major Code: 820

Pre-Forestry Major Code: 810

Forest Management Option

This option is offered within the following major(s):
Option Code: 822

Pre-Professional Forestry

Grade standards for the pre-professional program as listed in the program description (p. 552) apply.

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<td>PLANNING AGROFORESTRY PROJECTS</td>
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<td>GEOSYSTEMIZATION: CARTOGRAPHY</td>
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<td>*FOREST, WOOD, AND CIVILIZATION</td>
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* Required for entry into the professional program.

* Baccalaureate Core Course (BCC)

Option Code: 822

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<td>*ENGLISH COMPOSITION</td>
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<td>COMPUTING APPLICATIONS IN FORESTRY</td>
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### Third Year

#### Fall
- **FE 312/FOR 312 FORESTRY FIELD SCHOOL** 2
- **FE 370 HARVESTING OPERATIONS** 4
- **FE 434 FOREST WATERSHED MANAGEMENT** 4
- **FES 341 FOREST ECOLOGY** 3
- **FOR 321 FOREST MENSURATION** 5

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#### Winter
- Select one of the following: 3-4
  - **FES 355** MANAGEMENT FOR MULTIPLE RESOURCE VALUES
  - **FES 477** *AGROFORESTRY*
  - **FES 485** *CONSSENSUS AND NATURAL RESOURCES*
  - **GEOG 300** *SUSTAINABILITY FOR THE COMMON GOOD*
- **FOR 322** FOREST MODELS 3
- **FOR 331** FOREST RESOURCE ECONOMICS II 4
- **Bacc Core course** 3

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#### Spring
- **FES 452** or **FW 452** BIODIVERSITY CONSERVATION IN MANAGED FORESTS or BIODIVERSITY CONSERVATION IN MANAGED FORESTS 3
- **FOR 330** FOREST RESOURCE ECONOMICS II 4
- **FOR 442** SILVICULTURE REFORESTATION 4
- **FOR 443** SILVICULTURAL PRACTICES 4

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#### Fourth Year

#### Fall
- **ULX 413/BOT 413 FOREST PATHOLOGY** 3
- **FE 444** FOREST REMOTE SENSING AND PHOTOGRAMMETRY 4
- **FE 457/FOR 457** TECHNIQUES FOR FOREST RESOURCE ANALYSIS 4

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#### Winter
- **FE 456/FOR 456** or **FE 459** INTERNATIONAL FORESTRY (or other CGI Bacc Core course) 3
- **FOR 460** or **FE 460** FOREST MANAGEMENT PLANNING AND DESIGN I 4

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#### Spring
- **FE 469/FOR 469** FOREST MANAGEMENT PLANNING AND DESIGN II 4
- **FES 412** FOREST ENTOMOLOGY 3

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### Forest Operations Management Option

This option is offered within the following major(s):
- Forestry - College of Forestry (p. 555)

The Forest Operations Management option requires the completion of 7 business courses that can be taken as a minor if the student gains entrance to the College of Business Entrepreneurship minor.

| Option Code: 823 |

### Restricted Electives for the Forest Management Option

Select a minimum of 15 credits of the following:
- **CROP 440** WEED MANAGEMENT
- **FE 310** FOREST ROUTE SURVEYING
- **FE 423** UNMANNED AIRCRAFT SYSTEM REMOTE SENSING
- **FE 436** FOREST DISTURBANCE HYDROLOGY

### Course Title Hours

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<td>FE 472</td>
<td>MECHANIZED HARVESTING AND SIMULATION</td>
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<td>FES 350/HORT 350</td>
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<td>PLANNING AGROFORESTRY PROJECTS</td>
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<td>FES 440</td>
<td>WILDLAND FIRE ECOLOGY</td>
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<td>FES 445/FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
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<td>MANAGING AT THE WILDLAND-URBAN INTERFACE</td>
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<td>FES 477/NR 477</td>
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<td>FES 485</td>
<td><em>CONSSENSUS AND NATURAL RESOURCES</em></td>
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<tr>
<td>FOR 346</td>
<td>TOPICS IN WILDLAND FIRE</td>
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<td>FOR 407</td>
<td>SEMINAR</td>
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<td>FOR 417</td>
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<td>FOR 431</td>
<td>ECONOMICS AND POLICY OF FOREST WILDLAND FIRE</td>
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<td>FOR 436</td>
<td>WILDLAND FIRE SCIENCE AND MANAGEMENT</td>
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<td>FOR 442</td>
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<td>FOR 462</td>
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<td>FOR 499</td>
<td>SPECIAL TOPICS (Must be pre-approved by academic advisor)</td>
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<td>GEOG 201</td>
<td><em>FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS</em></td>
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<td>GEODISPLAY: CARTOGRAPHY</td>
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<td>GEOG 480</td>
<td>REMOTE SENSING: PRINCIPLES AND APPLICATIONS</td>
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<td>OUTDOOR RECREATION MANAGEMENT ON PUBLIC LANDS</td>
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<td>TRAL 352</td>
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<td>TRAL 357</td>
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<td>WSE 470</td>
<td><em>FOREST, WOOD AND CIVILIZATION</em></td>
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### Restricted Electives for the Forest Management Option

Select a minimum of 15 credits of the following:
- **CROP 440** WEED MANAGEMENT
- **FE 310** FOREST ROUTE SURVEYING
- **FE 423** UNMANNED AIRCRAFT SYSTEM REMOTE SENSING
- **FE 436** FOREST DISTURBANCE HYDROLOGY

### Pre-Professional Forestry

Grade standards for the pre-professional program as listed in the program description (p. 552) apply.

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
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<td>or BA 315</td>
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<tr>
<td>BA 230</td>
<td>BUSINESS LAW</td>
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<tr>
<td>or BA 330</td>
<td>LEGAL ENVIRONMENT OF BUSINESS</td>
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</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
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### Forest Operations Management Option

This option is offered within the following major(s):
- Forestry - College of Forestry (p. 555)

The Forest Operations Management option requires the completion of 7 business courses that can be taken as a minor if the student gains entrance to the College of Business Entrepreneurship minor.

| Option Code: 823 |

### Pre-Professional Forestry

Grade standards for the pre-professional program as listed in the program description (p. 552) apply.

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<thead>
<tr>
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<td>BA 260</td>
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<th>Hours</th>
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<tr>
<td>BA 215</td>
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<td>or BA 315</td>
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<tr>
<td>BA 230</td>
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<td>or BA 330</td>
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<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
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### Third Year

#### Professional Forestry
Grade standards for the professional program as listed above apply.

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<td>FOREST OPERATIONS ANALYSIS</td>
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<td>Bacc Core Courses</td>
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#### Fourth Year

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<td>MANAGING ORGANIZATIONS</td>
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<tr>
<td>BA 460</td>
<td>VENTURE MANAGEMENT or BA 314</td>
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<td>or BA 314</td>
<td>or SUSTAINABLE BUSINESS OPERATIONS</td>
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#### Option Code: 823

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<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
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<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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#### Winter

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<td>GENERAL CHEMISTRY</td>
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<td>CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
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<td>FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY</td>
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<td>HHS 231</td>
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<td>*INTRODUCTION TO MICROECONOMICS</td>
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<td>FES 240</td>
<td>*FOREST BIOLOGY</td>
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<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
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#### Second Year

#### Fall

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<td>FE 208</td>
<td>FOREST SURVEYING</td>
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<td>FES 241</td>
<td>DENDROLOGY</td>
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#### Winter

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<tr>
<td>BA 215</td>
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<td>BI 204</td>
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<td>FE 257</td>
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### Fourth Year

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#### Winter

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<tr>
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<td>FOREST OPERATIONS ANALYSIS</td>
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#### Option Code: 823

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#### Spring

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#### Fourth Year

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#### Spring

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#### Total Hours

| Total Hours | 180-182 |

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* Required for entry into the professional program.  
* Baccalaureate Core Course (BCC)  
^ Writing Intensive Course (WIC)
Forest Restoration and Fire Option

This option is offered within the following major(s):

• Forestry - College of Forestry (p. 555)

Disturbance processes, such as wildland fire, insect or disease outbreak, landslide, and windthrow, are important considerations in any actively managed forest, regardless of the specific management objective. The Forest Restoration and Fire option prepares students to understand, manage, mitigate and/or use forest disturbance processes, especially wildland fire, as part of a forest management plan.

Option Code: 824

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<tr>
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<td>ECOLOGICAL RESTORATION or ECOLOGICAL RESTORATION</td>
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<td>FES 485</td>
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¹ Required for entry into the professional program.

* Baccalaureate Core Course (BCC)

Option Code: 824

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<td>FOR 111 or NR 201</td>
<td>INTRODUCTION TO FORESTRY or MANAGING NATURAL RESOURCES FOR THE FUTURE</td>
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<td>MTH 111</td>
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<td>HHS 231</td>
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<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>FES 240</td>
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<td>FE 370</td>
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<td>FE 434</td>
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<td>FOR 322</td>
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<td>FOR 331</td>
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<td>FOR 346</td>
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<td>FOR 436</td>
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Sustainable Forest Management
Graduate Major (MF, MS, PhD)

Graduate Areas of Concentration

Engineering for sustainable forestry: forest biometrics and geomatics; forest operations planning and management; forest policy analysis and economics; forest soil and watershed processes; silviculture, fire, and forest health

Professional Master of Forestry Programs

Forest business for private landowners; spatial science and analysis; silviculture, fire, and forest health

The Sustainable Forest Management (SFM) graduate program emphasizes the conservation of forest-dominated landscapes to meet a defined set of ecological, economic and social criteria over long time frames. The program follows the sustainable principles outlined by the Montreal Process Criteria and Indicators. These principles have been adopted by the state of Oregon.

The program provides a strong grounding in the principles and techniques of active management of forests to improve forest health and condition while producing a full range of products and ecosystems services. It consists of a core in the principles and criteria of sustainable forest management; statistics for design and interpretation of experiments; and specialization in one of six areas of concentration. The MF degree requires a project, MS a thesis, and PhD a dissertation.

Areas of Concentration

Engineering for Sustainable Forestry—Designing forest operations to achieve sustainable forest management objectives; ecological restoration operations; road design and construction. Supporting course work often draws from slope and embankment, industrial systems optimization, watershed impacts of forest disturbance, GIScience II: analysis and applications, forest transportation systems, forest hydrology, forest geomatics, forest road engineering, forest road system management, water quality and forest land use, forest operations analysis, advanced logging logistics, harvesting management, advanced silviculture, heuristics for combinatorial optimization, economics of the forest resource, and human factors engineering. Contacts: Belart, Chung, Leshchinsky, Lyons, Olsen, Segura, Sessions, Wing

Forest Biometrics and Geomatics—Modeling tree and stand development; forest data sampling and monitoring methods; forest measurements and assessments; mapping and data management technologies. Supporting course work often draws from forest biometrics, forest geomatics, geospatial data and analysis, digital terrain modeling, GIScience II: analysis and applications, geodesy, spatio-temporal variation in ecology and earth sciences, remote sensing, advanced landscape and seascape ecology, generalized regression modeling, scientific visualization, forest models, statistical methods, forest policy analysis, advanced silviculture, quantitative ecology, GIS in water resources, ecological sampling, theory of statistics, applied multivariate design, advanced experimental design, remote sensing I. time series Contacts: Hailermariam, Kiser, Maguire, Strimbu, Wing

Forest Operations Planning and Management—Planning, organizing, and executing forest plans; enhancing supply chain efficiency and improving international competitiveness. Supporting course work often draws from tactical and operational planning, geospatial data and analysis, forest policy analysis, industrial systems optimization, advanced silviculture, harvesting management, organization leadership and management, marketing and innovation in renewable materials forestry supply chain management, forest geomatics, forest transportation systems, forest operations regulations and policy issues, heuristics for combinatorial optimization, forest wildlife habitat management, industrial systems optimization, statistical methods, forest biometrics, unmanned aircraft system remote sensing, forest transportation systems, techniques for forest resource analysis, forest operations analysis, operations regulations and policy issues, mathematical statistics Contacts: Belart, Chung, Lyons, Sessions, Strimbu

Forest Policy Analysis and Economics—Analyzing tradeoffs in the forest and resource policy decision process; public land use policy; interpretations of regulations; markets for forest products; forest certification; theoretical and applied research related to ecosystem services. Supporting course work often draws from natural resource policy and law, microeconomic theory, environmental policy and law interactions, forest policy analysis, economics of the forest resource, applied and advanced econometrics, heuristics for combinatorial optimization, global context of the forest sector, techniques for forest resource analysis, economics and policy of forest wildland fire, silvicultural influences on forest ecosystem dynamics, wildland fire science management, time series; and work in other fields to support thesis or dissertation research. This area of concentration is jointly sponsored by FERM, the Applied Economics Graduate Program and the Applied Economics Department. Contacts: Cushing, Huntington, Kuusela, Souder

Forest Soil and Watershed Processes—Understanding watershed conditions and processes in forested ecosystems and the effects of management activities; evaluating and improving soil and water quality and related practices and policies for forest operations. Supporting course work often draws from forest hydrology, soil physics, environmental soil chemistry, geomorphology and landscape ecology, geospatial data analyses, principles of fluid mechanics, stream ecology, nutrient cycling, snow hydrology, river engineering, natural resources and forest ecosystems analysis, mineral organic matter interactions, open channel flow, managing forest nutrition, GIS in water resources, ecological restoration stream ecology, mineral-organic matter interactions, limnology, design and analysis of planned experiments, statistical methods, sediment transport, principles of stable
isotopes, advanced forest soils, watershed processes, forest hydrology, principles of stable isotopes, environmental soil chemistry, properties and functions of soils, regional hydrologic modeling, mineral organic matter interactions, soil morphology and classification. **Contacts:** Bladon, Hatten, Segura, Souder

**Silviculture, Fire, and Forest Health**—Manipulating vegetation to achieve management objectives, from restoration to intensive timber production; fire ecology and fire management; forest ecosystem health. Supporting course work often draws from advanced silviculture, geospatial data analysis, forest Pathology, forest entomology, environmental policy and law interactions, natural resource policy and law, plant pathology, community structure and analysis, wildland fire science and management, ecological restoration, forest policy analysis, statistical methods, sampling methods, forest hydrology, water quality and forest land use, natural resource data analysis, advanced forest community ecology, wildland fire ecology, biology of invasive plants, forest wildlife habitat management, global change ecology, weed management, advanced landscape and seascape ecology, quantitative ecology, and ecological sampling. **Contacts:** Bailey, Davis, Fitzgerald, Gonzalez-Benecke, Kiser, LeBoldus, Maguire, Powers, Shaw

**Professional Pathway Foci**

**Forest Business for Private Landowners**—Applying business techniques to assist management decisions for private forest landowners. **Contact:** Cushing

**Spatial Science and Analysis**—Application of spatial science and tools for managing natural resources. **Contact:** Wing

**Silviculture, Fire, and Forest Health**—Managing forest vegetation dynamics and ecosystem processes to achieve a range of management objectives. **Contact:** Powers

**Major Code:** 1090

**Wood Science and Engineering**

Use of renewable materials is increasing as the world becomes more concerned about climate change and population growth. Americans use thousands of different products such as wood each year—by weight more than we do of steel, cement and plastic combined. To meet the growing demand for renewable materials and to maximize the benefits of bio-energy and renewable products we must be smarter in how and where we use them. New opportunities for the world through renewable materials is the core of wood science and engineering at OSU.

The department is a world leader in research, outreach and education related to renewable, wood-based materials and products. It offers an undergraduate degree program in Renewable Materials that prepares students for diverse careers in the private sector that is a major component of the Pacific Northwest economy and around the world. Graduates are in high demand as climate change concerns and advanced technology accelerate the transformation to a globally competitive, green renewable materials-based industry.

The department also offers MS and PhD degrees in Wood Science. These graduate programs ensure a foundation in science that is supplemented with programs tailored to student interest. Many students pursue dual majors in science or engineering fields. Interested students should see the department Web page for more information or contact the department head.

**Undergraduate Programs**

**Major**
- Renewable Materials (p. 567)
  - **Options:**
    - Advanced Wood Manufacturing
    - Art and Design
    - Science and Engineering
    - Management and Marketing

**Minor**
- Renewable Materials (p. 567)

**Graduate Programs**

**Major**
- Wood Science (p. 573)

**Minor**
- Wood Science (p. 574)

**Eric Hansen, Head**
119 Richardson Hall
Oregon State University
Corvallis, OR 97331-5751
Phone: 541-737-4240
Email: woodscience@oregonstate.edu
Website: http://woodscience.oregonstate.edu/

**Faculty**

**Professors** Gupta, Hansen, Kamke, Muszynski, Nairn, Schimleck, Simonsen

**Associate Professors** Knowles, Leavengood, Robinson, Sinha

**Assistant Professors** Du, Presley, Riggio

**Instructors** Fore, Hermann, G. Li, Mangla

**Affiliate Faculty**
Aimene, Bull, Davis, Kozak, Kutnar, Toppinen, Zelinka

**Adjunct Faculty**
A. Barbosa (Civil and Construction Engineering), T. Miller (Civil and Construction Engineering)

**Licensed Professional Engineer**

**Wood Science and Engineering**

WSE 111. RENEWABLE MATERIALS FOR A GREEN PLANET. (2 Credits)

Renewable materials are an integral part of modern lifestyles, and current societal trends point to increased use of renewable materials. This course provides an overview of renewable materials and their current applications in society. As an overview course, it covers a breadth of renewable material uses and exposes students to life-cycle thinking.
WSE 210. *RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION. (4 Credits)
Characteristics and uses of renewable fiber products including wood, bamboo and grasses; manufacturing processes; effect of tree growth and harvesting on renewable products manufacturing and properties. Wood identification. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: FP 210

WSE 211. WOODTURNING WITH SCIENCE I. (4 Credits)
An introduction to scientific woodturning. Students will get a grounding in tools, lathes, sharpening, and set-up, and then will transition into turning basic forms (spindle and bowl). Particular relevance will be placed upon grain orientation, wood moisture content, wood anatomy, wood chemistry, wood species and extractive effects, and how all of these attributed affect both form and function. Class instruction will be entirely studio based. CROSSLISTED as ART 211/WSE 211.
Equivalent to: ART 211
This course is repeatable for 8 credits.

WSE 225. DEVELOPMENTS OF BUILDING DESIGN WITH RENEWABLE MATERIALS. (3 Credits)
Introduction to architectural design, considering the different building requirements and the solutions available, with a focus on wood-based products and other ligno-cellulosic materials.

WSE 250. CAD: COMPUTER AIDED DESIGN. (3 Credits)
Provides students with the tools and techniques to design and render products, furniture, and structures using Solidworks, as well as create technical drawings that facilitate communication between designers, engineers, and clients. The techniques developed during this course are applicable to a wide variety of industrial CAD and product design industries worldwide. Lec/lab/studio.

WSE 266. *INDUSTRIAL HEMP. (3 Credits)
Introduction to the botany, biology and agronomy of the hemp plant, and the origins, historical contexts and implications of contemporary legal and social issues surrounding its use for food, fiber, and building products. Taught via Ecampus only. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture

WSE 299. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

WSE 320. ANATOMY OF RENEWABLE MATERIALS. (3 Credits)
Examination of macroscopic and microscopic anatomy of renewable (plant based) materials commonly used by society. Learning activities including lecture and the hands-on study of the various plant materials and their components with naked-eye, hand lens, and microscopic examination. Lec/lab.

WSE 321. CHEMISTRY OF RENEWABLE MATERIALS. (3 Credits)
Chemical structures and chemical properties of renewable plant-based materials will be taught at molecular levels. Chemical compositions of different renewable materials will be covered. Chemical and biochemical modifications and applications or renewable materials will be discussed in detail. Lec/lab.
Prerequisites: CH 122 with D- or better or CH 202 with D- or better or CH 232 with D- or better or CH 232H with D- or better

WSE 322. PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS. (4 Credits)
Introduction to thermodynamics and mechanics of plant fibers, solid wood and bio-based composites: hygroscopicity, heat and mass transport; statics, elasticity and strength of materials; mechanical properties.
Prerequisites: WSE 321 with C- or better

WSE 324. RENEWABLE MATERIALS LABORATORY. (3 Credits)
Integrates the knowledge gained in the core science courses (WSE 321 and WSE 322) to help students obtain a deeper understanding of how chemistry, physics, and anatomy affect renewable material properties. The course uses renewable fiber materials such as hardwoods, softwoods, natural fibers, bamboo, composite wood products (e.g. OSB, plywood, MDF, etc.) and fiber-based products (e.g. wood-plastic composites, natural fiber composites, straw panels, paper, etc.) to examine the intricate relationships between fundamental properties and performance. Lec/lab.
Prerequisites: WSE 321 with C- or better and WSE 322 [C-]

WSE 350. SECONDARY PRODUCTS DESIGN AND MANUFACTURING. (3 Credits)
Provides students with hands-on experience designing and manufacturing wood furniture. Includes how to safely operate and properly maintain wood working equipment, as well as how to design for consumers with efficient manufacturing processes in mind. Lec/lab/studio.
Prerequisites: WSE 250 with C- or better

WSE 351. ADVANCED CAD: COMPUTER AIDED DESIGN. (3 Credits)
Develop advanced techniques using industry standard CAD software as it relates to wood based product, furniture, and structural design. Build upon the skills acquired during WSE 250 CAD: COMPUTER AIDED DESIGN and learn advanced Solidworks techniques. Introduction to Rhinoceros 3D software and various parametric plugins. Lec/studio.
Prerequisites: WSE 250 with C- or better

WSE 352. CAM FOR THE CNC ROUTER AND LASER ENGRAVER. (3 Credits)
Process G-code using CAM software for CNC routing operations, as well as create raster and vector drawings for laser cutting/engraving applications. Each student will work through the design process researching and conceptualizing ideas, 3D modeling designs, developing working prototypes, and fabricating a final product. Lec/lab/studio.
Prerequisites: WSE 350 with C- or better
Recommended: Introductory level CAD course or demonstrated proficiency in industry standard CAD software

WSE 385. *EVALUATING SUSTAINABILITY THROUGH LIFE CYCLE ANALYSIS. (3 Credits)
With increased focus on sustainability, it has become important to quantify a sustainability metric of a material, process, or a system. To that end an understanding of life cycle analysis (LCA) is needed that can be used to determine a sustainability metric. This Ecampus course presents the use of LCA to gain insights on the environmental and social impacts of the choices we make. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

WSE 385. *EVALUATING SUSTAINABILITY THROUGH LIFE CYCLE ANALYSIS. (3 Credits)
With increased focus on sustainability, it has become important to quantify a sustainability metric of a material, process, or a system. To that end an understanding of life cycle analysis (LCA) is needed that can be used to determine a sustainability metric. This Ecampus course presents the use of LCA to gain insights on the environmental and social impacts of the choices we make. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
WSE 392. *BAMBOOLOOZA: THE FASCINATING WORLD OF BAMBOO. (3 Credits)
An exploration of the world of bamboo and its application to renewable products. This course provides an in-depth understanding of a renewable material bamboo from its native form to processed products. Additionally, this course discusses the utilization and perception of bamboo in different societies of the world. Taught via Ecampus only. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

WSE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

WSE 401. RESEARCH. (1-16 Credits)
Equivalent to: FP 401
This course is repeatable for 16 credits.

WSE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

WSE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FP 405
This course is repeatable for 16 credits.

WSE 406. PROJECTS. (1-16 Credits)
Equivalent to: FP 406
This course is repeatable for 16 credits.

WSE 413. WOODTURNING WITH SCIENCE II. (4 Credits)
An in-depth look at how character in wood (figure, spalting, knots, etc.) affects machinability and output in both functional and aesthetic turning. Students will work with a wide range of spalted wood types and figure across numerous species while working on advanced turning forms. Particular emphasis will be placed upon how figure affects grain orientation, how spalting affects density and stability, and how the challenges with character wood can be overcome without specialty tools. Class instruction will be entirely studio based. CROSSLISTED as ART 413/WSE 413.
Prerequisites: WSE 210 with C- or better and WSE 211 [C-]
Equivalent to: ART 413, FP 413
This course is repeatable for 8 credits.

WSE 414. ^ART AND DESIGN CAPSTONE. (4 Credits)
For the final term of a student’s last year in the Renewable Materials Industrial Design program, this course brings together the basic collaborative design elements and technical background of each student in the creation of collaborative design projects with the intention of giving students real-world, problem-based design experience. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

WSE 425. TIMBER TECTONICS IN THE DIGITAL AGE. (4 Credits)
An exploration of the advances in design, construction and fabrication of timber buildings. Includes experimentation with both physical and digital models and a final project, in collaboration with UO Architecture students.
Lec/lab/studio.
Recommended: Junior standing and knowledge of CAD
WSE 461. BIO-BASED PRODUCTS MANUFACTURING. (4 Credits)
First of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include the major processing steps for the conversion of raw materials such as wood, bamboo, hemp, and cereal straws into products.
Prerequisites: WSE 210 with C- or better and WSE 321 [C-] and WSE 324 [C-]

WSE 462. ADVANCED MANUFACTURING 1. (4 Credits)
Second of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process design elements, quality control, and approaches to continuous process improvement.
Prerequisites: WSE 461 with C- or better

WSE 463. ADVANCED MANUFACTURING 2. (4 Credits)
Third of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process control, optimization, automation, and contemporary topics such as Big Data and the Internet of Things and the potential impacts of the trends on manufacturing enterprises.
Prerequisites: WSE 462 with C- or better

WSE 465. RENEWABLE MATERIALS MANUFACTURING EXPERIENCE. (2 Credits)
Learning about and visiting a number of renewable materials industrial and commercial operations representing all parts of the renewable materials value chain. The class will meet daily for one 5-day week immediately prior to the start of fall term. During the week, the students and at least one instructor will meet daily. Lectures will precede visits to industrial plants, mills and sites. At the end of the day, an instructor will participate in a debriefing session, reiterating what was learned during the day. Students will then submit a report on the day’s activities. The class includes daily travel and overnight stays.
This course is repeatable for 4 credits.

WSE 470. *FORESTS, WOOD, AND CIVILIZATION. (3 Credits)
Multidisciplinary examination of issues related to the roles of forests, trees, and wood in civilization, as providers of commodities, ecosystem services, and spiritual and artistic inspiration. Issues include global supply and demand, wood ownership and political power, and perceptions and uses of forest resources in different societies. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WSE 470H

WSE 470H. *FORESTS, WOOD, AND CIVILIZATION. (3 Credits)
Multidisciplinary examination of issues related to the roles of forests, trees, and wood in civilization, as providers of commodities, ecosystem services, and spiritual and artistic inspiration. Issues include global supply and demand, wood ownership and political power, and perceptions and uses of forest resources in different societies. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WSE 470

WSE 471. RENEWABLE MATERIALS IN BUILDING CONSTRUCTION. (3 Credits)
Building construction is a major application of renewable materials, primarily wood. This course explores material selection options, applications, and performance characteristics. Residential construction is emphasized, but non-residential construction applications will also be discussed. Concepts and interpretation of life cycle assessment are introduced.

WSE 473. BIOENERGY AND ENVIRONMENTAL IMPACT. (3 Credits)
Explores world’s use of woody biomass fuels, their potential to contribute to our region’s energy supply, and conversion technologies such as direct combustion, pyrolysis, and thermochemical modification. Also examines emissions and other environmental impacts of utilizing renewable materials to generate energy and manufacture products.
Prerequisites: ((MTH 111 with D- or better or MTH 112 with D- or better or MTH 231 with D- or better or MTH 241 with D- or better or MTH 245 with D- or better or MTH 251 with D- or better or MTH 251H with D- or better) and (CH 122 [D-] or CH 222 [D-] or CH 232 [D-] or CH 232H [D-]))

WSE 475. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)

WSE 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 99 credits.

WSE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FP 501
This course is repeatable for 99 credits.

WSE 503. THESIS. (1-16 Credits)
Equivalent to: FP 503
This course is repeatable for 999 credits.

WSE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FP 505
This course is repeatable for 16 credits.

WSE 506. PROJECTS. (1-16 Credits)
Equivalent to: FP 506
This course is repeatable for 16 credits.

WSE 507. SEMINAR. (1 Credit)
This course is repeatable for 99 credits.

WSE 513. WOODTURNING WITH SCIENCE II. (4 Credits)
An in-depth look at how character in wood (figure, spalting, knots, etc.) affects machinability and output in both functional and aesthetic turning. Students will work with a wide range of spalted wood types and figure across numerous species while working on advanced turning forms. Particular emphasis will be placed upon how figure affects grain orientation, how spalting affects density and stability, and how the challenges with character wood can be overcome without specialty tools. Class instruction will be entirely studio based.
This course is repeatable for 12 credits.
Recommended: WSE 210 and WSE 211

WSE 514. ART AND DESIGN CAPSTONE. (4 Credits)
For the final term of a student’s last year in the Renewable Materials Industrial Design program, this course brings together the basic collaborative design elements and technical background of each student in the creation of collaborative design projects with the intention of giving students real-world, problem-based design experience.
WSE 516. INTRODUCTION TO SCULPTURAL WOODTURNING. (4 Credits)
The development of studio/sculptural woodturning has a unique history, and involves a cluster of specialized skills. This course blends historic woodturning practices with modern approaches and aesthetics to bring an understanding of wood science into this very specialized field of woodturning.
Prerequisites: WSE 513 with B or better and WSE 514 [B]
This course is repeatable for 12 credits.

WSE 520. THE GLOBAL CONTEXT OF THE FOREST SECTOR. (3 Credits)
Provides a broad knowledge base of business and marketing practices in the global forest industry. Includes a module on research ethics that fulfills OSU Graduate School requirements.

WSE 521. WOOD SCIENCE I. (4 Credits)
A comprehensive overview and integration of wood anatomy, wood physics, wood chemistry and wood mechanics; global contemporary issues impacting the wood and fiber sector; integration of basic wood sciences to understand the complex relationships between environment and wood material properties, and the influence of both on the use of wood-based materials.

WSE 522. WOOD SCIENCE II. (4 Credits)
Continuation of the comprehensive overview and integration of wood and fiber anatomy, physics, chemistry, and mechanics; integration of basic wood science to understand relationships with wood and fiber properties and their impact on final use. Focus on biological, chemical and physical degradation of wood; adhesion; and physical and engineering properties of wood. Lec/lab.

WSE 525. TIMBER TECTONICS IN THE DIGITAL AGE. (4 Credits)
An exploration of the advances in design, construction and fabrication of timber buildings. Includes experimentation with both physical and digital models and a final project, in collaboration with UO Architecture students. Lec/lab/studio.
Recommended: Knowledge of CAD

WSE 526. STRUCTURAL HEALTH ASSESSMENT/MONITORING OF TIMBER BUILDINGS. (3 Credits)
Holistic approaches for the evaluation of the performance of timber systems and structures in a building. Learn about the tools available to experts for different analysis purposes, and to understand how data acquired from different techniques can be analyzed and used to inform building management and maintenance, fabrication and construction practices, and future design.

WSE 530. POLYMER COMPOSITES. (3 Credits)
A comprehensive survey of the material and mechanical properties of polymer-based composite materials including failure mechanisms, interfacial and nanoscale effects, and transport and thermal properties.
Recommended: CHE 545 and multivariable calculus

WSE 535. POLYMER SYNTHESIS AND STRUCTURE. (3 Credits)
A comprehensive overview of various synthetic methods for various synthetic polymers; structures of various synthetic and natural polymers.
Recommended: 3 credits of undergraduate organic chemistry or CH 331 or CH 334

WSE 553. FOREST PRODUCTS BUSINESS. (3 Credits)
Provides students with the skills necessary to operate effectively in the global forest products industry.
Recommended: ECON 201 and ECON 202

WSE 555. INDUSTRIAL MARKETING IN THE FOREST SECTOR. (3 Credits)
Marketing relies heavily on effective communication, so this course concentrates on written and oral communication. The course will arm students with the skills necessary to apply basic concepts of marketing of forest products. Application will be highlighted through examples and industry speakers relating coursework to the day-to-day work in business.
Equivalent to: FP 555

WSE 558. WOOD DESIGN. (4 Credits)
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab. CROSSLISTED as CE 584/WSE 558.
Equivalent to: CE 584
Recommended: CE 383 or CE 481 with minimum grade of C

WSE 561. BIO-BASED PRODUCTS MANUFACTURING. (4 Credits)
First of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include the major processing steps for the conversion of raw materials such as wood, bamboo, hemp, and cereal straws into products.
Recommended: WSE 210 and WSE 321 and WSE 324

WSE 562. ADVANCED MANUFACTURING 1. (4 Credits)
Second of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process design elements, quality control, and approaches to continuous process improvement.
Recommended: WSE 461

WSE 563. ADVANCED MANUFACTURING 2. (4 Credits)
Third of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process control, optimization, automation, and contemporary topics such as Big Data and the Internet of Things and the potential impacts of the trends on manufacturing enterprises.
Recommended: WSE 462

WSE 571. RENEWABLE MATERIALS IN BUILDING CONSTRUCTION. (3 Credits)
Building construction is a major application of renewable materials, primarily wood. This course explores material selection options, applications, and performance characteristics. Residential construction is emphasized, but non-residential construction applications will also be discussed. Concepts and interpretation of life cycle assessment are introduced.

WSE 573. BIOENERGY AND ENVIRONMENTAL IMPACT. (3 Credits)
Explores world’s use of woody biomass fuels, their potential to contribute to our region’s energy supply, and conversion technologies such as direct combustion, pyrolysis, and thermochemical modification. Also examines emissions and other environmental impacts of utilizing renewable materials to generate energy and manufacture products.
Recommended: (MTH 111 or MTH 112 or MTH 231 or MTH 241 or MTH 245 or MTH 251 or MTH 251H) and (CH 122 or CH 222)

WSE 575. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)
WSE 592. ADVANCED WOOD DESIGN. (4 Credits)
Recommended: Understanding of basic concepts in mechanics and timber design

WSE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 99 credits.

WSE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FP 601
This course is repeatable for 16 credits.

WSE 603. THESIS. (1-16 Credits)
Equivalent to: FP 603
This course is repeatable for 999 credits.

WSE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WSE 606. PROJECTS. (1-16 Credits)
Equivalent to: FP 606
This course is repeatable for 16 credits.

WSE 607. SEMINAR. (1 Credit)
Section 1: Beginning Seminar. Section 2: Graduate Seminar.
Equivalent to: FP 607
This course is repeatable for 99 credits.

WSE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Renewable Materials Minor

The minor in Renewable Materials exposes students to the world of renewable materials science and technology and will enable students in other majors to gain a specialization that will make them more competitive for careers associated with green materials and allied industries.

Minor Code: 238

Students must complete a minimum of 27 credits for the minor, at least 12 of which must be upper division.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CH 122</td>
<td>*GENERAL CHEMISTRY</td>
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<tr>
<td>WSE 210</td>
<td>*RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION</td>
<td>4</td>
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<tr>
<td>WSE 321</td>
<td>CHEMISTRY OF RENEWABLE MATERIALS</td>
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<tr>
<td>WSE 322</td>
<td>PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS</td>
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Select a minimum of 11 credits from the following:

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<td>FOR 11</td>
<td>INTRODUCTION TO FORESTRY</td>
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<tr>
<td>WSE 266</td>
<td>*INDUSTRIAL HEMP</td>
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<tr>
<td>WSE 324</td>
<td>RENEWABLE MATERIALS LABORATORY</td>
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<tr>
<td>WSE 453</td>
<td>*FOREST PRODUCTS BUSINESS</td>
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<tr>
<td>WSE 455</td>
<td>INDUSTRIAL MARKETING IN THE FOREST SECTOR</td>
<td></td>
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<tr>
<td>WSE 458</td>
<td>DESIGN OF WOOD STRUCTURES (Effective Winter 2015)</td>
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<tr>
<td>WSE 461</td>
<td>BIO-BASED PRODUCTS MANUFACTURING</td>
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<tr>
<td>WSE 462</td>
<td>ADVANCED MANUFACTURING 1</td>
<td></td>
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<tr>
<td>WSE 465</td>
<td>RENEWABLE MATERIALS MANUFACTURING EXPERIENCE</td>
<td></td>
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<tr>
<td>WSE 470</td>
<td>*FORESTS, WOOD, AND CIVILIZATION</td>
<td></td>
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<tr>
<td>WSE 471</td>
<td>RENEWABLE MATERIALS IN BUILDING CONSTRUCTION</td>
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</table>

Total Hours: 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Minor Code: 238

Renewable Materials Undergraduate Major (BS, HBS)

The Bachelor of Science degree in Renewable Materials program is a multidisciplinary professional program that prepares students to work with renewable, plant-based materials to solve challenging world problems. Renewable materials such as wood, bamboo, canes, and agricultural fibers are examined to understand their characteristics and how to make useful products. Students gain broad perspectives on current issues associated with the sustainable utilization of renewable materials, including global trade, business innovation, energy production, and environmental impacts.

Graduates with degrees in renewable materials are highly sought after to work in business, manufacturing operations, and technical support where they use their knowledge and expertise to help develop sustainable products, industrial systems, and economies.

The curriculum includes a lower-division core in science and math with a choice of one of the required upper-division options in Advanced Wood Manufacturing (AWD), Art and Design (A&D), Management and Marketing (M&M), or Science and Engineering (S&E).

- The AWD option develops students' knowledge of smart manufacturing and its application in renewable materials industries.
- The A&D option prepares students to engage with renewable materials on an aesthetic level. Artistically-oriented students learn how materials function within the human space and gain an understanding of green buildings and architecture.
- The M&M option is designed for students interested in business. Completion of the M&M option and meeting additional grade requirements of the College of Business will fulfill the requirements for a transcript-visible Business and Entrepreneurship minor.
- The S&E option is a flexible program that allows technically oriented students to design a personalized curriculum that opens doors to jobs that solve complex problems or to graduate school. Students select courses (often minors) that complement their interests.

In addition to the course work, all students must have six months of work experience in an area related to their major. This is usually accomplished by two summers of employment in business or industry, but it may include work during the academic year. The department has an established network of connections to help place students in internships and summer employment.

Major Code: 238

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
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<tr>
<td>Select 51 credits</td>
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<tr>
<td>Fitness                                                                 51</td>
<td></td>
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</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td></td>
</tr>
</tbody>
</table>
Advanced Wood Manufacturing Option

This option is offered within the following major(s):

- Renewable Materials - College of Forestry (p. 567)

This option complements the Renewable Materials core curriculum that develops students' knowledge of properties and behavior of bio-based materials. It adds a strong foundation in how the products are manufactured, as well as how the manufacturing processes are designed, managed, controlled, and optimized. Students will be exposed to important advanced topics such as automation, scanning and optimization systems, computer numerically controlled (CNC) machining, robotics, 3D printing, as well as how emerging topics such as the Internet of Things (IoT) and Big Data may impact the future of manufacturing.

Option Code: 793

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BA 215</td>
<td>Fundamentals of Accounting</td>
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<tr>
<td>CH 122</td>
<td>*General Chemistry</td>
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<tr>
<td>ECON 201</td>
<td>*Introduction to Microeconomics</td>
<td>4</td>
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<tr>
<td>ECON 202</td>
<td>*Introduction to Macroeconomics</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 390</td>
<td>Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>IE 255</td>
<td>Introductory Quantitative Analysis of Industrial and Manufacturing Systems</td>
<td>3</td>
</tr>
<tr>
<td>or ST 314</td>
<td>Introduction to Statistics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>IE 285/MFGE 285</td>
<td>Introduction to Industrial and Manufacturing Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IE 366</td>
<td>Work Systems Engineering</td>
<td>4</td>
</tr>
<tr>
<td>IE 367</td>
<td>Production Planning and Control</td>
<td>4</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*Differential Calculus</td>
<td>4</td>
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<tr>
<td>MTH 252</td>
<td>Integral Calculus</td>
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<tr>
<td>Select one PH course series:</td>
<td>12-15</td>
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<tr>
<td>PH 201</td>
<td>*General Physics</td>
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<tr>
<td>&amp; PH 202</td>
<td>and *General Physics</td>
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<tr>
<td>&amp; PH 203</td>
<td>and *General Physics</td>
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<tr>
<td>PH 211</td>
<td>*General Physics With Calculus</td>
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<tr>
<td>&amp; PH 212</td>
<td>and *General Physics With Calculus</td>
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<tr>
<td>&amp; PH 213</td>
<td>and *General Physics With Calculus</td>
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<td>WSE 350</td>
<td>Secondary Products Design and Manufacturing</td>
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<td>WSE 351</td>
<td>Advanced CAD: Computer Aided Design</td>
<td>3</td>
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<tr>
<td>WSE 352</td>
<td>CAM for the CNC Router and Laser Engraver</td>
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<tr>
<td>WSE 425</td>
<td>Timber Tectonics in the Digital Age</td>
<td>4</td>
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<td>WSE 450</td>
<td>Entrepreneurial Product Development I</td>
<td>3</td>
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<tr>
<td>WSE 451</td>
<td>Entrepreneurial Product Development II</td>
<td>3</td>
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<tr>
<td>WSE 455</td>
<td>Industrial Marketing in the Forest Sector</td>
<td>3</td>
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<td>WSE 461</td>
<td>Bio-Based Products Manufacturing</td>
<td>4</td>
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<tr>
<td>WSE 462</td>
<td>Advanced Manufacturing 1</td>
<td>4</td>
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<tr>
<td>WSE 463</td>
<td>Advanced Manufacturing 2</td>
<td>4</td>
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<tr>
<td>Total Hours</td>
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</table>

Baccalaureate Core Courses (18)
(Not satisfied by the Renewable Materials core or the option.)

Courses meeting other baccalaureate core requirements for the following categories not specified by the Renewable Materials Core or the option can be found in the OSU Catalog online at https://catalog.oregonstate.edu/

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>Cultural Diversity</td>
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<tr>
<td>Difference, Power, and Discrimination</td>
<td>3</td>
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<tr>
<td>Literature and Arts</td>
<td>3</td>
<td></td>
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<tr>
<td>Western Culture</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Science, Technology, and Society Synthesis</td>
<td>3</td>
<td></td>
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<tr>
<td>Contemporary Global Issues</td>
<td>3</td>
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</tr>
</tbody>
</table>

Plus additional Electives sufficient to ensure 180 total credits (60 must be upper division).

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)
Winter

CH 122  *GENERAL CHEMISTRY 5
FOR 112  COMPUTING APPLICATIONS IN FORESTRY 3
HHS 231  *LIFETIME FITNESS FOR HEALTH 2
MTH 251  *DIFFERENTIAL CALCULUS 4
WSE 111  RENEWABLE MATERIALS FOR A GREEN PLANET 2

Hours 16

Spring

CH 123  *GENERAL CHEMISTRY 5
MTH 252  INTEGRAL CALCULUS 4
WR 121  *ENGLISH COMPOSITION 3
PAC Course 1

Hours 13

Second Year

Fall

ECON 201  *INTRODUCTION TO MICROECONOMICS 4
IE 285 or MFGE 285  INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING 3
or INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING
PH 201 or PH 211  *GENERAL PHYSICS or GENERAL PHYSICS WITH CALCULUS 4-5
WSE 250  CAD: COMPUTER AIDED DESIGN 3

Hours 14-15

Winter

ECON 202  *INTRODUCTION TO MACROECONOMICS 4
PH 202 or PH 212  *GENERAL PHYSICS or GENERAL PHYSICS WITH CALCULUS 5
WSE 210  *RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION 4
WR 214 or WR 327  *WRITING IN BUSINESS or *TECHNICAL WRITING 3

Hours 16

Spring

FES 240  *FOREST BIOLOGY 4
IE 255 or ST 314  INTRODUCTORY QUANTITATIVE ANALYSIS OF INDUSTRIAL AND MANUFACTURING SYSTEMS or INTRODUCTION TO STATISTICS FOR ENGINEERS 3
PH 203 or PH 213  *GENERAL PHYSICS or *GENERAL PHYSICS WITH CALCULUS 4-5
WSE 225  DEVELOPMENTS OF BUILDING DESIGN WITH RENEWABLE MATERIALS 3

Hours 14-15

Third Year

Fall

BA 215  FUNDAMENTALS OF ACCOUNTING 4
WSE 320  ANATOMY OF RENEWABLE MATERIALS 3
WSE 321  CHEMISTRY OF RENEWABLE MATERIALS 3
WSE 455  INDUSTRIAL MARKETING IN THE FOREST SECTOR 3

Hours 13

Winter

IE 366  WORK SYSTEMS ENGINEERING 4
WSE 322  PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS 4
WSE 350  SECONDARY PRODUCTS DESIGN AND MANUFACTURING 3
Bacc Core: Literature & the Arts 3-4

Hours 14-15

Spring

ENGR 390  ENGINEERING ECONOMY 3
WSE 324  RENEWABLE MATERIALS LABORATORY 3
WSE 351  *ADVANCED CAD: COMPUTER AIDED DESIGN 3
Bacc Core: Contemp. Global Issues 3-4
Elective 3-4

Hours 15-17

Fourth Year

Fall

IE 367  PRODUCTION PLANNING AND CONTROL 4
Bacc Core: Difference, Power, and Discrimination 3-4
Elective 3-4
WSE 450  ENTREPRENEURIAL PRODUCT DEVELOPMENT I 3
WSE 453  *FOREST PRODUCTS BUSINESS 3
WSE 462  ADVANCED MANUFACTURING 1 4
Bacc Core: Western Culture 3-4

Hours 19-21

Winter

WSE 450  ENTREPRENEURIAL PRODUCT DEVELOPMENT I 3
WSE 453  *FOREST PRODUCTS BUSINESS 3
WSE 462  ADVANCED MANUFACTURING 1 4
Bacc Core: Western Culture 3-4

Hours 16-18

Spring

WSE 425  TIMBER TECTONICS IN THE DIGITAL AGE 4
WSE 451  ENTREPRENEURIAL PRODUCT DEVELOPMENT II 3
WSE 463  ADVANCED MANUFACTURING 2 4
Bacc Core: Science, Tech & Society 3-4

Hours 14-15

Total Hours 178-189

Art and Design Option

This option is offered within the following major(s):

- Renewable Materials - College of Forestry (p. 567)

The Art and Design (A&D) option prepares students to engage with renewable materials on an aesthetic level, whether as interior designers, fine artists, or entrepreneurs. Students will gain not only an in-depth knowledge of renewable materials but also how these materials can function visually within the human space. In addition to the aesthetic aspect, students will gain an understanding of green building materials and green architecture. Students in the A&D option may also earn a visual arts minor by completing 31 credits of applicable course work.

Option Code: 478

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<tr>
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<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
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<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
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<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
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<tr>
<td>ART 234</td>
<td>DRAWING II/FIGURE</td>
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<tr>
<td>ART 291</td>
<td>SCULPTURE I</td>
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<td>DSGN 121</td>
<td>COMPUTER AIDED DESIGN</td>
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<tr>
<td>MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
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<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
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<td>ST 202</td>
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<td>WSE 211</td>
<td>WOODTURNING WITH SCIENCE I</td>
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<td>WSE 266</td>
<td>*INDUSTRIAL HEMP</td>
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<td>ADVANCED CAD: COMPUTER AIDED DESIGN</td>
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<tr>
<td>WSE 352</td>
<td>CAM FOR THE CNC ROUTER AND LASER ENGRAVER</td>
<td>3</td>
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<tr>
<td>WSE 392</td>
<td>BAMBOOLOOZA: THE FASCINATING WORLD OF BAMBOO</td>
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<tr>
<td>WSE 414</td>
<td>*ART AND DESIGN CAPSTONE</td>
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</table>

Approved Area of Concentration
A 24-credit program of study proposed by the student and approved by the WSE Department Head, including 12 upper division studio credits plus 12 credits of Restricted Electives from the list below.

**Restricted Electives**

- ART 101 *INTRODUCTION TO THE VISUAL ARTS
- ART 121 DIGITAL CORE STUDIO
- ART 208 *INTRODUCTION TO ASIAN ART
- ART 215 COLOR IN THE VISUAL ARTS
- ART 263 DIGITAL PHOTOGRAPHY
- ART 310 *EARLY CHINESE ART AND ARCHAEOLOGY
- ART 311 *LATE CHINESE ART AND CULTURE
- ART 313 *ART OF JAPAN
- ART 331 DRAWING CONCEPTS
- ART 351 INSTALLATION
- ART 367 *HISTORY OF DESIGN
- WSE 350 SECONDARY PRODUCTS DESIGN AND MANUFACTURING
- WSE 413 WOODTURNING WITH SCIENCE II
- WSE 450 ENTREPRENEURIAL PRODUCT DEVELOPMENT I
- WSE 451 ENTREPRENEURIAL PRODUCT DEVELOPMENT II
- WSE 499 SPECIAL TOPICS (Peru Study Abroad)

Total Hours: 91

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Baccalaureate Core Courses**

Not satisfied by the Renewable Materials core or the option.

Courses meeting other Baccalaureate requirements for the following categories not specified by the Renewable Materials Core or the option can be found in the OSU Catalog (https://catalog.oregonstate.edu/).

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<tr>
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<tr>
<td>Cultural Diversity (If not met by a Restricted Elective)</td>
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<tr>
<td>Difference, Power, and Discrimination</td>
<td>3</td>
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<tr>
<td>Western Culture Or Social Processes and Institutions</td>
<td>3</td>
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<tr>
<td>Contemporary Global Issues</td>
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</table>

Total Hours: 15

Plus additional Free Electives sufficient to ensure 180 total credits (60 must be upper division)

Completion of the A&D option and meeting additional studio and grade requirements will fulfill the requirements for a transcript-visible Visual Arts minor.

**Option Code: 478**

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<tr>
<th>Course</th>
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<tr>
<td>Fall</td>
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<tr>
<td>CH 121</td>
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<tr>
<td>or COMM 111</td>
<td>or *PUBLIC SPEAKING</td>
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<tr>
<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>FOR 111</td>
<td>INTRODUCTION TO FORESTRY</td>
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<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA (if math placement not high enough for MTH 245 or Free elective (3–4))</td>
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<td>Winter</td>
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<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
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| Spring | | |
| MTH 245 | *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES | 4 |
| WR 121 | *ENGLISH COMPOSITION | 3 |
| WSE 111 | RENEWABLE MATERIALS FOR A GREEN PLANET | 2 |
| | Hours: 18 |
| | |
| Second Year | | |
| Fall | | |
| ART 117 | 3-D CORE STUDIO | 4 |
| ART 131 | DRAWING CORE STUDIO | 4 |
| DSGN 121 | COMPUTER AIDED DESIGN | 3 |
| FOR 112 | COMPUTING APPLICATIONS IN FORESTRY | 3 |
| HHS 231 | *LIFETIME FITNESS FOR HEALTH | 2 |
| | Physical Activity Course | 1 |
| | Hours: 17 |
| Winter | | |
| ST 201 | PRINCIPLES OF STATISTICS | 4 |
| WR 214 | *WRITING IN BUSINESS | 3 |
| or WR 327 | or *TECHNICAL WRITING | |
| WSE 210 | *RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION | 4 |
| | Restricted Elective (3–4) | 3-4 |
| | Hours: 14-15 |
| | | |
| Third Year | | |
| Fall | | |
| WSE 320 | ANATOMY OF RENEWABLE MATERIALS | 3 |
| WSE 321 | CHEMISTRY OF RENEWABLE MATERIALS | 3 |
| WSE 322 | DEPARTMENT OF BUILDING DESIGN WITH RENEWABLE MATERIALS | 3 |
| WSE 266 | *INDUSTRIAL HEMP | 3 |
| | Hours: 14 |
| Winter | | |
| WSE 322 | PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS | 4 |
| WSE 392 | *BAMBOOLOOZA: THE FASCINATING WORLD OF BAMBOO | 3 |
| Difference, Power, and Discrimination | | |
| Social Processes and Institutions | | |
| Baccalaureate Core course (3–4) | 3-4 |
| Restricted Elective (3–4) | 3-4 |
| | Hours: 15-18 |
| | | |
| Fourth Year | | |
| Fall | | |
| WSE 352 | CAM FOR THE CNC ROUTER AND LASER ENGRAVER | 3 |
| WSE 465 | RENEWABLE MATERIALS MANUFACTURING EXPERIENCE | 2 |
| | Hours: 12-14 |
Management and Marketing Option

This option is offered within the following major(s):

• Renewable Materials - College of Forestry (p. 567)

The option provides students with the skills to manage organizations to be competitive in the global renewable materials marketplace or develop innovative and effective marketing programs for green products.

Option Code: 288

<table>
<thead>
<tr>
<th>Code</th>
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<td>BA 213</td>
<td>MANAGERIAL ACCOUNTING</td>
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<td>BA 230</td>
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<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
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<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
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<td>BA 350</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
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<td>BA 390</td>
<td>MARKETING</td>
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<td>*INTRODUCTION TO MICROECONOMICS</td>
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<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
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<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
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<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
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<td>BIO-BASED PRODUCTS MANUFACTURING</td>
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<td>ADVANCED MANUFACTURING 1</td>
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<td>WSE 471</td>
<td>RENEWABLE MATERIALS IN BUILDING CONSTRUCTION</td>
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|         | Select a minimum of 12 credits of the following:  
| AEC 352 | *ENVIRONMENTAL ECONOMICS AND POLICY        | 12    |
| or ECON 352| *ENVIRONMENTAL ECONOMICS AND POLICY    |       |
| BA 357  | OPERATIONS MANAGEMENT                      |       |
| BA 432  | *ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS|       |
| BA 451  | SUPPLY AND SOURCING MANAGEMENT             |       |
| BA 458  | INNOVATION AND NEW PRODUCT DEVELOPMENT     |       |
| BA 460  | VENTURE MANAGEMENT                         |       |
| ECON 340| INTERNATIONAL ECONOMICS                    |       |
| FES 241 | DENDROLOGY                                 |       |

Baccalaureate Core Courses

Not satisfied by the Renewable Materials core or the option.

Courses meeting other Baccalaureate requirements for the following categories not specified by the Renewable Materials Core or the option can be found in the OSU Catalog online at https://catalog.oregonstate.edu/

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<td>Literature and Arts</td>
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<td>Western Culture</td>
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<td>Science, Technology, and Society Synthesis</td>
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<td>Contemporary Global Issues</td>
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<td></td>
<td>Plus additional Free Electives sufficient to ensure 180 total credits (60 must be upper division)</td>
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Note: Completion of the Management and Marketing option and meeting additional grade requirements of the College of Business will fulfill the requirements for a transcript-visible Business and Entrepreneurship minor. Students who graduate and complete the minor may also apply to the College of Business to enroll in a 58-credit, four-term MBA degree program.

Option Code: 288

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<td>FOR 112 COMPUTING APPLICATIONS IN FORESTRY</td>
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<td>MTH 241 *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
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</table>
Science and Engineering Option

This option is offered within the following major(s):

- Renewable Materials - College of Forestry (p. 567)

This is a flexible, math- and science-intensive program that allows students to design a personalized curriculum that opens doors to jobs that solve complex problems, create efficiencies, foster intelligent use of renewable materials, or to graduate school. Students select a group of courses (often minors) that complement their interests.

Option Code: 289

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<td>MTH 254 VECTOR CALCULUS I</td>
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<td>PH 202 *GENERAL PHYSICS</td>
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<td>PH 203 *GENERAL PHYSICS</td>
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<td>or PH 213</td>
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<td>ST 314 INTRODUCTION TO STATISTICS FOR ENGINEERS</td>
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<td>WSE 463 RENEWABLE MATERIALS MANUFACTURING EXPERIENCE</td>
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<td>WSE 471 RENEWABLE MATERIALS IN BUILDING CONSTRUCTION</td>
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<td>WSE 473 BIOENERGY AND ENVIRONMENTAL IMPACT</td>
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<td>Approved Area of Concentration</td>
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<tr>
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<td>Approved 'Area of Concentration' — A 24-credit program of study proposed by the student and approved by the WSE Department Head (minimum of 12 upper-division credits)</td>
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<td>Total Hours</td>
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<tr>
<td></td>
<td>^ Writing Intensive Course (WIC)</td>
<td></td>
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</tbody>
</table>

| Spring | DSGN 121 COMPUTER AIDED DESIGN                             | 3     |
|        | ECON 201 *INTRODUCTION TO MICROECONOMICS                   | 4     |
|        | HHS 231 *LIFETIME FITNESS FOR HEALTH                       | 2     |
|        | WR 121 *ENGLISH COMPOSITION                                | 3     |
| Physical Activity Course (1)                             | 1     |
| Elective (3–4)                                           | 3-4   |
| Hours                                                 | 16-17 |

Second Year

| Fall | BA 211 FINANCIAL ACCOUNTING                               | 4     |
|      | ECON 202 *INTRODUCTION TO MACROECONOMICS                  | 4     |
|      | FES 240 *FOREST BIOLOGY                                   | 4     |
|      | WSE 250 CAD: COMPUTER AIDED DESIGN                         | 3     |
| Hours                                           | 15     |

Winter

| BA 213 | MANAGERIAL ACCOUNTING                                    | 4     |
| BA 230 | BUSINESS LAW I                                           | 4     |
| ST 351 | INTRODUCTION TO STATISTICAL METHODS                      | 4     |
| WSE 210 | *RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION         | 4     |
| Hours                                           | 16     |

Spring

| BA 260 | INTRODUCTION TO ENTREPRENEURSHIP                         | 4     |
| ST 352 | INTRODUCTION TO STATISTICAL METHODS                      | 4     |
| WR 214 | *WRITING IN BUSINESS                                      | 3     |
| WR 327 | *TECHNICAL WRITING                                       | 3     |
| WSE 225 | DEVELOPMENTS OF BUILDING DESIGN WITH RENEWABLE MATERIALS | 3     |
| Hours                                           | 17     |

Third Year

| Fall | BA 351 | MANAGING ORGANIZATIONS                                   | 4     |
|      | WSE 320 | ANATOMY OF RENEWABLE MATERIALS                           | 3     |
|      | WSE 321 | CHEMISTRY OF RENEWABLE MATERIALS                         | 3     |
|      | WSE 455 | INDUSTRIAL MARKETING IN THE FOREST SECTOR                 | 3     |
|      | Restricted Elective (3–4)                                | 3-4   |
| Hours                                           | 14-16  |

Winter

| BA 360 | INTRODUCTION TO FINANCIAL MANAGEMENT                      | 4     |
| WSE 322 | PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS | 4     |
| Restricted Elective (3–4)                        | 3-4   |
| Literature and the Arts Baccalaureate Core course (3–4) | 3-4   |
| Hours                                           | 14-16  |

Spring

| BA 390 | MARKETING                                                  | 4     |
| WSE 324 | RENEWABLE MATERIALS LABORATORY                            | 3     |
| Restricted Elective (4)                          | 4     |
| Upper Division Area of Concentration course (3–4) | 3-4   |
| Hours                                           | 14-15  |

Fourth Year

| Fall | WSE 461 BI0-BASED PRODUCTS MANUFACTURING                   | 4     |
|      | WSE 465 RENEWABLE MATERIALS MANUFACTURING EXPERIENCE       | 2     |
| Upper Division Area of Concentration course (3–4)       | 3-4   |
| Difference, Power, and Discrimination Baccalaureate Core course (3–4) | 3-4   |
| Western Culture Baccalaureate Core course (3–4)          | 3-4   |
| Hours                                           | 15-18  |

Winter

| WSE 453 | *FOREST PRODUCTS BUSINESS                                 | 3     |
|          | WSE 462 ADVANCED MANUFACTURING 1                          | 4     |
|          | Upper Division Area of Concentration course (3–4)         | 3-4   |
|          | Contemporary Global Issues Baccalaureate Core course (3–4) | 3-4   |
|          | Hours                                                    | 13-15 |

| Fall | WSE 471 RENEWABLE MATERIALS IN BUILDING CONSTRUCTION      | 3     |
|      | Area of Concentration Course (3–4)                       | 3-4   |
|      | Cultural Diversity Baccalaureate Core course (3–4)       | 3-4   |
|      | Science, Technology, and Society Baccalaureate Core course (3–4) | 3-4   |
|      | Elective (3–4)                                           | 3-4   |
| Hours                                           | 15-19  |

Total Hours 180-194
Baccalaureate Core Courses

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Courses meeting other baccalaureate core requirements for the following categories not specified by the Renewable Materials Core or the option can be found in the OSU Catalog online at https://catalog.oregonstate.edu/

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<tr>
<th>Code</th>
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<tr>
<td>Cultural Diversity</td>
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Plus additional Free Electives sufficient to ensure 180 total credits (60 must be upper division).

Option Code: 289

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<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>IE 285 or MFGE 285</td>
<td>INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>PH 201 or PH 211</td>
<td>*GENERAL PHYSICS or *GENERAL PHYSICS WITH CALCULUS</td>
<td>5</td>
</tr>
<tr>
<td>WSE 250</td>
<td>CAD: COMPUTER AIDED DESIGN</td>
<td>3</td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>PH 202 or PH 212</td>
<td>*GENERAL PHYSICS or *GENERAL PHYSICS WITH CALCULUS</td>
<td>5</td>
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<tr>
<td>WR 214 or WR 327</td>
<td>*WRITING IN BUSINESS or *TECHNICAL WRITING</td>
<td>3</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSE 320</td>
<td>ANATOMY OF RENEWABLE MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>WSE 321</td>
<td>CHEMISTRY OF RENEWABLE MATERIALS</td>
<td>3</td>
</tr>
<tr>
<td>Area of Concentration course (4)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Western Culture Baccalaureate Core (3–4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 215</td>
<td>FUNDAMENTALS OF ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>WSE 322</td>
<td>PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS</td>
<td>4</td>
</tr>
<tr>
<td>Area of Concentration course (4)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Literature and the Arts Baccalaureate Core course (3–4)</td>
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<td>3-4</td>
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<tr>
<td><strong>Fourth Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSE 461</td>
<td>BIO-BASED PRODUCTS MANUFACTURING</td>
<td>4</td>
</tr>
<tr>
<td>WSE 465</td>
<td>RENEWABLE MATERIALS MANUFACTURING EXPERIENCE</td>
<td>2</td>
</tr>
<tr>
<td>Area of Concentration course (4)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Difference, Power, and Discrimination Baccalaureate Core course (3–4)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSE 430</td>
<td>FUNDAMENTALS OF ENGINEERING MECHANICS</td>
<td>4</td>
</tr>
<tr>
<td>WSE 453</td>
<td>*FOREST PRODUCTS BUSINESS</td>
<td>3</td>
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<tr>
<td>WSE 462</td>
<td>ADVANCED MANUFACTURING 1</td>
<td>4</td>
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<tr>
<td>Area of Concentration course (3–4)</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSE 471</td>
<td>RENEWABLE MATERIALS IN BUILDING CONSTRUCTION</td>
<td>3</td>
</tr>
<tr>
<td>WSE 473</td>
<td>BIOENERGY AND ENVIRONMENTAL IMPACT</td>
<td>3</td>
</tr>
<tr>
<td>Area of Concentration Course (4)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Cultural Diversity Baccalaureate Core course (3–4)</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Science, Technology, and Society Baccalaureate Core course (3–4)</td>
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<td>3-4</td>
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<tr>
<td><strong>Total Hours</strong></td>
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<td>173-178</td>
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</tbody>
</table>

Wood Science Graduate Major (MS, PhD)

Graduate Areas of Concentration

Biodegradation and materials protection, chemistry and chemical processing, forest products business and marketing, physics and moisture relations, process modeling and analysis, renewable materials science and
**Engineered composites, wood anatomy and quality, wood engineering and mechanics**

The Department of Wood Science and Engineering offers graduate programs leading toward the Master of Science and Doctor of Philosophy degrees in Wood Science. Thesis research and academic programs can be developed in the many special disciplines represented by the faculty. Minors are most commonly selected from statistics, engineering, chemistry, or business.

Many students pursue a dual major degree in wood science and a field of engineering or science. A wide variety of science, engineering and business opportunities are available.

Graduate students in wood science come from a wide range of undergraduate degree programs in science, engineering, and business.

Excellent laboratories are available for teaching and research in Richardson Hall, Peavy Hall, Emmerson Advanced Wood Products Laboratory, and the Oak Creek Laboratory. Student research involves seeking solutions to current problems in renewable materials science, other sciences such as chemistry, physics and biology, engineering, business or related fields. Most graduate students are employed as part-time graduate assistants.

Graduates with advanced degrees find employment in research and development, management or technical positions in the private sector, as university faculty or in technical public service positions.

**Major Code: 3690**

### MS in Wood Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSE 503</td>
<td>THESIS</td>
<td>6-12</td>
</tr>
<tr>
<td>WSE 507</td>
<td>SEMINAR (Section 1 Required to be taken during 1st year)</td>
<td>1</td>
</tr>
<tr>
<td>WSE 507</td>
<td>SEMINAR (Section 2)</td>
<td>1</td>
</tr>
<tr>
<td>WSE 520</td>
<td>THE GLOBAL CONTEXT OF THE FOREST SECTOR</td>
<td>3</td>
</tr>
<tr>
<td>WSE 521</td>
<td>WOOD SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>WSE 522</td>
<td>WOOD SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>Select a minimum of 15 credits of integrated minor course work or outside minor course work</td>
<td>15</td>
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</tr>
<tr>
<td>Additional approved courses</td>
<td>6-8</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours**: 40-48

1. Course work to be determined by your committee at program of study meeting.
2. Approved courses include all 500- and 600-level courses in Wood Science and Engineering.

### PhD in Wood Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSE 520</td>
<td>THE GLOBAL CONTEXT OF THE FOREST SECTOR</td>
<td>3</td>
</tr>
<tr>
<td>WSE 521</td>
<td>WOOD SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>WSE 522</td>
<td>WOOD SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>WSE 603</td>
<td>THESIS</td>
<td>36</td>
</tr>
<tr>
<td>WSE 607</td>
<td>SEMINAR (Section 1 Required to be taken during 1st year)</td>
<td>1</td>
</tr>
<tr>
<td>WSE 607</td>
<td>SEMINAR (Section 2 To be taken twice)</td>
<td>2</td>
</tr>
<tr>
<td>Select a minimum of 18 credits of integrated minor course work or outside minor course work</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours**: 108

1. Course work to be determined by your committee at program of study meeting
2. Approved courses include all 500- and 600-level courses in Wood Science and Engineering

**Major Code: 3690**

### Wood Science Graduate Minor

If a Wood Science minor is desired, you should first select a minor professor within the Wood Science & Engineering department, and work with them to identify an appropriate set of courses within Wood Science to meet or exceed 15 credits.

**Major Code: 3690**

### College of Liberal Arts

The College of Liberal Arts offers major programs in the arts, humanities, and social sciences that comprise the core of human knowledge. Students can earn degrees and minors in the college's many disciplines and interdisciplinary programs, as well as certificates of specialized training in seven other fields. Qualified students can also participate in a joint program with the College of Law at Willamette University, in which they can earn their bachelor's and law degrees in six years.

200 Bexell Hall
Oregon State University
Corvallis, OR 97331-6202
Phone: 541-737-0561
Website: http://liberalarts.oregonstate.edu

**Administration**

- **Lawrence R. Rodgers**, Dean, 541-737-4581, larry.rogers@oregonstate.edu
- **Marion Rossi**, Associate Dean, 541-737-4917, mrossi@oregonstate.edu
- **Suzanne Grey**, Executive Assistant, 541-737-8809, suzanne.grey@oregonstate.edu
- **Peggy Spiegelberg**, Administrative Assistant, 541-737-1228, peggy.spiegelberg@oregonstate.edu
- **Celene Carillo**, Communications Director, 541-737-2137, celene.carillo@oregonstate.edu
- **John Edwards**, Associate Dean of Student Services, 541-737-8571, john.edwards@oregonstate.edu
- **Tristen Shay**, Associate Director of Student Services, 541-737-0561, tristen.shay@oregonstate.edu

**Double Degrees**

Undergraduates with majors in the College of Liberal Arts can earn a second degree in education, innovation management, international studies, or sustainability. See the College of Education (https://catalog.oregonstate.edu/college-departments/education/), College of Business (https://catalog.oregonstate.edu/college-departments/business/), International Programs (https://catalog.oregonstate.edu/college-departments/international-programs/) or Department of Forest Ecosystems and Society (https://catalog.oregonstate.edu/college-
Law school is one of the few professional schools that attend some of the finest schools in the nation. Students interested in attending law school. Our accomplished graduates at Willamette University College of Law and Lewis and Clark College Law School. Students may be admitted to the program any time during their first two years of undergraduate study provided they have a 3.5 high school GPA and a minimum combined SAT score of 1950 or composite ACT score of 29. Students will complete all but 45 credits of upper-division electives for a BA or BS degree in defined majors in the College of Liberal Arts. For admission to law school, students must have earned a cumulative GPA of 3.4 or higher and a Law School Admission Test (LSAT) score no lower than the median LSAT for the prior year’s entering class. At Willamette University and at Lewis & Clark College, the students’ first-year law courses will satisfy the 45-credit upper-division elective requirements for their OSU degree. After completing the additional two years at Willamette or at Lewis & Clark, students will have completed both the bachelors and JD degrees in six years. OSU Honors College students are currently not eligible for this program due to the senior year thesis requirement. OSU Honors College students are currently not eligible for this program due to the senior year thesis requirement.

The College of Liberal Arts offers many courses in the arts, humanities, and social sciences that are of value to all students and are basic to a liberal education. Such courses help students in their personal development and enrichment through a deeper understanding of themselves and appreciation of human cultural development.

Teacher Education

The College of Liberal Arts offers excellent undergraduate preparation for elementary, middle or high school teachers. The Liberal Studies pre-education program is ideal for elementary school teachers.

Students wanting to teach at the high school level may major in English, French, German, history/social studies, music or Spanish.

Certificate Programs

Certificate programs in Applied Ethics; Food in Culture and Social Justice; Language in Culture; Latin American Affairs; Medical Humanities; Peace Studies; Religion and Culture; and Women, Gender, and Sexuality Studies are offered to all students and may be taken concurrently with any major degree program.

Pre-Law Preparation

OSU provides opportunities for a complete and rigorous preparation for students interested in attending law school. Our accomplished graduates attend some of the finest schools in the nation.

Law school is one of the few professional schools that do not require a particular set of courses as a prerequisite for admission. Students may major in any subject. Students should choose a major that engages and challenges them, a course of study where they can excel. They are advised to supplement their major courses with a diverse selection of classes that offer depth, rigor, and skill in three areas: written and oral communication, deductive reasoning and logic, and a general knowledge of the institutions and values of our society.

The College of Liberal Arts offers many effective and engaging ways to prepare for law school, rather than one single pre-law program. Students interested in law school may contact Professor Jason Tanenbaum in the School of Public Policy. Call 541-737-3663 for his office hours. Students also may call the CLA Student Services Office, 541-737-0561. Students should also obtain the College of Liberal Arts pre-law advising brochure, which is available online (http://liberalarts.oregonstate.edu/content/pre-law-program/).

Accelerated BA/BS and Law (JD) Program with Willamette University College of Law and Lewis and Clark College Law School

This program enables OSU students to earn a BA or BS degree and a law degree in a total of six years, three years at OSU and three at either the Willamette University College of Law or the Lewis and Clark College Law School.

Students may be admitted to the program any time during their first two years of undergraduate study provided they have a 3.5 high school GPA and a minimum combined SAT score of 1950 or composite ACT score of 29. Students will complete all but 45 credits of upper-division electives for a BA or BS degree in defined majors in the College of Liberal Arts. For admission to law school, students must have earned a cumulative GPA of 3.4 or higher and a Law School Admission Test (LSAT) score no lower than the median LSAT for the prior year’s entering class.

At Willamette University and at Lewis & Clark College, the students’ first-year law courses will satisfy the 45-credit upper-division elective requirements for their OSU degree. After completing the additional two years at Willamette or at Lewis & Clark, students will have completed both the bachelors and JD degrees in six years.

OSU Honors College students are currently not eligible for this program due to the senior year thesis requirement.

1 American Studies (OSU-Cascades Branch Campus in Bend); Anthropology; Economics; English; Ethnic Studies; French; German; History; Philosophy; Political Science; Sociology; Spanish; Speech Communication; Women, Gender, and Sexuality Studies

Academic Advising

Mission Statement: The College of Liberal Arts academic advising is a teaching and learning process dedicated to student success. Academic advising engages students in developing a plan to realize their educational, career and life goals.

Values Statement: The values associated with advising in the College of Liberal Arts are closely aligned with the stated values of the university.

• Accountability: We are committed to providing timely, accurate and intentional advising.
• Diversity: We honor the unique nature and interests of each student. Advising services and delivery methods will be shaped to fit the diverse needs of our campus populations.
• Respect: We seek to establish a reciprocal relationship with students based on an ethic of care and shared responsibility.
• Social Responsibility: We foster a culture of independent thinking and global awareness so that students make informed, socially responsible choices consistent with their academic, career and life goals.
• Integrity: We seek to engage students in a fair and professional process of meaningful self-reflection and authentic inquiry.

A liberal arts education involves exploration and broad study beyond one’s major field. Students are encouraged to understand other cultures, other ways of knowing, and other fields of study. Students are also encouraged to take more courses in areas outside their major field to enhance their experience.
Liberal Arts students are required to satisfy four sets of requirements:

- Oregon State University Baccalaureate Core
- College of Liberal Arts Core
- BA or BS requirements
- Major program requirements

The University Baccalaureate Core course requirements are explained in a separate section Earning a Degree at Oregon State (p. 1609). The College of Liberal Arts Core and the BA and BS requirements are explained below. The major program requirements are explained in the appropriate section in the pages that follow. If you want to add a minor program, you will also need to complete the requirements for that minor. Specific requirements for interdisciplinary minors are listed in the Interdisciplinary Programs section of this catalog. Specific requirements for disciplinary minors are usually given in the appropriate school or departmental section; for example see the School of Public Policy section for requirements for the Economics minor.

You may not use a single course to satisfy more than one of these requirements. In addition, you may not use courses within your major field to satisfy either baccalaureate core or liberal arts core requirements. (However, courses taken to satisfy the baccalaureate core requirements or the liberal arts core may also be used to satisfy requirements for a minor.)

**Liberal Arts Core**

The liberal arts core consists of five courses (at least 15 credits) as follows:

- **Humanities (3):** Critical examination of influential traditions and ideas as defined by major scholarly works (includes English literature; ethnic studies; film studies; foreign language and literatures, including culture; history; and philosophy).
- **Fine Arts (3):** Participation in or appreciation of different forms (includes art, music, theater, and creative writing in poetry, fiction, creative nonfiction, or drama).
- **Social Science (3):** Scientific investigation and theory pertaining to human individuals, social groups, institutions, and ideologies (includes anthropology; economics; political science; psychology; sociology; women, gender, and sexuality studies; and selected geography courses).
- **Nonwestern Culture (3):** Study in any of the following areas focusing outside of Western culture—Africa, Asia, Russia, South America, Central America, Caribbean, Middle East, the Pacific, or Native North Americans.
- **One additional course** from one of the preceding areas (3).

**BA/BS Requirements**

Nearly all liberal arts students graduate with either a bachelor of arts or bachelor of science degree.

- **BA Requirement:** Second-year proficiency in a second language, including ASL, at the college level with at least a C–.
- **BS Requirement:** A minimum 15-credit block of science, computer science, and quantitative studies as follows:
  - Any computer science (CS) course approved by the student’s major school or department (3–4), and
  - a. Any course from the College of Science approved by the student’s major school or department except math (MTH) or statistics (ST) courses (3–4), and
  - b. Any course from the College of Science approved by the student’s major school or department except math (MTH) or statistics (ST) courses (3–4), and
  - c. One of the following (8–12):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>8</td>
</tr>
<tr>
<td>&amp; ST 352</td>
<td>and INTRODUCTION TO STATISTICAL METHODS</td>
<td></td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>8</td>
</tr>
<tr>
<td>&amp; MTH 245</td>
<td>and *MATHEMATICS FOR MANAGEMENT, LIFE,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AND SOCIAL SCIENCES</td>
<td></td>
</tr>
<tr>
<td>Any 8 credits of MTH courses at the 200 level or above (not including MTH 211 and MTH 212)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 211</td>
<td>*FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>12</td>
</tr>
<tr>
<td>&amp; MTH 212</td>
<td>and FOUNDATIONS OF ELEMENTARY</td>
<td></td>
</tr>
<tr>
<td>&amp; MTH 390</td>
<td>MATHEMATICS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Pre-elementary education majors only)</td>
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Select the following: 12

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>12</td>
</tr>
<tr>
<td>MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
<td></td>
</tr>
<tr>
<td>or MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td></td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>8</td>
</tr>
</tbody>
</table>

Many schools or departments require specific courses to satisfy the BS degree requirements; students should consult their academic advisors for details. Courses used to satisfy the BS degree requirements may not also be used to satisfy baccalaureate core requirements. Bachelor of Fine Arts (BFA) degrees in Digital Communication Arts and Graphic Design are offered by the School of Arts and Communication. BFA degree requirements differ from those in other College of Liberal Arts programs. Students in the BFA degree program must complete the baccalaureate core and a minimum of 105 credits in art or digital communication arts.

**Liberal Arts students are required to satisfy four sets of requirements:**

- Oregon State University Baccalaureate Core
- College of Liberal Arts Core
- BA or BS requirements
- Major program requirements

The Liberal Arts Core consists of five courses (at least 15 credits) as follows:

- **Humanities (3):** Critical examination of influential traditions and ideas as defined by major scholarly works (includes English literature; ethnic studies; film studies; foreign language and literatures, including culture; history; and philosophy).
- **Fine Arts (3):** Participation in or appreciation of different forms (includes art, music, theater, and creative writing in poetry, fiction, creative nonfiction, or drama).
- **Social Science (3):** Scientific investigation and theory pertaining to human individuals, social groups, institutions, and ideologies (includes anthropology; economics; political science; psychology; sociology; women, gender, and sexuality studies; and selected geography courses).
- **Nonwestern Culture (3):** Study in any of the following areas focusing outside of Western culture—Africa, Asia, Russia, South America,
Below you will find a list of courses that will fulfill each section of our Liberal Arts Core. Students must take a minimum of 3 credits/1 course for each of the five Liberal Arts Core sections.

### Humanities

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ART 204</td>
<td>*INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td>3</td>
</tr>
<tr>
<td>ART 205</td>
<td>*INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE</td>
<td>3</td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
<td>3</td>
</tr>
<tr>
<td>COMM 314</td>
<td>ARGUMENTATION</td>
<td>3</td>
</tr>
<tr>
<td>COMM 316</td>
<td>ADVANCED PERSUASION</td>
<td>3</td>
</tr>
<tr>
<td>COMM 320</td>
<td>INTRODUCTION TO RHETORICAL THEORY</td>
<td>3</td>
</tr>
<tr>
<td>COMM 372</td>
<td>VISUAL RHETORIC</td>
<td>3</td>
</tr>
<tr>
<td>COMM 380</td>
<td>IMAGE AND MYTH IN FILM</td>
<td>3</td>
</tr>
<tr>
<td>COMM 385</td>
<td>COMMUNICATION AND CULTURE IN CYBERSPACE</td>
<td>3</td>
</tr>
<tr>
<td>COMM 454</td>
<td>ADVANCED ARGUMENTATION</td>
<td>3</td>
</tr>
<tr>
<td>COMM 456</td>
<td>*RHETORIC: 500 BC TO 500 AD</td>
<td>3</td>
</tr>
<tr>
<td>COMM 458</td>
<td>*RHETORIC: 500 AD TO 1900</td>
<td>3</td>
</tr>
<tr>
<td>COMM 459</td>
<td>*CONTEMPORARY THEORIES OF RHETORIC</td>
<td>3</td>
</tr>
<tr>
<td>COMM 460</td>
<td>RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1750 TO 1900</td>
<td>3</td>
</tr>
<tr>
<td>COMM 462</td>
<td>RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1900-PRESENT</td>
<td>3</td>
</tr>
<tr>
<td>COMM 466</td>
<td>ETHICS OF RHETORIC</td>
<td>3</td>
</tr>
<tr>
<td>COMM 472</td>
<td>THE RHETORIC OF POPULAR CULTURE</td>
<td>3</td>
</tr>
<tr>
<td>COMM 476</td>
<td>ISSUES IN THE FREEDOM OF SPEECH</td>
<td>3</td>
</tr>
<tr>
<td>COMM 478</td>
<td>POLITICAL CAMPAIGN RHETORIC</td>
<td>3</td>
</tr>
<tr>
<td>ENG 104</td>
<td>*INTRODUCTION TO LITERATURE: FICTION</td>
<td>3</td>
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<tr>
<td>ENG 104H</td>
<td>*INTRODUCTION TO LITERATURE: FICTION</td>
<td>3</td>
</tr>
<tr>
<td>ENG 105</td>
<td>*INTRODUCTION TO LITERATURE: DRAMA</td>
<td>3</td>
</tr>
<tr>
<td>ENG 106</td>
<td>*INTRODUCTION TO LITERATURE: POETRY</td>
<td>3</td>
</tr>
<tr>
<td>ENG 106H</td>
<td>*INTRODUCTION TO LITERATURE: POETRY</td>
<td>3</td>
</tr>
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<td>THE SOCIETY OF GLOBALIZATION</td>
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<td>INTERNATIONAL DEVELOPMENT: GENDER ISSUES</td>
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</table>

American Studies Program
American Studies is only offered on the OSU-Cascades Campus in Bend, Oregon.

Undergraduate Programs
Major

- American Studies (p. 582)

Neil Browne, Director
Tykeson Hall 302D
OSU-Cascades Campus
1500 SW Chandler Avenue
Bend, OR 97702
Phone: 541-322-3129
Email: neil.browne@osucascades.edu
Website: http://osucascades.edu/academics/american-studies (http://osucascades.edu/academics/american-studies/)

American Studies Program

AMS 311. TOPICS IN AMERICAN STUDIES. (4 Credits)
Selected topics, changed annually, that investigate American ideas, regions, events, or periods. Fulfills the requirement for an integrated course in the major. May be repeated as topics vary. Open to nonmajors. This course is repeatable for 99 credits.

AMS 350. *AMERICAN CULTURE AND THE VIETNAM EXPERIENCE. (4 Credits)
Examines through literature, film, and popular media the effects of the Vietnam War on American culture. Taught at OSU-Cascades only. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

AMS 405. READING AND CONFERENCE. (1-16 Credits)
Independent, individual studies supervised by the director, members of the American Studies Board, or assigned professors, as arranged by the student and the director. This course is repeatable for 16 credits.
AMS 406. PROJECTS. (1-16 Credits)
Studies of American culture and society centered around topical events or cultural programs of current interest in American studies. This course is repeatable for 16 credits.

AMS 407. SEMINAR. (1-16 Credits)
CROSSLISTED as AMS 407/ENG 407. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ENG 407
This course is repeatable for 16 credits.

AMS 410. AMERICAN STUDIES INTERNSHIP. (1-16 Credits)
Supervised and evaluated work in a variety of professional fields to enhance students’ career preparation; arranged at the initiative of the student one semester in advance.
This course is repeatable for 16 credits.

AMS 507. SEMINAR. (1-16 Credits)
CROSSLISTED as AMS 507/ENG 507.
Equivalent to: ENG 507
This course is repeatable for 16 credits.

American Studies Undergraduate Major (BA, BS, HBA, HBS)

Available only at OSU-Cascades.

An interdisciplinary major that engages American culture in its historical, contemporary, and global contexts. Examines American culture through a variety of media including film, music, literature, history, politics, and art. Teaching faculty members are from several different disciplines and students approach course objectives from many scholarly vantage points.

Major Code: 865

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<td>*SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT</td>
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<td>*LITERATURE OF AMERICAN MINORITIES</td>
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* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

American Studies Final Portfolio (Must be submitted during the student’s final term)

1. Pick three essays you wrote during the course of your program in American Studies that you feel are representative of your most meaningful work. These may be your best essays, but they may be essays in which you struggled with difficult material in an attempt to better understand it. In other words, which essays are most meaningful to you in your experience earning an American Studies degree at OSU-Cascades?

2. Incorporating at least one of the American Studies Outcomes, write a three-page cover letter explaining why you chose these essays and how they reflect what you have learned and experienced in the process of earning your degree in American Studies at OSU-Cascades.
Major Code: 865

Liberal Studies Program
Undergraduate Program

Major

- Liberal Studies (p. 583)
  - Pre-Education

Dr. John Edwards, Associate Dean of Student Services
214 Bexell Hall
Oregon State University
Corvallis, OR 97331-6202
Phone: 541-737-0561
Email: jedwards@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/advising/liberal-studies

Liberal Studies

LS 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

LS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

LS 405. READING AND CONFERENCE. (1-3 Credits)
This course is repeatable for 16 credits.

LS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

LS 407. SEMINAR. (1-16 Credits)
Graduate credit must not exceed 9 credits.
This course is repeatable for 16 credits.

LS 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

LS 410. INTERNSHIP. (1-12 Credits)
Restricted to students enrolled in off-campus programs. Not available to students in residence on the Corvallis campus. Maximum of 12 credits.
This course is repeatable for 12 credits.

LS 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

The typical program is designed to meet the needs and interests of the particular student and is unique in content. In some cases, a prestructured program may provide a suitable match.

Total credits required for graduation is 180.

Major Code: 920

Pre-Education Option

This option is offered within the following major(s):

- Liberal Studies - College of Liberal Arts (p. 583)

The BA or BS degree in Liberal Studies may be used to prepare for a teacher licensure program.

Option Code: 922

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<td>Difference, Power, and Discrimination</td>
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<td>HDFS 313 ADOLESCENT DEVELOPMENT</td>
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Liberal Studies Undergraduate Major
(BA, BS, HBA, HBS)

Also available at OSU-Cascades and via Ecampus.

A BA or BS degree in Liberal Studies is available for students whose academic and career interests suggest greater curricular breadth and flexibility than is available in other major programs.

Major Code: 920

Candidates for the Liberal Studies major must complete the following:

- Oregon State University Baccalaureate Core
- College of Liberal Arts Core requirements

- A program consisting of 45 or more credits that are thematic in nature and include at least 27 upper-division credits developed from the course offerings of two or more departments within the College of Liberal Arts. The plan of study and statement of justification must be approved in advance by the head advisor or designee.
- At least one Writing Intensive Course (WIC) with a grade of C or better.
- Maintain a 2.0 or better university GPA.
- Maintain a 2.3 or better major GPA.
Other Degrees & Programs within the College of Liberal Arts

Undergraduate Programs

Major
- Social Science (p. 585)
  Option:
  • Community Development and Leadership (p. 587)

Graduate Programs

Major
- Environmental Arts and Humanities (p. 584)

Minor
- Environmental Arts and Humanities (p. 585)

Liberal Arts

LA 199. SPECIAL TOPICS. (2 Credits)
Various topics introducing students to the liberal arts. This course is repeatable for 6 credits.

LA 399. SPECIAL TOPICS. (1-12 Credits)
This course is repeatable for 12 credits.

Environmental Arts and Humanities Graduate Major (MA)

Graduate Areas of Concentration

Environmental imagination, environmental action, environmental thinking

Major Code: 8200

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAH XXX</td>
<td>Environmental Arts and Humanities Field Course (Pending submission &amp; approval)</td>
<td>3</td>
</tr>
<tr>
<td>EAH 411/EAH 511</td>
<td><strong>PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES</strong></td>
<td>4</td>
</tr>
<tr>
<td>EAH XXX</td>
<td>Environmental Science Methods and Practice</td>
<td>3</td>
</tr>
<tr>
<td>EAH XXX</td>
<td>Professional Development (Pending submission &amp; approval)</td>
<td>1</td>
</tr>
<tr>
<td>EAH XXX</td>
<td>Thesis or Project Proposal Writing for Environmental Arts and Humanities (Pending submission &amp; approval)</td>
<td>2</td>
</tr>
<tr>
<td>EAH 412/EAH 512</td>
<td><strong>ENVIRONMENTAL SCIENCE IN CONTEXT</strong></td>
<td>4</td>
</tr>
</tbody>
</table>

Environmental Arts and Humanities Core

Select three of the following with no more than one from any department:

- ART XXX. Art and Nature (Pending approval)

  COMM 412/COMM 512 | TOPICS IN SPEECH COMMUNICATION (Environmental Communication) | 2     |

  COMM XXX. The Rhetoric of Land Use (Pending submission & approval) | 2     |

- EAH XXX. Classics of American Environmental Thought (Pending submission & approval)

  ENG 482/ENG 582 | STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT       |       |

  ES XXX. Environmental Racism (Pending submission & approval) |       |

  FES 523 | QUANTITATIVE ANALYSIS IN SOCIAL SCIENCE                             |       |

  HST 481/HST 581 | **ENVIRONMENTAL HISTORY OF THE UNITED STATES**                     |       |

  HST XXX. Global Environmental History (Pending submission & approval) |       |

  PHL 440/PHL 540 | *ENVIRONMENTAL ETHICS**                                              |       |

  PHL 443/PHL 543 | *WORLD VIEWS AND ENVIRONMENTAL VALUES                                |       |

Graduate Areas of Concentration

Select one area of concentration and complete a minimum of 12 credits in that area:

Environmental Imagination

ART XXX. Art and Nature (Pending submission & approval)
ART 546 | DOCUMENTARY PHOTOGRAPHY                                              |       |
ART 562 | DIRECTIONS AND ISSUES IN CONTEMPORARY ART                            |       |
ART 569 | METHODS AND THEORY OF ART HISTORY                                    |       |
COMM 550 | COMMUNICATION AND THE PRACTICE OF SCIENCE                            |       |
COMM XXX. Environmental Rhetoric (Pending submission & approval) |       |
ENG 545 | STUDIES IN NONFICTION                                                 |       |
ENG 575 | STUDIES IN CRITICISM                                                 |       |
ENG 582 | STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT         |       |
PHL 539 | PHILOSOPHY OF NATURE                                                 |       |
WR 448/WR 548 | MAGAZINE ARTICLE WRITING                                              |       |
WR 452/WR 562 | *ENVIRONMENTAL WRITING                                               |       |
WR 525 | ADVANCED SCIENTIFIC AND TECHNICAL WRITING                             |       |

Environmental Action

AEC 532 | ENVIRONMENTAL LAW                                                    |       |
ANTH 577 | ECOLOGICAL ANTHROPOLOGY                                              |       |
COMM 412/COMM 526 | INTERCULTURAL COMMUNICATION: THEORIES AND ISSUES                     |       |
COMM 442/COMM 542 | BARGAINING AND NEGOTIATION PROCESSES                                 |       |
COMM 599 | SPECIAL TOPICS (Environmental Conflict Resolution )                  |       |
ES 560 | ETHNICITY AND SOCIAL JUSTICE                                         |       |
FW 549 | HISTORY OF FISHERIES SCIENCE                                         |       |
FW 570 | ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN                |       |
HST 481/HST 581 | **ENVIRONMENTAL HISTORY OF THE UNITED STATES**                     |       |
HST XXX. Global Environmental History (Pending approval) |       |
HSTS 421/HSTS 521 | **TECHNOLOGY AND CHANGE**                                           |       |
HSTS 422/HSTS 522 | **HISTORICAL STUDIES OF SCIENCE AND POLITICS**                      |       |
PHL XXX. Environmental Justice (Pending submission & approval) |       |
PSY 492/PSY 592 | CONSERVATION PSYCHOLOGY                                             |       |
WGSS 523 | COMMUNITY ORGANIZING AND COLLECTIVE ACTION                           |       |
WGSS 540 | WOMEN AND NATURAL RESOURCES                                         |       |
WGSS 550 | ECOFEMINISM                                                          |       |

Environmental Thinking

ANTH 481/ANTH 581 | *NATURAL RESOURCES AND COMMUNITY VALUES                              |       |
ECON 439/ECON 539 | *PUBLIC POLICY ANALYSIS                                              |       |
ENSC 520 | ENVIRONMENTAL ANALYSIS                                               |       |
ES 448/ES 548 | NATIVE AMERICAN PHILOSOPHIES                                         |       |
FES XXX. Conservation Ethics (Pending submission & approval) |       |
FES XXX. Critical Thinking About Environmental Issues (Pending submission & approval) |       |
FW 537 | STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT          |       |
Environmental Arts and Humanities

Graduate Minor

Minor Code: 8201

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select a minimum of four credits from the following:</td>
<td>4</td>
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<tr>
<td>EAH XXX. Environmental Arts and Humanities Methods and Practice</td>
<td></td>
<td></td>
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<tr>
<td>(Pending submission &amp; approval)</td>
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<tr>
<td>EAH 511 PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAH 508 PROFESSIONAL DEVELOPMENT WORKSHOP</td>
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<tr>
<td>Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select a minimum of 8 credits</td>
<td>8</td>
<td></td>
</tr>
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</table>

Social Science Undergraduate Major (BA, BS, HBA, HBS)

Available only at OSU-Cascades.

The Social Science major is only offered at the OSU-Cascades Campus through the Division of Arts and Sciences, College of Liberal Arts at OSU. Students will also be able to take advantage of distance courses offered by OSU Ecampus and streamed via TV from Corvallis.

Completion of the Community Development and Leadership option is required to earn a degree in Social Science.

Major Code: 286

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baccalaureate Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 48 credits</td>
<td>48</td>
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</tr>
<tr>
<td>College of Liberal Arts Requirements 1</td>
<td></td>
<td></td>
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<tr>
<td>Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 5 courses of the following:</td>
<td>2</td>
<td></td>
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<tr>
<td>Humanities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine Arts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Western Culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional course requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-Division Requirements</td>
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<td></td>
</tr>
<tr>
<td>Select one of the following BS or BA options:</td>
<td>18-20</td>
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<tr>
<td>Option 1: Bachelor of Science</td>
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<td></td>
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<tr>
<td>Option 2: Bachelor of Arts</td>
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<td></td>
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<tr>
<td>Social Science Major</td>
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<td></td>
</tr>
<tr>
<td>Social Science Core Required Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 352 *ANTHROPOLOGY, HEALTH, AND ENVIRONMENT</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or SUS 420 SOCIAL DIMENSIONS OF SUSTAINABILITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 321 INTRODUCTION TO COMMUNICATION THEORY</td>
<td>3</td>
<td></td>
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<tr>
<td>SSCI 211 CAREER DEVELOPMENT IN THE SOCIAL SCIENCES</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SSCI 301 *QUALITATIVE RESEARCH METHODS FOR THE SOCIAL SCIENCES</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Social Science Core Class Selection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select six 300-400 level courses in ANTH, COMM, PSY, PS, or SOC, with one course from at least four disciplines:</td>
<td>18-24</td>
<td></td>
</tr>
<tr>
<td>Total credits required for graduation</td>
<td>180</td>
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</tr>
</tbody>
</table>

1 Courses taken to fulfill College of Liberal Arts Requirements cannot be used to fulfill Bacc Core, major cores or option requirements.
These requirements can be fulfilled at Oregon Community Colleges.

* **Baccalaureate Core Course**

^ **Writing Intensive Course (WIC)**

**Note:** Courses taken to fulfill major requirements cannot be used to fulfill the baccalaureate core, College of Liberal Arts, or option requirements. Not all courses are offered every year. Students should consult the annual schedule of classes for a listing of available courses for the academic year.

### For a Bachelor of Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select 8 credits of the following:</td>
<td></td>
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<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td></td>
</tr>
<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
<td></td>
</tr>
<tr>
<td>MTH 113 (Community College Course)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 211</td>
<td>*FOUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td></td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>MTH 243 (Community College Course)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 244 (Community College Course)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td></td>
</tr>
<tr>
<td>One additional 3-credit course from the science departments except Math and ST (no lab required)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>One computer science course</td>
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<td>4</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

**Note** that MTH 113, MTH 243, MTH 244 are non-OSU courses that meet this requirement. These courses can be taken at Oregon community colleges.

* **Baccalaureate Core Course (BCC)**

### For a Bachelor of Arts

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Two years of a foreign language with a grade of C– or better</td>
<td>18</td>
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<td><strong>Total Hours</strong></td>
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**Major Code: 286**

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
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<tr>
<td>ALS 199</td>
<td>SPECIAL TOPICS</td>
<td>3</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>MTH 105</td>
<td>*INTRODUCTION TO CONTEMPORARY MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>PAC. Physical Education Course</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SPAN 111</td>
<td>FIRST YEAR SPANISH</td>
<td>4</td>
</tr>
<tr>
<td>or CS 101</td>
<td>COMPUTERS: APPLICATIONS AND IMPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 210</td>
<td>*COMPARATIVE CULTURES</td>
<td>3</td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>or COMM 218</td>
<td>INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>SPAN 112</td>
<td>FIRST YEAR SPANISH</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 111</td>
<td>COLLEGE ALGEBRA</td>
<td></td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
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</tr>
<tr>
<td>ANTH 251</td>
<td>*LANGUAGE IN THE USA</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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<tr>
<td>GEO 201</td>
<td>*PHYSICAL GEOLOGY</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>13</strong></td>
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<td><strong>Second Year</strong></td>
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<td>Fall</td>
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<tr>
<td>HST 106</td>
<td>*WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD</td>
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<tr>
<td>PG 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
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<tr>
<td>SPAN 211</td>
<td>SECOND YEAR SPANISH</td>
<td>3-4</td>
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<tr>
<td>or SOIL 205</td>
<td>SOIL SCIENCE</td>
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</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>10-11</strong></td>
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<tr>
<td>Winter</td>
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<tr>
<td>BI 102</td>
<td>*ANIMAL BIOLOGY GENES, BEHAVIOR AND EVOLUTION OF LIFE</td>
<td>4</td>
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<td>ENG 253</td>
<td>*SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
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<td>1</td>
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<tr>
<td>Select one of the following:</td>
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<td>SPAN 212</td>
<td>SECOND YEAR SPANISH</td>
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<tr>
<td>Elective</td>
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<tr>
<td>SSCI 211</td>
<td>CAREER DEVELOPMENT IN THE SOCIAL SCIENCES</td>
<td>1</td>
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<tr>
<td><strong>Hours</strong></td>
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<td><strong>14</strong></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
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</tr>
<tr>
<td>ENG 254</td>
<td>*SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT</td>
<td>4</td>
</tr>
<tr>
<td>ENG 360</td>
<td>*NATIVE AMERICAN LITERATURE</td>
<td>4</td>
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<tr>
<td>Select one of the following:</td>
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<tr>
<td>SPAN 213</td>
<td>SECOND YEAR SPANISH</td>
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<tr>
<td>Elective</td>
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<tr>
<td>College of Liberal Arts Core course</td>
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<tr>
<td><strong>Hours</strong></td>
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<td><strong>16</strong></td>
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<td><strong>Third Year</strong></td>
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<tr>
<td>Fall</td>
<td></td>
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</tr>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>BI 101</td>
<td>*ENVIRONMENTAL BIOLOGY, ECOLOGY, CONSERVATION, GLOBAL CHANGE, or SOIL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMM 321</td>
<td>INTRODUCTION TO COMMUNICATION THEORY</td>
<td>3</td>
</tr>
<tr>
<td>PAC. Physical Education Course</td>
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</tr>
<tr>
<td>PSY 381</td>
<td>ABNORMAL PSYCHOLOGY</td>
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<tr>
<td><strong>Hours</strong></td>
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<td><strong>16</strong></td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 325</td>
<td>COMMUNICATING LEADERSHIP</td>
<td>4</td>
</tr>
<tr>
<td>PG 331</td>
<td>*STATE AND LOCAL POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PSY 360</td>
<td>SOCIAL PSYCHOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>SSCI 301</td>
<td>QUALITATIVE RESEARCH METHODS FOR THE SOCIAL SCIENCES</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 311</td>
<td>*PEOPLES OF THE WORLD-NORTH AMERICA</td>
<td>3</td>
</tr>
<tr>
<td>BA 352</td>
<td>MANAGING INDIVIDUAL AND TEAM PERFORMANCE</td>
<td>4</td>
</tr>
<tr>
<td>COMM 326</td>
<td>INTERCULTURAL COMMUNICATION</td>
<td>3</td>
</tr>
<tr>
<td>PAC. Physical Education Course</td>
<td></td>
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</tr>
<tr>
<td>SDC 439</td>
<td>WELFARE AND SOCIAL SERVICES</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td>4</td>
</tr>
<tr>
<td>SDC 430</td>
<td>GENDER AND SOCIETY</td>
<td>4</td>
</tr>
<tr>
<td>Select two Electives</td>
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<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>16</strong></td>
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</tbody>
</table>
### Community Development and Leadership Option

This option is offered within the following major(s):

- Social Science - College of Liberal Arts (p. 585)

Available only at OSU-Cascades.

**Option Code: 279**

Not all courses are offered every year. Students should consult the annual schedule of classes for a listing of available courses for the academic year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>COMM 323</td>
<td>COMMUNITY DIALOGUE</td>
<td>4</td>
</tr>
<tr>
<td>COMM 440</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>GEO 306</td>
<td>*MINERALS, ENERGY, WATER, AND THE ENVIRONMENT</td>
<td>3</td>
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<td>SUS 420</td>
<td>SOCIAL DIMENSIONS OF SUSTAINABILITY</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Required</strong></td>
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<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>175-176</strong></td>
</tr>
</tbody>
</table>

- Baccalaureate Core Course
- Writing Intensive Course (WIC)

### School of Arts and Communication

#### Art

The Art Area of the School of Arts and Communication offers Bachelor of Fine Arts (BFA), Bachelor of Arts (BA), and Bachelor of Science (BS) degrees through extensive course work in fine arts, graphic design, photography, and art history.

The curriculum provides an awareness and understanding of the historical and contemporary significance of art as a unique feature of society. Major programs offer the opportunity for professional artistic development while incorporating subjects that lead to a liberal education. These programs prepare the student for a range of professional opportunities or later graduate study in photography, fine art, and art history, as well as many related fields. As a cultural enrichment for our students, the Art Area sponsors exhibitions, lectures, workshops, and other events related to the visual arts.

Candidates for the BFA degree may select an option in fine arts or photography. Candidates for the BS degree may select the fine arts or photography option. Candidates for the BA degree may select an option in fine arts, art history, or photography. The BFA is a pre-professional degree. The College of Liberal Arts requirements for the BFA differ from other degree programs. Admission into either the Fine Arts or Photography option is selective and competitive. See program requirements for specific details.

The Art History minor combines an introduction to art history with an opportunity to explore advanced topics. The Visual Arts minor is a studio concentration in either fine arts or photography. The Art Area also participates in the New Media Communications minors and Digital Communication Arts major, as well as the Master of Arts in Interdisciplinary Studies (MAIS).

#### Monthly Art Exhibitions

The Art Area of the School of Arts and Communication, based in Fairbanks Hall, features monthly exhibitions by nationally and internationally recognized artists in the Fairbanks Gallery. The school is also the sponsor of the Visiting Artists and Scholars Lecture Series, which has brought in renowned artists including Philip Pearlstein, Ann Hamilton, Marina Abromovic, Bill Viola, and Do Ho Suh. In 1995, the school created the JumpstART (https://liberalarts.oregonstate.edu/sac/sac-academy/precollege-summer-programs/jumpstart/) Precollege Visual and Performing Arts Workshop held each summer for talented high school students in art, music and theater.

#### Music

The Music Area of the School of Arts and Communication offers programs leading to the Bachelor of Arts (BA) or Bachelor of Science (BS) degree, a variety of baccalaureate core courses for students with little or no background in music, and opportunities for qualified students to perform in bands, choirs, and the symphony orchestra. Students wishing a greater curricular choice may wish to combine music study with courses in another school or department in the College of Liberal
Arts for a liberal studies major. The Music Area also offers minors in Music and Popular Music Studies.

The Music Area also teaches graduate courses in music education, literature and history, conducting, performance and special projects. Graduate students may pursue the Master of Arts in Teaching: Music Education (MAT) degree or the Master of Arts in Interdisciplinary Studies (MAIS) degree in a broad range of fields. OSU's graduate programs in music have been approved by Oregon's Teacher Standards and Practices Commission and the National Council for Accreditation of Teacher Education. Programs are available for individuals seeking both the initial and/or continuing license in music at all levels of authorization.

Performance instruction at the intermediate and advanced levels is available with instructor consent. Students should contact the school office for application procedures and fee schedules.

The Music Area proudly presents upwards of 200 musical events of all types throughout the academic year and summer. Choral, instrumental, orchestral ensembles of all sizes and types provide students from across campus the chance to participate in and/or simply enjoy listening to music. Many ensembles and events include the chance to work with and learn from professional musicians and nationally and internationally-recognized music educators.

Scholarships are available for music majors and for outstanding performers. Auditions and interviews take place in February and March each year. Selection is based on musical and academic achievement.

The Sound Design Lab in Community Hall includes state-of-the-art digital recording and editing hardware and software and is open to all OSU students. Work-study students are available to help students learn how to use the facilities.

Career possibilities in music include teaching in the schools, private instruction, performing in orchestras or ensembles, music librarianship, arts management, music business, and recording engineering.

New Media Communications

The New Media Communications (NMC) Area of the School of Arts and Communication offers Bachelor of Fine Arts (BFA), Bachelor of Arts (BA), and Bachelor of Science (BS) degrees in Digital Communication Arts. There is also a minor in New Media Communications. Course work explores the storytelling capacity of contemporary media and technologies. When pursuing an NMC degree students acquire the skills they need to use today's media effectively in sharing knowledge, imagination, and information. Students also learn to anticipate how future changes in the media are likely to influence their lives. In NMC courses, students explore how to make abstract concepts or hidden processes visible, how to anticipate people's reactions to innovation, how to write professionally, how to recognize the influence of media, how to produce creative content in a variety of media formats, and much more. A New Media Communications major prepares students for a lifetime of change and involvement in the digital world.

NMC courses are taught in multiple venues on campus including the Motion-Capture and Gaming labs, both currently located on the fourth floor of Strand Ag Hall.

Each year numerous New Media students participate in internships with on-campus organizations and off campus with local and regional companies. Selected students participate in the National Association of Broadcasters annual convention and other regional and national organizations and events.

Speech Communication

The Communication Area of the School of Arts and Communication offers a major program leading to a Bachelor of Arts (BA) or Bachelor of Science (BS) degree. The degree examines both theoretical and practical aspects of human communication as a liberal art, as a social science, as background for further study, or as pre-professional experience. All students initially pursuing a Speech Communication major with an option in Communication take basic courses in public speaking, argumentation, and interpersonal communication. Further studies focus on areas such as rhetorical and communication theory, methods of criticism and research, and history. Students pursuing an option in Communication enhance the skills inherent in all human interactions, preparing themselves for a range of potential vocational pursuits, avocations, and graduate study. The area also offers a Communication minor.

The Communication Area is located in cottage-esque Shepard Hall on Campus Way. Communication Area students are active in Lambda Pi Eta, the National Communication Association's honor society for four-year colleges and universities. Students from across the university also compete on the nationally-recognized OSU Forensics Team in individual events and debate. Faculty and graduate students participate regularly in national and regional conferences as well as area-sponsored colloquia on campus.

The Communication Area also takes part in the Master of Arts in Interdisciplinary Studies (MAIS), with many master's students pursuing two areas of concentration within the area's graduate curriculum.

Theatre Arts

The Theatre Arts Area offers a Bachelor of Arts (BA) or Bachelor of Science (BS) degree option in theatre within the Speech Communication major. The Theatre Arts option emphasizes a liberal arts approach to theatre history, practice, and production. All students pursuing the degree complete a core of classes designed to introduce them to fundamental elements of the art. The large remaining portion of the option is split between courses in history/theory/literature and those focusing on design/technical/performance matters. Students select specific classes within each disciplinary area to match their interests (performance, design, literature, etc.) while meeting key degree requirements. The result is a theatre education grounded in a liberal arts perspective and emphasizing a basic knowledge of all theatre elements. The area offers a similarly structured minor in Theatre Arts.

The Theatre Arts Area facilities are located in Withycombe Hall. The Main Stage Theatre seats approximately 350 in a modified-proscenium arrangement while the flexible Laboratory Theatre seats around 100. Both spaces function as classrooms as well as performance venues.

The University Theatre (UT) is the producing arm of the Theatre Arts Area. Students from across campus collaborate with UT faculty, staff, and guest artists to create theatre productions throughout the academic year and summer. Students from all colleges and departments across campus are encouraged and welcome to participate.

The Theatre Arts Area also participates in the Master of Arts in Interdisciplinary Studies (MAIS) degree program.
Undergraduate Programs

Majors

- Art (p. 622)
  Options:
  - Art History
  - Photography and Digital Studio
  - Photography and Digital Studio BFA
  - Studio Art
  - Studio Art BFA
- Arts, Media and Technology (p. 626)
- Digital Communication Arts (p. 628)
- Graphic Design (p. 629)
- Music (p. 637)
  Options:
  - Instrumental Performance
  - Music Education
  - Music Production
  - Piano Performance
  - Vocal Performance
- Music Studies (p. 632)
  Options:
  - Instrumental Performance
  - Music Education
  - Piano Performance
  - Piano Performance and Pedagogy
  - Vocal Performance, Pedagogy and Literature
- Speech Communication (p. 641)
  Options:
  - Communication
  - Theatre Arts

Minors

- Art History (p. 621)
- Arts, Media and Technology (p. 626)
- Communication (p. 627)
- Guitar (p. 631)
- Music (p. 632)
- Music Performance (p. 632)
- New Media Communications (p. 639)
- Photography (p. 639)
- Popular Music Studies (p. 640)
- Studio Art (p. 642)
- Theatre Arts (p. 643)

Certificate

- Scientific, Technical, and Professional Communication (p. 641)

Graduate Programs

Minors

- Art (p. 621)
- Music (p. 631)
- Speech Communication (p. 641)

Lee Ann Garrison, Director

105 Fairbanks Hall
Corvallis, Oregon 97331
Phone: 541-737-5090
Email: LeeAnn.Garrison@oregonstate.edu

Julie Green, Art Area Coordinator
106 Fairbanks Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-4747
Email: art@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/school-arts-and-communication/art/

Trischa Goodnow, Communication Area Coordinator
Shepard Hall B3
Oregon State University
Corvallis, OR 97331-8570
Phone: 541-737-2461
Email: speech.comm@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/school-arts-and-communication/speech-communication/

Steve Zielke, Music Area Coordinator
101 Benton Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-4061
Email: music@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/school-arts-and-communication/music/

William Loges, New Media Communications Coordinator
403 Strand Ag Hall
Oregon State University
Corvallis, OR 97331-8570
Phone: 541-737-1492
Email: nmc@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/school-arts-and-communication/new-media-communications/

Elizabeth Helman, Theatre Arts Area Coordinator
161A Withycombe Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-4627
Email: theatre@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/school-arts-and-communication/theatre/

Faculty

Professors Campbell, M. Carlson, Goodnow, Green, Hiratsuka, Jordon, McCabe, Moore, Sayre, Walker, Zielke
Associate Professors Brooke, Brudvig, Bull, Dollar, Iltis, Loges, Peltomaki, Poppino, Porrovecchio, Rossi
Assistant Professors Bradshaw, Chapman, Faltesek, E. Gallagher, Hesse, Root, Silva, Xue
Senior Instructors A. Carlson, Kesterson
Instructors Beauregard, Bushnell, Ferguson, Gamble, Helman, Myers, Sanders, Trail, Wright
Assistant to the Director Chandler
ART 100. ART ORIENTATION. (1 Credit)
Introduction to the study of art and career options in fine arts, graphic design, photography, and art history.

ART 101. *INTRODUCTION TO THE VISUAL ARTS. (3 Credits)
An introductory lecture course using visual materials with emphasis on methods and motivations that generate the visual experience, both past and present. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core

ART 115. 2-D CORE STUDIO. (4 Credits)
Studio course that introduces the visual language, the elements of design, and the principles of organization. Emphasizes skills, concepts, and problem solving in the areas of two-dimensional design and color.
Attributes: LACF – Liberal Arts Fine Arts Core

ART 117. 3-D CORE STUDIO. (4 Credits)
Studio course examining three-dimensional design elements and their spatial organization. Emphasizes innovative problem solving and exposure to varied media. Gives students a sound conceptual basis to apply to more advanced media-oriented courses.

ART 121. DIGITAL CORE STUDIO. (4 Credits)
An introductory studio art class using computers in the visual arts. Project-based exploration of digital imaging, layout, 3-D rendering, and video. Examination of the impact of digital technology on the visual arts from contemporary and historical perspectives.

ART 122. INTRODUCTION TO TIME-BASED ART. (4 Credits)
Introduction to time-based media using the computer as a tool. Studio art class developing skills in video art, sound art, performance, and other time-based digital arts. Exploration of sequential, experimental, historical, and contemporary themes and the role of the audience in time-based art.
Prerequisites: ART 115 with D- or better
Equivalent to: ART 122

ART 131. DRAWING CORE STUDIO. (4 Credits)
Introductory studio course in drawing techniques with emphasis on developing skills in perception and visual organization. Lec/studio.
Attributes: LACF – Liberal Arts Fine Arts Core

ART 199. SPECIAL STUDIES. (0-16 Credits)
Equivalent to: ART 199H
This course is repeatable for 16 credits.

ART 204. *INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES. (3 Credits)
A survey of the painting, sculpture, architecture, and decorative arts of Europe and the Mediterranean between the Paleolithic period and the eleventh century. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ART 205. *INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE. (3 Credits)
A survey of the painting, sculpture, architecture, and decorative arts of Europe between the late Middle Ages and the seventeenth century. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ART 206. *INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY. (3 Credits)
A survey of painting, sculpture and other visual arts in the Western world from the late eighteenth century to the present. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ART 208. *INTRODUCTION TO ASIAN ART. (3 Credits)
Introduces the distinctive, yet related, aesthetic traditions of South and Southeast Asia, Inner Asia, and East Asia. It focuses on architectural sites, sculptures, and paintings from prehistory to the present. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

ART 210. *HISTORY OF WESTERN ARCHITECTURE. (3 Credits)
A survey of buildings and architectural thought in the West from antiquity to the twentieth century; focuses on major periods and movements of architectural history by examining building types, patrons, materials, building traditions, structural innovations and other critical aspects inherent to architecture. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ART 211. WOODTURNING WITH SCIENCE I. (4 Credits)
An introduction to scientific woodturning. Students will get a grounding in tools, lathes, sharpening, and set-up, and then will transition into turning basic forms (spindle and bowl). Particular relevance will be placed upon grain orientation, wood moisture content, wood anatomy, wood chemistry, wood species and extractive effects, and how all of these attributed affect both form and function. Class instruction will be entirely studio based. CROSSLISTED as ART 211/WSE 211.
Equivalent to: WSE 211
This course is repeatable for 8 credits.

ART 215. COLOR IN THE VISUAL ARTS. (4 Credits)
Studio course following ART 115 and ART 117 that examines the properties of colors and their interaction. Emphasizes problem solving and the experimental use of color.
Prerequisites: ART 115 with D- or better

ART 222. INTRODUCTION TO TIME-BASED ART. (4 Credits)
Introduction to time-based media using the computer as a tool. Studio art class developing skills in video art, sound art, performance, and other time-based digital arts. Exploration of sequential, experimental, historical, and contemporary themes and the role of the audience in time-based art.
Prerequisites: ART 121 with C- or better
Equivalent to: ART 122

ART 234. DRAWING II/FIGURE. (4 Credits)
Drawing from the life model with emphasis on skill and conceptual awareness as well as anatomical consideration.
Prerequisites: ART 131 with D- or better

ART 263. DIGITAL PHOTOGRAPHY. (4 Credits)
Introductory course in digital photography. Focus on creation of photographic images in series format. Technical camera operation will be emphasized as well as basic photographic composition, use of photographic editing software, historical grounding, and discussions of contemporary issues in photography. Students must have the use of a digital single lens reflex camera (DSLR) or mirrorless camera (with viewfinder and fully manual controls).
Recommended: ART 115 and ART 120

ART 264. *PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART. (3 Credits)
Introduction to the history of photography through aesthetic, cultural and technical contexts. This course covers the history of photography and its technologies, photography in art, some photographers and their photographs and the purposes of photography. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
ART 271. PRINTMAKING I. (4 Credits)
Introduction to the basic processes of printmaking, with options among relief, lithography, intaglio, screen printing and monotype.
Prerequisites: ART 115 with C- or better and ART 131 [C-]

ART 281. PAINTING I. (4 Credits)
Introductory studio course with emphasis on basic materials and techniques in painting. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: ART 131 with C- or better

ART 291. SCULPTURE I. (4 Credits)
Studio course in basic materials and approaches used in sculpture; a foundation for further three-dimensional work. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: ART 117 with C- or better
Recommended: Art core curriculum

ART 306. ADVISOR REVIEW. (1 Credit)
A review, conducted by the student's advisor and another faculty member of the student's choosing, of work produced to date in the student's area of concentration. Graded P/N.
Prerequisites: Fine Arts Portfolio Review with a score of 1

ART 310. *EARLY CHINESE ART AND ARCHAEOLOGY. (3 Credits)
Introduces major forms of Chinese art from the Neolithic period to the Tang dynasty (618-907 CE) and related major archaeological finds. Stresses the materials and processes of making art, development of representational art, and the role of visual arts in an aristocratic and religious culture. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 311. *LATE CHINESE ART AND CULTURE. (3 Credits)
Introduction to the major forms of Chinese art and visual culture from the eleventh century to the early twentieth century. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 312. *CONTEMPORARY CHINESE ART. (3 Credits)
Introduces origins and development of contemporary Chinese art and visual culture in its domestic and global contexts. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 313. *ART OF JAPAN. (3 Credits)
Surveys the arts of Japan from the prehistoric period to the twentieth century. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 320. *ANCIENT GREEK ART. (3 Credits)
Focuses on the major artistic developments in Ancient Greece from the Middle Bronze Age to 31 BCE, and especially on the city-state of Athens during the Fifth Century. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 321. *ANCIENT ROMAN ART AND ARCHITECTURE. (3 Credits)
Survey of ancient Roman art and culture between the sixth century BCE and fifth century CE, covering principal media, styles, and subject matter. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ART 322. *MEDIEVAL ART AND ARCHITECTURE. (3 Credits)
Survey of the art and architecture of the major periods and cultures of Europe and the Mediterranean between the fourth and the fourteenth century. Traces salient developments in thought and material culture of western civilization. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ART 323. *ITALIAN RENAISSANCE ART AND ARCHITECTURE. (3 Credits)
Survey of Italian Renaissance art and culture, covering the principal artists, patrons, media, styles, and subject matter. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ART 331. DRAWING CONCEPTS. (4 Credits)
Studio course emphasizing drawing composition as an investigative, conceptualizing and communicative nonverbal language. Independent thinking, problem solving, and creative development encouraged.
Prerequisites: ART 131 with C- or better and ART 234 [C-]
This course is repeatable for 12 credits.

ART 334. DRAWING III: FIGURE. (4 Credits)
Intermediate study of the human figure utilizing life models, the skeleton, and anatomy texts. Emphasis on gaining greater knowledge of the body's underlying structure and potential for aesthetic expression.
Prerequisites: ART 234 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 12 credits.
Recommended: Art core curriculum.

ART 339. PROFESSIONAL PRACTICES FOR ARTISTS. (3 Credits)
Examination of relevant issues and realities facing working artists today through class discussion, critical readings, gallery visits, guest lectures and panel discussions. Development of professional practices appropriate for artists and the business of art include portfolio development, writing and presentation skills, grants, contracts, exhibition opportunities and marketing strategies.
This course is repeatable for 6 credits.

ART 340. DARKROOM PHOTOGRAPHY I. (4 Credits)
Studio course in black-and-white film exposure and development, and printing in the darkroom. The medium of silver-based black-and-white photography is explored as a communication mode and art form. Historical, conceptual, technical and legal aspects of traditional wet processing are surveyed. Access to a single lens reflex (SLR) film camera is required. Course fee.
Recommended: ART 263 for Photography majors

ART 341. DARKROOM PHOTOGRAPHY II. (4 Credits)
Improving silver-gelatin printing and photographic presentation techniques. Emphasis on furthering creative visual language and individual photographic project development. Studio and lecture course. Student must supply a medium format or 35mm single lens reflex (SLR) film camera. Lec/studio.
Prerequisites: ART 340 with D- or better

ART 345. INTERMEDIATE PHOTOGRAPHY. (4 Credits)
Emphasis is on both technical and aesthetic expression of digital color photography, from initial image capture, color management to finished print along with color symbolism and composition. Exploration of narrative, sequencing and image-series concepts. Introduction to contemporary color photographers. Studio.
Prerequisites: ART 263 with C+ or better
ART 346. PHOTO ILLUSTRATION I. (3 Credits)
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Review with a score of 1)
Recommended: ART 262 and Art core curriculum

ART 347. PHOTOGRAPH: STUDIO LIGHTING. (4 Credits)
Practical studio class surveying the basic principles and application of light in the creation of photographs. The development of craft and technique inside the studio will be emphasized but formal and conceptual considerations related to light and photography will also be explored.
Prerequisites: ART 263 with C or better
Recommended: ART 345

ART 348. CONCEPTS IN DIGITAL IMAGING. (4 Credits)
Approaches to non-traditional and the manipulated image in digital photography with an emphasis on producing personal imagery. Introduction to the history of the manipulated image in photography and to contemporary approaches to digital photography.
Prerequisites: ART 263 with D or better
Recommended: ART 121 or prior Photoshop knowledge

ART 349. VIDEO ART. (4 Credits)
Studio course in video art and time-based media projects. Emphasis on experimental approaches to video art in a contemporary art context, linear and non-linear video production and the projection and screening of video art projects. Introduction to the history of video art as an art form.
Lec/studio. CROSSLISTED as ART 349/NMC 349.
Prerequisites: ART 222 with C- or better and ART 263 [C]
Equivalent to: NMC 349
This course is repeatable for 8 credits.

ART 350. PHOTOGRAPHY ON ASSIGNMENT. (4 Credits)
An introduction to shooting photographs on assignment. Students will create, edit, caption, and submit photographs for print publications, online media, and alternative/independent media venues. Students will experiment with text, audio slideshows, and other creative means of illustrating concepts and ideas. Also covered are history, law, and ethics of photojournalism.
Recommended: ART 263 or active knowledge of camera operations, shooting RAW files and Adobe Lightroom.

ART 351. INSTALLATION. (4 Credits)
Studio/lecture course designed to acquaint the student with the possibilities of using non-traditional means such as site, time, and interaction to communicate ideas.
Prerequisites: ART 291 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Review with a score of 1)
Recommended: Foundation curriculum

ART 352. *CREATIVE COLLABORATION: DESIGNING AND BUILDING. (3 Credits)
Working in multi-disciplinary teams, design, implement, and document a piece of public art work or science museum display. Projects may be made of any media, but must demonstrate creativity both in the engineering used to create them and the technology and society message they convey. CROSSLISTED as ART 352/ENGR 352. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENGR 352

ART 354. ALTERNATIVE PROCESSES IN PHOTOGRAPHY. (4 Credits)
Historical photographic printing methods in use today e.g., cyanotype, gum bichromate and more. Use of digital and analog negatives, mixing emulsions and coating paper by hand.
Prerequisites: ART 263 with C- or better and ART 345 [C-]
Recommended: ART 340

ART 355. THE PHOTOGRAPHIC BOOK. (4 Credits)
Practical studio course focusing on the photographic book in all of its forms. Use appropriated imagery as well as original imagery to create a variety of zines as well as soft and hardcover photo-books. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. CROSSLISTED as ART 355/ GD 355.
Prerequisites: ART 263 with C- or better
Equivalent to: GD 355

ART 359. *PHOTOGRAPH: ACTIVISM, AND SOCIAL CHANGE. (3 Credits)
Explores photography as an agent of social change through creative projects and topical discussions. Emphasis on the visual language, ethical considerations, and strategies employed by activist photographers that disrupt dominant ideologies and address institutionalized inequality and privilege in the United States. No prior photography experience necessary. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

ART 364. *NINETEENTH-CENTURY ART. (3 Credits)
Lecture course covering the principal movements and trends in late eighteenth-century and nineteenth-century architecture, painting, and sculpture in Europe and America, from Neoclassicism to Symbolism. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 365. *HISTORY OF MODERN ART 1900-1945. (3 Credits)
Lecture course covering the principal movements and trends in early twentieth-century Western art, from Expressionism to early American Modernism. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 366. ART SINCE 1945. (3 Credits)
Lecture course covering the principal movements, theories and ideas in visual art since 1945, including painting, sculpture, photography, installation, performance and participatory art.
Recommended: ART 204 and ART 205 and ART 206

ART 367. *HISTORY OF DESIGN. (3 Credits)
A survey of the impact of technology on the visual qualities of graphic, advertising, fashion, architecture, and industrial design from the Victorian Arts and Crafts Movement to the computer age. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ART 368. *HISTORY OF PHOTOGRAPHY. (3 Credits)
The development of photographic processes and applications. Influential figures. From the early beginnings to contemporary trends. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ART 375. PRINTMAKING: RELIEF. (4 Credits)
Studio course in relief printmaking with emphasis on linocut and woodcut; may include other relief processes, i.e. photo polymer plate. Black-and-white and color.
Prerequisites: ART 101 with C- or better and ART 115 [C] and ART 131 [C] and ART 271 [C]
ART 376. PRINTMAKING: INTAGLIO. (4 Credits)
Studio course in intaglio printmaking with emphasis on drypoint, line etching, aquatint, softground and photo process. Black-and-white and possibly color for final project.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 377. PRINTMAKING: LITHOGRAPHY. (4 Credits)
Studio course in lithographic printmaking with emphasis on graining the stone, drawing with crayon and tusche, etching and reworking, inking and printing lithographic limestone. Black-and-white and possibly color for final project.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 378. PRINTMAKING: MONOTYPE. (4 Credits)
Studio course in monotype printmaking with emphasis on drawing/inking with a lithographic roller and printing with an etching press. Black-and-white and color.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 379. PRINTMAKING: SCREEN PRINTING. (4 Credits)
Studio course in screen printing with emphasis on paper stencil, drawing fluid and photo emulsion processes. Students are exposed to a range of techniques and concepts are encouraged to investigate personal motivations while making multiple color prints.
Prerequisites: ART 115 with C- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
Recommended: Art core curriculum. ART 100, ART 101, ART 117, ART 131, ART 204, ART 205, ART 206.

ART 381. PAINTING II: THE FIGURE. (4 Credits)
Studio course with emphasis on painting from the live model; understanding the figure in terms of color, form and composition, the figure as symbol, implied narrative and vehicle of expression.
Prerequisites: ART 281 with C- or better and ART 234 [C-]
This course is repeatable for 8 credits.
Recommended: ART 234 and Art core curriculum.

ART 382. PAINTING II: CONCEPTS. (4 Credits)
Painting with emphasis on experimentation and an exploratory investigation of mixed media, new media, collage, and assemblage, utilizing either representation or abstraction.
Prerequisites: ART 281 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 8 credits.
Recommended: Art core curriculum.

ART 383. PAINTING II: ABSTRACT AND MULTIMEDIA. (4 Credits)
Intermediate studio course with emphasis on contemporary directions in painting: abstraction and non-literal approaches.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 281 [C-]
This course is repeatable for 12 credits.
Recommended: Art core curriculum.

ART 384. PAINTING II: NEW GENRE. (4 Credits)
Exploration of current directions in painting using traditional and non-traditional concepts and techniques.
Prerequisites: ART 281 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 12 credits.

ART 385. PAINTING II: ENCAUSTICS. (4 Credits)
Exploration and application of a variety of traditional and non-traditional techniques using encaustics paint; beeswax and pigment fused to a surface.
Prerequisites: ART 281 with C- or better
This course is repeatable for 8 credits.

ART 386. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART I. (4 Credits)
The first course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Conquest to Civil War. CROSSLISTED as ART 386/ENG 386.
Equivalent to: ENG 386

ART 387. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART II. (4 Credits)
The second course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Civil War to Harlem Renaissance. CROSSLISTED as ART 387/ENG 387.
Equivalent to: ENG 387

ART 388. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART III. (4 Credits)
The third course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Great Depression to Postmodernity. CROSSLISTED as ART 388/ENG 388.
Equivalent to: ENG 388

ART 391. SCULPTURE II. (4 Credits)
Intermediate studio course with emphasis in material research and developing greater skills and technical knowledge in sculptural fabrication processes.
Prerequisites: ART 291 with C- or better
This course is repeatable for 12 credits.
Recommended: Art core curriculum.

ART 395. SPECIAL TOPICS IN EARLY ART HISTORY. (3 Credits)
Intermediate studio course in painting with aqueous materials. Emphasis on media and composition. PREREQ: Core curriculum; ART 295.
This course is repeatable for 99 credits.

ART 396. SELECTED TOPICS IN MODERN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 397. SELECTED TOPICS IN GLOBAL ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 398. SPECIAL TOPICS IN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

ART 399H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

ART 400. THE DISCERNING PEN: ART CRITICISM. (3 Credits)
Writing on art history provides students with an opportunity to write about art using three distinct structures and styles while drawing on the student’s own ideas and opinions.
Prerequisites: (ART 101 with D- or better or WR 121 with C- or better) and ART 200 [D-] and ART 206 [D-]

ART 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
ART 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ART 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ART 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ART 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ART 407. SEMINAR. (1-16 Credits)
Equivalent to: ART 407H
This course is repeatable for 16 credits.
Recommended: ART 206

ART 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 409. PRACTICUM STUDENT MEDIA. (1 Credit)
Practical workshop class offering experiential learning in student media on the Oregon State University campus.
Equivalent to: NMC 409
This course is repeatable for 12 credits.

ART 410. INTERNSHIP. (1-16 Credits)
A one-quarter residency with an appropriate, approved agency or organization where a student may receive practical experience related to the objectives of the Department of Art. The intern observes and produces; the work is supervised and evaluated, both by the agency and the art faculty.
This course is repeatable for 16 credits.

ART 411. *ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES. (3 Credits)
Seminar developing writing and research skills in the field of art with interdisciplinary approaches. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: Fine Arts Portfolio Review with a score of 1
Recommended: Art core curriculum plus 12 credits of upper-division studio credits.

ART 413. WOODTURNING WITH SCIENCE II. (4 Credits)
An in-depth look at how character in wood (figure, spalting, knots, etc.) affects machinability and output in both functional and aesthetic turning. Students will work with a wide range of spalted wood types and figure across numerous species while working on advanced turning forms. Particular emphasis will be placed upon how figure affects grain orientation, how spalting affects density and stability, and how the challenges with character wood can be overcome without specialty tools. Class instruction will be entirely studio based. CROSSLISTED as ART 413/WSE 413.
Prerequisites: WSE 210 with C- or better and WSE 211 [C-]
Equivalent to: WSE 413
This course is repeatable for 8 credits.

ART 414. ARTS MANAGEMENT. (3 Credits)
Survey of the theory and practice of managing an arts organization in an increasingly digital world. Includes managing diverse teams, interpersonal communication, cultural competence, and best practices in leadership, organizational planning, and conflict management.

ART 415. ART FOR TEACHERS I. (4 Credits)
A studio course covering basic art materials and techniques. Integrates aesthetics and art criticism, creating art, and the cultural and historical context of works of art for K-12. May be taken in any order.
Recommended: Fine Arts Portfolio Review (ART1) and Graphic Design Portfolio Review (ART2)

ART 416. ART FOR TEACHERS II. (4 Credits)
A studio course covering basic art materials and techniques. Integrates aesthetics and art criticism, creating art, and the cultural and historical context of works of art for K-12. May be taken in any order.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)

ART 418. PORTFOLIO SEMINAR. (2 Credits)
An advanced lecture course providing an overview of pertinent issues in creating a professional graphic design portfolio. Graded P/N.
Prerequisites: Graphic Design Portfolio Revie with a score of 1

ART 422. NEW MEDIA: INTERACTIVE. (4 Credits)
An advanced course designing digital experiences with emphasis on innovative navigation, architectural structures, theoretical, and historical issues of new media.
Prerequisites: Graphic Design Portfolio Revie with a score of 1
Recommended: CS 295

ART 431. DRAWING IV. (3-5 Credits)
Development of an individual approach to the varied aspects of drawing, emphasis on exploration of traditional and contemporary techniques and styles. Course offered 3 to 5 credits per term.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 15 credits.
Recommended: 9 credits of ART 331.

ART 432. *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/ QS 532/WGSS 532. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 432, WGSS 432

ART 434. DRAWING IV/FIGURE. (3-5 Credits)
Development of an individual approach to the varied aspect of figure drawing; emphasis on exploration of traditional and contemporary techniques and styles. Course offered 3-5 credits per term; maximum 15 credits. Departmental approval required for 5 credits.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 15 credits.
Recommended: 9 credits of ART 334.

ART 441. PHOTOGRAPHY III. (4 Credits)
Prerequisites: ART 341 with D- or better
This course is repeatable for 12 credits.
ART 443. COMBINED MEDIA: PHOTO INSTALLATION. (4 Credits)
This studio course explores the use of the photographic image in
conjunction with other studio media to create multi-media works and site-
specific installations. Designed to remove and release the photographic
image from its ubiquitous tradition, it looks to reassess the association
of photography as a merely a two dimensional pursuit. Emphasizing the
relationship between objects, the course investigates installation art
as a contemporary practice and focuses on the role photography or
the photographic image has played in expanding this dialogue. Issues
involved with using photography for the purposes of creating multimedia
spatial experiences are discussed and compared with ideas related to
traditional photographic presentation.
Prerequisites: ART 345 with C or better
This course is repeatable for 8 credits.
Recommended: Understanding of basic camera functions and
competency using digital printing techniques

ART 444. THE CONSTRUCTED IMAGE. (4 Credits)
An advanced studio photography course that explores directed,
manipulated, and constructed photographs. It investigates this rich
tradition by looking at both historical and contemporary photography.
Issues involved with making clearly artificial photographs are
discussed and compared with traditional ideas related to veracity of the
photographic image.
Prerequisites: ART 345 with C or better
Recommended: Pre-established foundation of technical camera
operations and digital printing skills

ART 446. DOCUMENTARY PHOTOGRAPHY. (4 Credits)
Intensive in-depth documentary photography course designed to
develop skill in telling stories with pictures. The course requires
pitching a photographic project, reading and writing about documentary
photography, and producing a sustained photographic essay with a self-
selected documentary subject. Expanded documentary mediums and
socially concerned photography are also covered. Hybrid Course.
Prerequisites: ART 263 with C or better and ART 345 [C]
This course is repeatable for 12 credits.

ART 447. ADVANCED STUDIO LIGHTING. (4 Credits)
Practical studio course focusing on the advanced applications of studio
and location lighting. Students will use digital cameras in combination
with professional strobe and mixed artificial lighting. Real-world location
lighting challenges will be mastered: scouting locations, hauling and
setting up gear, working with models and products, and learning to work
on-location.
Prerequisites: ART 263 with C or better and ART 347 [C]
This course is repeatable for 8 credits.

ART 451. INTRODUCTION TO ARTS ENTREPRENEURSHIP. (3 Credits)
Survey of the business strategies behind a successful career in the
arts. Emphasizes the importance of entrepreneurial thinking, engages
students with the fundamentals of the arts 'business', and explores ways
to influence and shape the industry's future. CROSSLISTED as ART 451/
MUS 451/TA 451. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 451, TA 451

ART 454. ALTERNATIVE PROCESSES IN PHOTOGRAPHY II. (4 Credits)
Advanced projects using historical photographic processes.
Prerequisites: ART 354 with C or better
This course is repeatable for 8 credits.

ART 455. THE PHOTOGRAPHIC BOOK II. (4 Credits)
Practical studio course focusing on advanced practices and techniques
in relation to the photographic book. Use appropriated imagery as
well as original imagery to complete well-developed book projects.
Structure, form, materials, and layout will be discussed as well as content,
sequencing, and physical construction. Advanced elements such as
application of blanking, slip cases, screen printing, and other construction
techniques will be taught. CROSSLISTED as ART 455/GD 455.
Prerequisites: ART 355 with C- or better
Equivalent to: GD 455

ART 456. PORTFOLIO-PHOTOGRAPHY/VIDEO ART. (4 Credits)
Culmination-level course for the creation of an exhibition-level
photographic portfolio or other artistic product using lens-based media.
Taught using lectures, critiques, readings, writing and self-reflection.
Prerequisites: ART 340 with C- or better and ART 345 [C-] and ART 347 [C-]
This course is repeatable for 12 credits.

ART 460. HISTORY OF AMERICAN ART. (3 Credits)
Specialized study of the visual arts in the United States focusing on such
issues as landscape, mass culture, and American responses to European
culture. Art and ideas from the colonial period to 1900. Not offered every
year.
Recommended: 9 credits of art history and American literature or
American history.

ART 461. HISTORY OF AMERICAN ART. (3 Credits)
Specialized study of the visual arts in the United States focusing on such
issues as landscape, mass culture, and American responses to European
culture. American modernism since 1900. Not offered every year.
Recommended: 9 credits of art history and American literature or
American history.

ART 462. DIRECTIONS AND ISSUES IN CONTEMPORARY ART. (3 Credits)
Specialized study of current trends, developments, and critical issues,
including the study of new media such as video and photography, as they
manifest themselves in the contemporary art world. May be repeated with
different topics. Not offered every year.
This course is repeatable for 9 credits.
Recommended: 9 credits of art history

ART 463. TOPICS IN RENAISSANCE AND BAROQUE ART. (3 Credits)
Specialized study of selected areas of special interest, including such
topics as Michelangelo, Leonardo da Vinci, Bernini, and art in the Medici's
Florence. Subject matter may vary year to year. Not offered every year.
This course is repeatable for 6 credits.
Recommended: 9 credits of art history

ART 464. CULTURAL STUDIES OF THE MUSEUM. (3 Credits)
Overview of the history, visual culture, and cultural significance of the
Western museum. Special attention paid to the development of the art
museum and artist's projects that pertain to museums.
Recommended: 9 credits of art history

ART 466. HISTORY OF PRINTMAKING. (3 Credits)
Survey of the social, economic, intellectual, and technical history of
printmaking between the early Middle Ages and the twentieth century in
Asia, Europe, and the Americas. Treats the major printmaking processes
of woodcut, intaglio, lithography, silkscreen, and photography.

ART 469. METHODS AND THEORY OF ART HISTORY. (3 Credits)
Seminar designed to improve writing and library skills, develop
interdisciplinary approaches, and explore art historical theory from Plato
to the present.
Attributes: CWIC – Core, Skills, WIC
Recommended: 9 credits of art history
ART 475. PRINTMAKING STUDIO. (4 Credits)
Studio workshop in relief, intaglio, lithographic, and silkscreen media on
an individual project basis. Course offered 4 credits per term; maximum
20 credits.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-]
and ART 271 [C-]
This course is repeatable for 20 credits.
Recommended: 8 credits of 300-level printmaking.

ART 479. PRINTMAKING: ADVANCED SCREEN PRINTING. (4 Credits)
Studio course in screen printing with an emphasis on photo emulsion
processes. Students are encouraged to integrate these processes with
other art-making methods in their creative work.
Prerequisites: ART 379 with D- or better and (Fine Arts Portfolio Review
with a score of 1 or Graphic Design Portfolio Review with a score of 1)
This course is repeatable for 12 credits.

ART 481. PAINTING III. (4 Credits)
Development of individual interests and directions in painting. Maximum
16 credits.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-]
and ART 281 [C-]
This course is repeatable for 16 credits.
Recommended: 12 credits of any combination of the following: ART 381,
ART 382, ART 383, ART 384, ART 385.

ART 491. SCULPTURE III. (4 Credits)
Development of individual interests and directions in sculpture.
Prerequisites: ART 391 with C- or better
This course is repeatable for 24 credits.
Recommended: 12 credits of 300-level sculpture

ART 492. SPECIAL TOPICS IN ASIAN ART. (3 Credits)
Specialized study of selected areas of Asian art history such as Chinese
calligraphy, Song Dynasty painting, and storytelling in Asian art. May be
repeated with different topics.
This course is repeatable for 99 credits.

ART 494. SPECIAL TOPICS IN EARLY ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 495. EXHIBITION DESIGN. (1 Credit)
Participatory experience in art gallery exhibition design working in
Fairbanks Gallery. Includes specialized study in visual design, lighting,
and technical installation. Course offered 1 credit per term, maximum 3
credits.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic
Design Portfolio Review with a score of 1)
This course is repeatable for 3 credits.

ART 496. SELECTED TOPICS IN MODERN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 497. SELECTED TOPICS IN GLOBAL ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 498. SPECIAL TOPICS IN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

ART 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ART 503. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

ART 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ART 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ART 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: ART 206

ART 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 510. INTERNSHIP. (1-12 Credits)
A one-quarter residency with an appropriate, approved agency or
organization where a student may receive practical experience related
to the objectives of the Department of Art. The intern observes and
produces; the work is supervised and evaluated, both by the agency and
the art faculty.
This course is repeatable for 15 credits.

ART 514. ARTS MANAGEMENT. (3 Credits)
Survey of the theory and practice of managing an arts organization
in an increasingly digital world. Includes managing diverse teams,
interpersonal communication, cultural competence, and best practices in
leadership, organizational planning, and conflict management.

ART 515. ART FOR TEACHERS I. (4 Credits)
A studio course covering basic art materials and techniques. Integrates
aesthetics and art criticism, creating art, and the cultural and historical
context of works of art for K-12. May be taken in any order.

ART 516. ART FOR TEACHERS II. (4 Credits)
A studio course covering basic art materials and techniques. Integrates
aesthetics and art criticism, creating art, and the cultural and historical
context of works of art for K-12. May be taken in any order.

ART 532. GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3
Credits)
A creative and discussion-based course focusing on ways in which
photography can and has addressed issues of gender and sexuality. An
introduction to key concepts and intersections in Women’s, Gender and
Sexuality Studies; Queer Studies and photography theory. Create written
introduction to key concepts and intersections in Women’s, Gender and
Sexuality Studies; Queer Studies and photography theory. Create written
and photographic responses to artworks, texts, personal experience and
pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/
QS 532/WGSS 532.
Equivalent to: QS 532, WGSS 532

ART 546. DOCUMENTARY PHOTOGRAPHY. (3 Credits)
An intensive shooting course in 35mm photography designed to develop
skill in telling stories using pictures. Single picture and multiple picture
stories. Lec/lab.
This course is repeatable for 9 credits.
Recommended: ART 350

ART 556. PORTFOLIO-PHOTOGRAPHY/VIDEO ART. (4 Credits)
Culmination-level course for the creation of an exhibition-level
photographic portfolio or other artistic product using lens-based media.
Taught using lectures, critiques, readings, writing and self-reflection.
This course is repeatable for 12 credits.

ART 562. DIRECTIONS AND ISSUES IN CONTEMPORARY ART. (3 Credits)
Specialized study of current trends, developments, and critical issues,
including the study of new media such as video and photography, as they
manifest themselves in the contemporary art world. Not offered every
year. May be repeated with different topics.
This course is repeatable for 9 credits.
Recommended: 9 credits of art history
ART 564. CULTURAL STUDIES OF THE MUSEUM. (3 Credits)
Overview of the history, visual culture, and cultural significance of the Western museum. Special attention paid to the development of the art museum and artist's projects that pertain to museums.
Recommended: 9 credits of art history

ART 569. METHODS AND THEORY OF ART HISTORY. (3 Credits)
Seminar designed to improve writing and library skills, develop interdisciplinary approaches, and explore art historical theory from Plato to the present.
Recommended: 9 credits of art history

ART 581. PAINTING III. (3-5 Credits)
Development of individual interests and directions in painting. Course offered 3 to 5 credits per term; maximum 15 credits.
This course is repeatable for 15 credits.
Recommended: 9 credits of 300-level painting

ART 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

Communication
COMM 111. *PUBLIC SPEAKING. (3 Credits)
Public communication as it relates to informative and persuasive discourse. The theory and practice of public speaking in informative and persuasive contexts. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech
Equivalent to: COMM 111H

COMM 111H. *PUBLIC SPEAKING. (3 Credits)
Public communication as it relates to informative and persuasive discourse. The theory and practice of public speaking in informative and persuasive contexts. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech; HNRS – Honors Course
Designator
Equivalent to: COMM 111

COMM 114. *ARGUMENT AND CRITICAL DISCOURSE. (3 Credits)
Examination of argumentation as a part of human interaction and investigation. The course emphasizes the processes by which people give reasons to gain adherence and to justify beliefs and actions. The course includes readings, writing, and presentations concerned with the nature of arguments, processes of arguing, and argument criticism. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech
Equivalent to: COMM 114H

COMM 114H. *ARGUMENT AND CRITICAL DISCOURSE. (3 Credits)
Examination of argumentation as a part of human interaction and investigation. The course emphasizes the processes by which people give reasons to gain adherence and to justify beliefs and actions. The course includes readings, writing, and presentations concerned with the nature of arguments, processes of arguing, and argument criticism. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech; HNRS – Honors Course
Designator
Equivalent to: COMM 114

COMM 180. INTRODUCTION TO THE RHETORIC OF THE FILM. (3 Credits)
The motion picture from prephotographic eras to the present; individuals responsible for major advances in theory and technique. The motion picture and social influence. Films viewed for discussion and analysis. Film fee required.

COMM 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 211. *COMMUNICATING ONLINE. (3 Credits)
In our increasingly technological world, we use mediated communication to build relationships. Introduces students to the theoretical and practical dimensions on online communication in order to facilitate more informed analysis and performance of online communication as a means of developing both interpersonal and public relationships. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech

COMM 218. *INTERPERSONAL COMMUNICATION. (3 Credits)
Introduction to dyadic and relational communication. Overview of current research in such areas as verbal and nonverbal messages, self-concept and perception, culture and gender stereotypes and styles, relational development and dissolution, deception, compliance gaining and conflict management. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech
Equivalent to: COMM 218H

COMM 221. FORENSICS. (3 Credits)
Laboratory experience in debate, public speaking, and interpretation of literature. Preparation for intercollegiate debate and forensics participation.

COMM 280. MEDIA COMMUNICATION IN THE INFORMATION AGE. (3 Credits)
A survey of the traditional media of mass communication and the new and emerging media technologies: their development, role in contemporary society and impact upon the public. The influence of mediated communication upon living in the information society. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 312. ADVANCED PUBLIC SPEAKING. (3 Credits)
Advanced theory and practice in public speaking. Simulated public speaking situations, audience analysis, and rhetorical strategies will be emphasized. Students will prepare and present a variety of public speeches.
Prerequisites: COMM 111 with D- or better or COMM 111H with D- or better or COMM 114 with D- or better or COMM 114H with D- or better

COMM 314. ARGUMENTATION. (3 Credits)
Concepts and processes of argumentation, systems of logic, critical analysis of contemporary efforts to influence. Examination of arguing to gain adherence and argumentation as a way of knowing. Development of cases and argument briefs for presentation. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 114 with D- or better or COMM 114H with D- or better

COMM 316. ADVANCED PERSUASION. (3 Credits)
Advanced theory and practice in persuasion, with evidence on social and behavioral science research. Examination of the cognitive and affective aspects of persuasion, focusing particularly on the audience. Consideration of persuasion in interpersonal relations, organizations, public advocacy, and public relations. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: COMM 111

COMM 318. ADVANCED INTERPERSONAL COMMUNICATION. (3 Credits)
Advanced theory and practice in communication in interpersonal relations. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: COMM 218 with D- or better or COMM 218H with D- or better
COMM 320. INTRODUCTION TO RHETORICAL THEORY. (3 Credits)
Introduction to the basic theories of rhetoric, as well as the background of rhetoric as a discipline in speech communication. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 321. INTRODUCTION TO COMMUNICATION THEORY. (3 Credits)
Introduction to 20th century models, theories, and empirical research programs in communication. Survey of selected theories and social scientific methods across diverse contexts in communication. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 322. SMALL-GROUP PROBLEM SOLVING. (3 Credits)
Theory and practice of small-group decision making. Group processes of problem solving and decision by consensus. The history and role of group problem solving in a democratic society. Group power, leadership, and roles. Experience with problems of fact, value, and policy. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 323. COMMUNITY DIALOGUE. (4 Credits)
Examination of the nature and role of community dialogue in formal and informal social scenes in which participants communicate differing perspectives, values and beliefs. Taught at OSU-Cascades only.

COMM 324. COMMUNICATION IN ORGANIZATIONS. (3 Credits)
Examination of the nature and role of communication in formal and informal organizations. Introductory survey of central issues in the study of organizations, including corporate communication, leadership, organizational effectiveness, power, organizational culture, management styles, organizational conflict, and decision making. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 325. COMMUNICATING LEADERSHIP. (4 Credits)
Theory and practice of communicating leadership. Communication processes of facilitating productive climates, innovative and creative leading, and goal-oriented community leading. Offered at OSU-Cascades only.

COMM 326. INTERCULTURAL COMMUNICATION. (3 Credits)
Perspectives, theories, and experiences of communication in intercultural, cross-cultural, and pan-cultural relations. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 328. NONVERBAL COMMUNICATION. (3 Credits)
The study of human communication behavior that transcends the spoken and written word; nondiscursive symbolism. The course examines the relationship between nonverbal and verbal communication behavior and nonverbal communication skill development. Topics addressed include space, distance, the environment, touch, gesture, facial expression, and gaze as communication. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 332. FAMILY COMMUNICATION. (3 Credits)
How various elements of communication impact familial relationships. Two main discussions: general communication patterns in the family, and various understudied types of family relationships. Provides students with insights into past familial experiences and skills for future family relationships.
Prerequisites: COMM 218 with D or better

COMM 350. DEBATE AND FORENSICS WORKSHOP. (1-3 Credits)
Laboratory experience in debate, public speaking, and interpretation of literature. Preparation for intercollegiate debate and forensics participation.
This course is repeatable for 15 credits.

COMM 368. PROPAGANDA AND SOCIAL CONTROL. (3 Credits)
Case studies, examples, and analyses of direct and indirect influences upon thought, belief, and action involving mass media of communication, including film, theatre, radio, television, posters, and art objects. Historical approach using film, tape, and recordings for student analysis and discussion. (SS)
Attributes: LACH – Liberal Arts Humanities Core

COMM 372. VISUAL RHETORIC. (3 Credits)
The course will survey the major theories of semiotics. Using semiotics as a foundation, students will explore the nature of the rhetoric of the visual image. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 380. IMAGE AND MYTH IN FILM. (3 Credits)
Film as a medium for creating, reflecting, and defining values, roles, styles, conflicts, problems, strategies, expectations, and institutions in American life. Various methods of analysis and evaluation are applied to film as an agent and artifact. Film images of the frontier, war, women, men, justice, America, progress, and beauty are explored. Film fee required. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 382. TELEMEDIA DESIGN AND PRODUCTION. (4 Credits)
Study and practice of communication through telemedia (video, audio, computer), and emphasis on the principles of telemedia authorship. The study includes telemedia distribution systems and effects on audiences. Lec/lab.

COMM 385. COMMUNICATION AND CULTURE IN CYBERSPACE. (3 Credits)
Covers history and culture of the Internet, as well as social, political, and economic issues of computer-mediated communication. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 388. SOCIAL MEDIA AND INTERPERSONAL RELATIONSHIPS. (3 Credits)
Examines how individuals build and maintain close relationships through new media and social networks. Currently, scholars are seeing a shift in how individuals self-report building close relationships, as people use elements of new media more and more frequently. Designed to look into the similarities and differences of these relationships as compared to face-to-face relationships. CROSSLISTED as COMM 388/NMC 388.
Equivalent to: NMC 388

COMM 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
COMM 410. COMMUNICATION INTERNSHIP. (1-16 Credits)
An assignment in a private or public business or agency. The student observes or works in one or more departments of the enterprise, perhaps in one area of interest or specialization (e.g., public relations, training, personnel, research and planning). Work is supervised by the agency staff, supervising school faculty members(s) provide academic evaluation. 12 credits maximum.
This course is repeatable for 12 credits.
Recommended: Minimum of 21 credits

COMM 412. TOPICS IN SPEECH COMMUNICATION. (3 Credits)
Contemporary issues in speech communication: appraisal and discussion of current theories, trends, research methods, problems, or applications.
This course is repeatable for 9 credits.
Recommended: 9 credits of speech communication.

COMM 414. COMMUNICATION RESEARCH METHODS. (3 Credits)
Communication research and its relationship to theory. Quantitative and qualitative methods of investigation in speech communication. Experimental and non-experimental research design; naturalistic observation; issues of reliability and validity; statistical analysis. Standards and principles of writing and reporting research.
Prerequisites: COMM 321 with D- or better

COMM 416. ETHNOGRAPHY OF COMMUNICATION. (3 Credits)
Study and practice of using ethnography of communication as a research method for developing theory in communication studies; topics include data collection, analysis, and writing ethnographic reports. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: COMM 321 with D- or better

COMM 418. INTERPERSONAL COMMUNICATION THEORY AND RESEARCH. (3 Credits)
Current theory, research, and practice in interpersonal communication. Issues addressed may include compliance gaining, nonverbal behavior, family communication, gender issues, impression formation, rules, and human relations. (SS) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACS – Liberal Arts Social Core
Prerequisites: COMM 321 with D- or better

COMM 422. SMALL-GROUP COMMUNICATION THEORY AND RESEARCH. (3 Credits)
Current theory, research, and practice in small-group communication. Issues addressed may include leadership, decision making, problem solving, training, and human relations. (SS) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACS – Liberal Arts Social Core
Prerequisites: COMM 321 with D- or better

COMM 425. COMMUNICATION AND YOUTH OUTREACH. (4 Credits)
Examines the role of communication outreach when working with youth. Study and examination of applied youth communication theory and research. Topics may include establishing communication boundaries, communicating identity, anti-smoking and anti-drug campaigns, social exclusion, effects of media, and pro-social communication. Students are required to volunteer in a youth context coordinated by the instructor. Taught only on the OSU-Cascades Campus.

COMM 426. INTERCULTURAL COMMUNICATION: THEORIES AND ISSUES. (3 Credits)
Advanced study in intercultural communication theoretical developments and research directions. Topics addressed may include intercultural research methods, training, language and culture, acculturation, and intercultural effectiveness. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: COMM 321 with D- or better and COMM 326 [D-]

COMM 427. CULTURAL CODES IN COMMUNICATION. (3 Credits)
Study and examination of the contextualized use of communication within speech communities and cultures; topics include the cultural patterning of communication and cultural communication theory.

COMM 430. THEORETICAL ISSUES IN COMMUNICATION INQUIRY. (3 Credits)
Review of conceptual, philosophical, ontological, epistemological, and methodological issues in the development of theories in human communication; application to contemporary, empirical human communication research. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: COMM 321 with D- or better

COMM 432. GENDER AND COMMUNICATION. (3 Credits)
Investigation of impact of sex and gender on communication in conflict, decision-making, leadership, nonverbal messages, language, and interpersonal relationships. Focus on definitions of sex and gender in regard to knowledge, social constructs, and self-development.
Prerequisites: COMM 321 with D- or better
Equivalent to: COMM 432H

COMM 435. SCIENTIFIC, TECHNICAL, & PROFESSIONAL COMMUNICATION CAPSTONE. (1 Credit)
Complete a portfolio comprised of material generated throughout previous courses in the Certificate in Scientific, Technical, and Professional Communication. CROSSLISTED as COMM 435/WR 435.
Equivalent to: WR 435
Recommended: Completion of 18 credits towards the Scientific, Technical and Professional Communication Certificate

COMM 437. HEALTH COMMUNICATION. (3 Credits)
This class is designed to unpack various elements of how communication impacts health, and vice versa. There are three main sections to this course: 1) discussing doctor-patient communication, 2) discussing the effects of health campaigns, and 3) discussing the link between communication and both psychological and physiological health.

COMM 440. THEORIES OF CONFLICT AND CONFLICT MANAGEMENT. (3 Credits)
Conflict on a variety of levels: intrapersonal, interpersonal, group, public, and social. Conflict in a variety of contexts: relationships, family, organizations, community, and society. Constructive and destructive means of confronting and managing conflict; social and psychological aspects of conflict; conflict analysis; causes of conflict; conflict and peace, social order, and social change; case studies of conflict. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 321

COMM 442. BARGAINING AND NEGOTIATION PROCESSES. (3 Credits)
Theory and practice of bargaining and negotiation as means of settling disputes, with emphasis on the role of communication. Strategies and tactics of distributive and integrative bargaining orientations. Negotiation preparation and experience through case studies and simulations. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 321
COMM 444. THIRD PARTIES IN DISPUTE RESOLUTION: MEDIATION AND ARBITRATION. (3 Credits)
Philosophies, strategies, practices, and characteristics of mediation and arbitration processes in the settlement of conflicts and disputes. Study of the role of the third party neutral in the peace making process. Case studies and simulations in mediation and arbitration. (SS) (Bacc Core Course)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: COMM 321

COMM 446. *COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES. (3 Credits)
Examination of the nature of international conflicts and disputes and the roles culture and communication play in resolving them constructively. Analysis of negotiation, mediation, and international law as approaches to dealing with international political, economic, cultural, and religious disputes. Scrutiny of contemporary world conflicts. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Recommended: COMM 321

COMM 454. ADVANCED ARGUMENTATION. (3 Credits)
Advanced study in classical and current theories of the persuasive and epistemological functions of argumentation. Examination of the dominant contemporary theorists, including Toulmin, Perelman, and Willard. Analysis of research and applied perspectives, including conversational argument, argument fields, the philosophy of argument, argument as rhetoric, and argument in contexts. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 456. *RHETORIC: 500 BC TO 500 AD. (3 Credits)
History and philosophy of rhetorical principles. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 458. *RHETORIC: 500 AD TO 1900. (3 Credits)
History and philosophy of rhetorical principles. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 459. *CONTEMPORARY THEORIES OF RHETORIC. (3 Credits)
A survey of contemporary rhetorical theories from 1900 to the present. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 460. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1750 TO 1900. (3 Credits)
Speech criticism; great American speakers, relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 462. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1900-PRESENT. (3 Credits)
Speech criticism; great American speakers; relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 464. RHETORICAL CRITICISM. (3 Credits)
Explores the approaches to the criticism of rhetoric, including aesthetic, social movement, genre, feminist, and other modes of criticism.
Prerequisites: COMM 320 with D- or better

COMM 466. ETHICS OF RHETORIC. (3 Credits)
Examines the ethical questions raised by the use of persuasive discourse, including the derivation of standards of ethical persuasion and approaches to ethical judgment about persuasion. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 470. HISTORY OF SPEECH COMMUNICATION. (3 Credits)
Examines the theories and practices involved in the development of speech communication as a field and a discipline, with a special emphasis on the central roles played by rhetorical theory and criticism.
Prerequisites: COMM 320 with D- or better and COMM 321 [D-]

COMM 472. THE RHETORIC OF POPULAR CULTURE. (3 Credits)
A survey of theories of popular culture from Arnold to Hall. Students will examine various artifacts of popular culture and the influences they exert. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 476. ISSUES IN THE FREEDOM OF SPEECH. (3 Credits)
Examination of the theories of free expression and case materials related to tests of free speech in key U.S. Supreme Court cases. The course emphasizes the context of social and political movements from which the cases arise. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: COMM 320

COMM 478. POLITICAL CAMPAIGN RHETORIC. (3 Credits)
Theory, research and methods of political campaign rhetoric. Topics include rhetorical strategies and tactics in advertising, national conventions, broadcast debates, media coverage and public opinion polls. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 482. THE MEDIA IN CULTURE AND SOCIETY. (3 Credits)
The study of the societal-cultural impact on the media, and their effect upon individuals, social, cultural, political, economic, and leisure structures and systems. Special focus on the issues of media in shaping values, molding opinions, and reflecting/projecting attitudes, beliefs, and behaviors, including media’s role in racial, gender, and familial relations. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 280

COMM 484. MEDIA CRITICISM. (3 Credits)
A critical examination of the media analysis of content, forms and deployment of media messages and products. A critical study of the structure, functions and economics of media systems. A consideration of media ethics and responsibilities in relation to news and information, entertainment, advertising and marketing, and social-cultural influence. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 280

COMM 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.
Comm 503. Thesis. (1-16 Credits)
This course is repeatable for 999 credits.

Comm 505. Reading and Conference. (1-16 Credits)
This course is repeatable for 16 credits.

Comm 506. Projects. (1-16 Credits)
This course is repeatable for 16 credits.

Comm 507. Seminar. (1-16 Credits)
This course is repeatable for 16 credits.

Comm 508. Workshop. (1-16 Credits)
This course is repeatable for 16 credits.

Comm 510. Communication Internship. (1-12 Credits)
An assignment in a private or public business or agency. The student observes or works in one or more departments of the enterprise, perhaps in one area of interest or specialization (e.g., public relations, training, personnel, research and planning). Work is supervised by the agency staff, supervising school faculty member(s) provide academic evaluation. 12 credits maximum. Graded P/N. This course is repeatable for 12 credits.

Comm 512. Topics in Speech Communication. (3 Credits)
Contemporary issues in speech communication: appraisal and discussion of current theories, trends, research methods, problems, or applications. This course is repeatable for 9 credits. Recommended: 9 credits of speech communication.

Comm 514. Communication Research Methods. (3 Credits)
Communication research and its relationship to theory. Quantitative and qualitative methods of investigation in speech communication. Experimental and non-experimental research design; naturalistic observation; issues of reliability and validity; statistical analysis. Standards and principles of writing and reporting research. Recommended: Comm 321

Comm 516. Ethnography of Communication. (3 Credits)
Study and practice of using ethnography of communication as a research method for developing theory in communication studies; topics include data collection, analysis, and writing ethnographic reports. Recommended: Comm 321

Comm 517. Research Methods in Communication. (3 Credits)
Introduction to the structure, process, and logic of quantitative empirical research in communication. Topics include research design, measurement, methodology, and descriptive statistics. Think of this as a skills course, where you are going to learn how to understand, critique, and design quantitative methodological approaches. Note that this course is rigorous, and will hopefully challenge you to better understand how research applies to your life outside of the classroom.

Comm 518. Interpersonal Communication Theory and Research. (3 Credits)
Current theory, research, and practice in interpersonal communication. Issues addressed may include compliance gaining, nonverbal behavior, family communication, gender issues, impression formation, rules, and human relations. Recommended: Comm 321

Comm 520. Introduction to Graduate Study in Speech Communication. (3 Credits)
Introductory graduate seminar in the field of communication. Emphasis on the breadth and depth of the discipline, graduate study, and research directions.

Comm 522. Small-Group Communication Theory and Research. (3 Credits)
Current theory, research, and practice in communication and small-group communication. Issues addressed may include leadership, decision making, problem solving, training, and human relations. Recommended: Comm 321

Comm 524. Communication in Organizations: Theories and Issues. (3 Credits)
Analysis of human interaction within the informal and formal systems of organizations. Theory, research, and practice relevant to the analysis of the nature and role of communication within small, mid-range and highly complex organizations. The course addresses structural, functional, and cultural features of communication in organizational environments.

Comm 526. Intercultural Communication: Theories and Issues. (3 Credits)
Advanced study in intercultural communication theoretical developments and research directions. Topics addressed may include intercultural research methods, training, language and culture, acculturation, and intercultural effectiveness. Recommended: Comm 321 and Comm 326

Comm 527. Cultural Codes in Communication. (3 Credits)
Study and examination of the contextualized use of communication within speech communities and cultures; topics include the cultural patterning of communication and cultural communication theory.

Comm 530. Theoretical Issues in Communication Inquiry. (3 Credits)
Review of conceptual, philosophical, ontological, epistemological, and methodological issues in the development of theories in human communication; application to contemporary, empirical human communication research. Recommended: Comm 321

Comm 532. Gender and Communication. (3 Credits)
Investigation of impact of sex and gender on communication in conflict, decision-making, leadership, nonverbal messages, language, and interpersonal relationships. Focus on definitions of sex and gender in regard to knowledge, social constructs, and self-development. Recommended: Comm 321

Comm 537. Health Communication. (3 Credits)
This class is designed to unpack various elements of how communication impacts health, and vice versa. There are three main sections to this course: 1) discussing doctor-patient communication, 2) discussing the effects of health campaigns, and 3) discussing the link between communication and both psychological and physiological health.

Comm 540. Theories of Conflict and Conflict Management. (3 Credits)
Conflict on a variety of levels: intrapersonal, interpersonal, group, public, and social. Conflict in a variety of contexts: relationships, family, organizations, community, and society. Constructive and destructive means of confronting and managing conflict; social and psychological aspects of conflict; conflict analysis; causes of conflict; conflict and peace, social order, and social change; case studies of conflict. Recommended: Comm 321
COMM 542. BARGAINING AND NEGOTIATION PROCESSES. (3 Credits)
Theory and practice of bargaining and negotiation as means of settling
arbitration processes in the settlement of conflicts and disputes. Study
of the role of the third party neutral in the peace making process. Case
studies and simulations in mediation and arbitration.
Recommended: COMM 321

COMM 544. THIRD PARTIES IN DISPUTE RESOLUTION: MEDIATION/
ARBITRATION. (3 Credits)
Philosophies, strategies, practices, and characteristics of mediation and
arbitration processes in the settlement of conflicts and disputes. Study
to the history of ideas; rhetoric and political, social, cultural, and religious
of international conflicts and disputes. Scrutiny of contemporary world conflicts.
Recommended: COMM 321

COMM 546. COMMUNICATION IN INTERNATIONAL CONFLICT AND
DISPUTES. (3 Credits)
Examination of the nature of international conflicts and disputes and the
roles culture and communication play in resolving them constructively.
Analysis of negotiation, mediation, and international law as approaches
to dealing with international political, economic, cultural, and religious
disputes. Scrutiny of contemporary world conflicts.
Recommended: COMM 321

COMM 550. COMMUNICATION AND THE PRACTICE OF SCIENCE. (3
Credits)
Communication is central to science-based decision-making, the function
of science teams, the reporting and critique of scientific knowledge,
and the interface between science and policy making. This seminar
emphasizes communication competence in the arena of applied
science; that is, science as practiced in government agencies, private
corporations, and nonprofit organizations.

COMM 554. ADVANCED ARGUMENTATION. (3 Credits)
Advanced study in classical and current theories of the persuasive
and epistemological functions of argumentation. Examination of the
dominant contemporary theorists, including Toulmin, Perelman,
and Willard. Analysis of research and applied perspectives, including
conversational argument, argument fields, the philosophy of argument,
argument as rhetoric, and argument in contexts.
Recommended: COMM 320

COMM 556. RHETORIC: 500 BC TO 500 AD. (3 Credits)
History and philosophy of rhetorical principles.
Recommended: COMM 320

COMM 558. RHETORIC: 500 AD TO 1900. (3 Credits)
History and philosophy of rhetorical principles.
Recommended: COMM 320

COMM 559. CONTEMPORARY THEORIES OF RHETORIC. (3 Credits)
A survey of contemporary rhetorical theories from 1900 to the present.
Recommended: COMM 320

COMM 560. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES:
1750 TO 1900. (3 Credits)
Speech criticism; great American speakers, relation of their speaking
to the history of ideas; rhetoric and political, social, and religious
movements.
Recommended: COMM 320

COMM 562. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES:
1900-PRESENT. (3 Credits)
Speech criticism; great American speakers; relation of their speaking
to the history of ideas; rhetoric and political, social, and religious
movements.
Recommended: COMM 320

COMM 564. RHETORICAL CRITICISM. (3 Credits)
Explores the approaches to the criticism of rhetoric, including aesthetic,
social movement, genre, feminist, and other modes of criticism.
Recommended: COMM 320

COMM 565. RESEARCH METHODS IN RHETORIC. (3 Credits)
A graduate-level introduction to research methods in rhetorical studies.
Topics include rhetorical criticism, discourse analysis, and historiography.
Course goals include the ability to understand and critique common
methodological approaches in rhetorical studies.

COMM 566. ETHICS OF RHETORIC. (3 Credits)
Examines the ethical questions raised by the use of persuasive
discourse, including the derivation of standards of ethical persuasion and
approaches to ethical judgment about persuasion.
Recommended: COMM 320

COMM 572. THE RHETORIC OF POPULAR CULTURE. (3 Credits)
A survey of theories of popular culture from Arnold to Hall. Students
will examine various artifacts of popular culture popular culture and the
influences they exert.

COMM 576. ISSUES IN THE FREEDOM OF SPEECH. (3 Credits)
Examination of the theories of free expression and case materials related
to tests of free speech in key U.S. Supreme Court cases. The course
emphasizes the context of social and political movements from which the
cases arise.
Recommended: COMM 320

COMM 578. POLITICAL CAMPAIGN RHETORIC. (3 Credits)
Theory, research and methods of political campaign rhetoric. Topics
include rhetorical strategies and tactics in advertising, national
conventions, broadcast debates, media coverage and public opinion
polls.
Recommended: COMM 320

COMM 582. THE MEDIA IN CULTURE AND SOCIETY. (3 Credits)
The study of the societal-cultural impact on the media, and their
effect upon individuals, social, cultural, political, economic, and leisure
structures and systems. Special focus on the issues of media in shaping
values, molding opinions, and reflecting/projecting attitudes, beliefs,
and behaviors, including media’s role in racial, gender, and familial relations.
Recommended: COMM 280

COMM 584. MEDIA CRITICISM. (3 Credits)
A critical examination of the media analysis of content, forms and
deployment of media messages and products. A critical study of the
structure, functions and economics of media systems. A consideration
of media ethics and responsibilities in relation to news and information,
entertainment, advertising and marketing, and social-cultural influence.
Recommended: COMM 280

COMM 590. GRADUATE SEMINAR IN RHETORIC. (3 Credits)
Examines topics dealing with the current state of research in rhetorical
studies. This includes discussing a number of approaches to the
history, theory, and criticism of rhetoric, as well as to the relationship
between rhetoric and related disciplines. Course goals include increased
competence in understanding the current state of rhetorical theory and
research in the area being explored.
This course is repeatable for 9 credits.

COMM 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
COMM 808. WORKSHOP. (1-16 Credits)
Through reading, dialogue, reflection, and appreciative inquiry, participants will become more aware of our differences and similarities from an intercultural perspective. Through study and practice, participants will develop skills to more effectively communicate with culturally different others.
*This course is repeatable for 16 credits.*

**Graphic Design**

**GD 110. GRAPHIC DESIGN TOOLS AND TECHNIQUES. (4 Credits)**
A foundation-level course covering software skills and production techniques aimed at building a confident understanding and demonstration of the tools of design, making, craft, and delivery.

**GD 121. ADOBE SOFTWARE BASICS. (3 Credits)**
Instruction in drawing, editing, and layout techniques using Adobe Illustrator, and Photoshop CS6 and CC.
Equivalent to: DHE 121

**GD 126. GRAPHIC DESIGN PRO APPLICATION. (2 Credits)**
Required pre-graphic design course. Course will focus on the development of a final portfolio to be reviewed by the graphic design faculty at the end of the spring term. Lec/lab/studio.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 121 [C-] and ART 131 [C-]
Recommended: ART 120 and ART 122 and DHE 121

**GD 200. GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 1. (4 Credits)**
A second year level course (2 series) covering software skills and production techniques aimed at building a confident understanding and demonstration of the tools of design, making, craft, and delivery.

**GD 220. GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 2. (4 Credits)**
A second-year level course (2 series) covering software skills and production techniques aimed at building a confident understanding and demonstration of the tools of design, making, craft, and delivery.
Prerequisites: GD 200 with C- or better

**GD 224. INTERACTIVE DESIGN 1. (4 Credits)**
Introductory class to interactive design principles in the graphic design professional core.
Prerequisites: GD 126 with C- or better and GD 226 (may be taken concurrently) [C-] and GD 228 (may be taken concurrently) [C-]

**GD 226. TYPOGRAPHY 1. (4 Credits)**
An introductory course in the discipline, function and tradition of typography as it relates to visual and verbal communication.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 226

**GD 228. PROCESS: MAKING AND MEANING. (4 Credits)**
Course utilizes creative problem solving techniques, communication theories, combined with media explorations to bring together message, meaning, medium, and form.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 228

**GD 230. GRAPHIC DESIGN PROFESSIONAL DEVELOPMENT. (2 Credits)**
A required professional development course for graphic design sophomores aimed at preparing and empowering students to navigate professional opportunities 'as students'. This course is a prerequisite for GD 430 Graphic Design Practicum.

**GD 269. GRAPHIC DESIGN HISTORY. (3 Credits)**
A historical and theoretical overview of the evolution and innovations in graphic design.
Prerequisites: GD 126 with D- or better
Equivalent to: GD 369

**GD 300. GRAPHIC DESIGN ADVANCED TOOLS AND TECHNIQUES II. (4 Credits)**
An intermediate technology course covering software skills and production techniques for interactive and motion delivery, aimed at building a confident understanding and demonstration of the industry standard tools of interactive and time-based design.
Prerequisites: GD 210 with C- or better

**GD 312. CONTEMPORARY ISSUES IN DESIGN. (3 Credits)**
For all graphic design students in the professional graphic design program. The course examines contemporary design issues through reading, research, writing, presentations and discussion. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GD 126 with D- or better
Equivalent to: GD 412

**GD 325. GRAPHIC DESIGN: COLLABORATIVE PROCESSES. (4 Credits)**
Intermediate course in graphic design. Emphasis on collaborative projects exploring principles of group problem solving in typography.
Equivalent to: ART 325

**GD 326. TYPOGRAPHY 2. (4 Credits)**
An intermediate course exploring the design of organizational typographic structures and systems.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 326

**GD 327. TYPOGRAPHY 3. (4 Credits)**
An intermediate course exploring the visual, expressive vocabulary of typography, using innovative experimentation.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 327

**GD 328. INTERACTIVE 2. (4 Credits)**
An introduction to the contemporary issues of interactive design: experience design, application design, e-publication design, and from a visual communications perspective.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 328

**GD 330. GRAPHIC DESIGN AND SUSTAINABILITY. (4 Credits)**
An in-depth and hands-on exploration of the strategies, frameworks, and problem solving skills required for a sustainable and regenerative graphic design practice. Focus is on applying perspectives and systems thinking skills to design projects in the real world.
Prerequisites: GD 210 with C- or better

**GD 355. THE PHOTOGRAPHIC BOOK. (4 Credits)**
Practical studio course focusing on the photographic book in all of its forms. Use appropriated imagery as well as original imagery to create a variety of zines as well as soft and hardcover photo-books. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. CROSSLISTED as ART 355/ GD 355.
Prerequisites: ART 263 with C- or better
Equivalent to: ART 355
GD 369. GRAPHIC DESIGN HISTORY. (3 Credits)
An intermediate lecture course providing a historical and theoretical overview of the evolution and innovation in graphic design.
Equivalent to: ART 369, GD 269
Recommended: ART 204 and ART 205 and ART 206 and ART 367

GD 412. CONTEMPORARY ISSUES IN DESIGN. (3 Credits)
How contemporary culture shapes the practice of graphic design and how design shapes the culture in which we live. Issues examined through lectures, readings, discussion and writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ART 412

GD 419. PORTFOLIO REVIEW. (3 Credits)
A course to advise students during their final portfolio preparation. The objective is to complete the portfolio and hone presentation skills and techniques.
Prerequisites: GD 420 with C- or better
Equivalent to: ART 419

GD 420. PROFESSIONAL PRACTICES. (3 Credits)
Professional ethics and standards, business practices and tactics, and pre-press production techniques and concerns for graphic designers.
Prerequisites: GD 126 with D- or better
Equivalent to: ART 420

GD 421. INFORMATION AND PUBLICATION DESIGN. (4 Credits)
Theoretical and historical issues of organizing and visualizing statistics, numbers, and/or complex relationships. Emphasis on conceptualization, visual diagramming, and analysis of subtle visual relationships.
Equivalent to: ART 421

GD 422. NEW MEDIA: INTERACTIVE. (4 Credits)
An advanced course designing digital experiences with emphasis on innovative navigation, architectural structures, theoretical, and historical issues of new media.
Recommended: Junior block in graphic design and CS 295.

GD 423. EXPERIMENTAL TYPOGRAPHY. (4 Credits)
An advanced course in experimental typography focusing on intent, meaning, and method.
Equivalent to: ART 423

GD 424. BRAND IDENTITY SYSTEMS. (4 Credits)
Studio course that explores both the theory and the practice of brand identity systems, through the creation of a comprehensive visual branding project.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 424
This course is repeatable for 12 credits.

GD 426. GRAPHIC DESIGN CAPSTONE 1. (3 Credits)
The first in a two-course sequence of senior-level graphic design capstone courses. The focus is on applying more in-depth design research methods to graphic design senior capstone projects.
Prerequisites: GD 126 with C- or better and GD 426 [C-]
Equivalent to: GD 428

GD 427. CAPSTONE 2. (4 Credits)
The second in a two-course sequence of senior-level graphic design capstone courses. The focus is on the design and development of the senior capstone project.
Prerequisites: GD 126 with C- or better and GD 426 [C-]
Equivalent to: GD 428

GD 429. GRAPHIC DESIGN STUDIO. (4 Credits)
Provides opportunity for students to work with clients on actual projects in a professional environment. Lec/lab.
Equivalent to: ART 429
This course is repeatable for 16 credits.

GD 430. GRAPHIC DESIGN PRACTICUM. (2 Credits)
Works from the skills and lessons learned in GD 230, Professional Development, to provide a system of evaluation and reflection in a structured class environment for students in a graphic design internship or project-based practicum.
Prerequisites: GD 230 with C- or better
This course is repeatable for 8 credits.

GD 455. THE PHOTOGRAPHIC BOOK II. (4 Credits)
Practical studio course focusing on advanced practices and techniques in relation to the photographic book. Use appropriated imagery as well as original imagery to complete well-developed book projects. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. Advanced elements such as application of blanking, slip cases, screen printing, and other construction techniques will be taught. CROSSLISTED as ART 455/GD 455.
Prerequisites: ART 355 with C- or better
Equivalent to: ART 455

GD 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Music Education

MUED 100. MUSIC EDUCATION IN PUBLIC SCHOOLS. (3 Credits)
An introduction to the practice of teaching music in public schools in the United States. Participants will learn about teaching and learning music through reading, discussion, creative projects, field observations, and peer teaching experiences. Provides a breadth of experiences so prospective teachers can make informed decisions regarding their career path. While completion of this course does not guarantee admittance to the Music Education Program at OSU, it will prepare candidates for the admission process.
Prerequisites: MUS 121 with C or better

MUED 201. VOCAL DICTION SEMINAR I: LATIN AND GERMAN. (1 Credit)
A laboratory course in Latin and German vocal diction for choral music education majors. Emphasis on the pronunciation of sung texts and the International Phonetic Alphabet.
Prerequisites: MUED 100 with B- or better

MUED 202. VOCAL DICTION SEMINAR II: ITALIAN AND FRENCH. (1 Credit)
A laboratory course in Italian and French vocal diction for choral music education majors. Emphasis on the pronunciation of sung texts and the International Phonetic Alphabet.
Prerequisites: MUED 100 with B- or better

MUED 275. PROFESSIONAL SEMINAR IN MUSIC EDUCATION I. (1 Credit)
Provides a professional community for emerging music educators. Students will complete field-work, interact with field specialists and practitioners, and study emerging topics and contemporary practices in music education. Students will begin to develop their professional portfolios. This course begins a series of seminars, which will be dedicated to professional development the exploration of trends in music education.
Prerequisites: MUED 100 with B- or better

MUED 276. PROFESSIONAL SEMINAR IN MUSIC EDUCATION II. (1 Credit)
Continued engagement in field-work, interaction with field specialists and practitioners, and a study of emerging topics and contemporary practices in music education.
Prerequisites: MUED 100 with B- or better
MUED 277. PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR. (1 Credit)
MUED 277: Brass; MUED 277: Woodwinds; MUED 277: Strings;
MUED 277: Voice (Instrumentalists); MUED 277: Vocal Pedagogy
(Singers); MUED 277: Percussion; MUED 277: Guitar. Topics: performance
using proper beginning technique for each instrument, and description/
assessment of proper technique for each instrument at the intermediate
and advanced level. Emphasis is on techniques for teaching in classroom
settings.
This course is repeatable for 7 credits.

MUED 350. JAZZ PEDAGOGY. (1 Credit)
Explores basic concepts and pedagogies of jazz music as applicable
to the school jazz ensemble. Establishes a basic foundation of jazz
knowledge and pedagogy that can be built upon in future independent
learning endeavors.
Prerequisites: MUED 100 with B- or better

MUED 353. MUSIC EDUCATION IN PUBLIC SCHOOLS. (3 Credits)
Examines historical practices, philosophical differences and pedagogical
approaches that influence public school music programs. Field
experiences provide contextual models with genuine teaching
opportunities each week.
Prerequisites: MUS 121 with D- or better

MUED 375. PROFESSIONAL SEMINAR IN MUSIC EDUCATION III. (1 Credit)
Continued interaction with field specialists and practitioners, and study
of emerging topics and contemporary practices in music education.
Fieldwork focuses on instructional strategies for guiding critical thinking
and creative music listening.
Prerequisites: MUED 100 with B- or better

MUED 376. PROFESSIONAL SEMINAR IN MUSIC EDUCATION IV. (1 Credit)
Continued interaction with field specialists and practitioners, and study
of emerging topics and contemporary practices in music education.
Fieldwork focuses on observation, leadership of composition, and
improvization activities.
Prerequisites: MUED 100 with B- or better

MUED 391. SECONDARY GENERAL MUSIC FOUNDATIONS. (3 Credits)
Prepares the teacher candidate to design and facilitate experiences in
music learning appropriate for secondary students (grades 6 to 12).
Prerequisites: MUED 100 with B- or better

MUED 392. SEMINAR IN SECONDARY GENERAL MUSIC. (1 Credit)
Focuses on special topics (drumming) that follow evolving trends in
secondary general music education.
Prerequisites: MUED 100 with D- or better

MUED 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 406. PROJECT. (1 Credit)
Editing and refining of portfolio materials representing professional
growth in teaching throughout the Professional Teacher and Counselor
Education Program. Includes work samples, assessments, reflections,
and videotapes.
This course is repeatable for 18 credits.

MUED 408. WORKSHOP. (1-16 Credits)
May be repeated for a maximum of 18 credits.
This course is repeatable for 18 credits.

MUED 410. INTERNSHIP/STUDENT TEACHING. (1-10 Credits)
An immersive 60-day experience. Daily experience with communicating
content, planning, assessment, and classroom management in a guided
field setting. Student teaching is a requirement for Oregon licensure.
This course is repeatable for 99 credits.

MUED 413. THEORY AND PRACTICUM: FIELD. (1-4 Credits)
Field experience in music classroom. For pre-MAT students taking 4
credits, the experience is approximately 10 hours per week in elementary-
level classroom.

MUED 450. SURVEY OF WIND LITERATURE. (1 Credit)
Examines different time periods of wind band literature from the
Renaissance through current repertoire. Explores wind band literature
through study of the music and historical practices.
Prerequisites: MUED 326 with B- or better

MUED 460. PSYCHOLOGY OF MUSIC. (3 Credits)
The study and evaluation of psychological, physiological, and
neurological aspects of musical behavior and experience; including
but not limited to acoustics, human hearing, perception and cognition,
development and expertise, affective response and preference, unusual
abilities, and selected special topics.

MUED 469. MARCHING BAND TECHNIQUES LABORATORY. (1 Credit)
Provides an in-depth study of the unique techniques and demands of
running a marching band.
Prerequisites: MUS 121 with C or better

MUED 470. METHODS AND MATERIALS FOR THE PUBLIC SCHOOL WIND
BAND. (3 Credits)
Includes examination of method books, instructional materials, and
music for middle school and high school band. Class format is lecture,
discussions, and microteaching demonstrations. Includes study of past
and current methods of improving student musical understanding and
performance through band literature and rehearsal techniques.
Recommended: MUS 318 and MUS 319

MUED 471. INVESTIGATING MUSICAL CULTURES. (3 Credits)
Immerse yourself in an unfamiliar musical culture and learn how to
teach students about it. Become better prepared to work effectively with
multicultural materials, and to use culturally appropriate pedagogical
approaches. Music will be emphasized as a gateway to cultural
understanding, but previous musical experience is not required.

MUED 473. METHODS FOR TEACHING ELEMENTARY MUSIC. (3 Credits)
Focuses on pedagogical content knowledge in music for specialists
preparing to teach Kindergarten through grade five. Students will
focus on the developmental characteristics of learners, repertoire
and instructional techniques appropriate for the elementary music classroom,
and lesson planning incorporating state and national standards. Issues
related to diverse and special needs populations will be interwoven
throughout each segment of the course.
Prerequisites: MUED 353 with D- or better

MUED 474. ELEMENTARY APPROACHES SEMINAR I. (1 Credit)
Topics include practical applications of varied teaching methods, lesson
planning, curricular design, repertoire, and resources for the general
music classroom at the elementary level.
Prerequisites: MUED 473 with B- or better
MUED 475. ELEMENTARY APPROACHES SEMINAR II. (1 Credit)
Provides the foundation for teacher candidates to develop a critical disposition regarding contemporary issues in the general music classroom.
Prerequisites: MUED 473 with B- or better

MUED 477. CLASSROOM INSTRUMENTAL TECHNIQUES. (2 Credits)
A brief overview of fundamental principles and playing techniques of brass, percussion, string, and woodwind instruments designed for the choral music educator who uses instrumental accompaniment or conducts an instrumental ensemble.
Recommended: MUS 222 and MUS 234 and MUS 319

MUED 480. CLASSROOM CHORAL METHODS. (3 Credits)
Examines research, theory, and pedagogical methods of choral classrooms. Primary topics: the role of choral music in various school settings and the responsibilities of the music teacher in developing/implementing goals and objectives for a choral music education curriculum.
Prerequisites: MUED 100 with B- or better

MUED 499. SPECIAL STUDIES. (1-16 Credits)
May be repeated for a maximum of 18 credits. This course is repeatable for 18 credits.

MUED 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MUED 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 506. PROJECTS. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 507. THEORY AND PRACTICUM SEMINAR. (1-4 Credits)
Field experience in music classroom. This course is repeatable for 10 credits.

MUED 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 510. PROFESSIONAL INTERNSHIP. (3-15 Credits)
A supervised teaching experience at a variety of public school levels. The student works with an experienced mentor teacher, accepting the professional responsibilities of teaching. This course is repeatable for 15 credits.

MUED 521. SPECIAL TOPICS IN MUSIC ED. (3 Credits)
Advanced pedagogy in one particular area within music education, such as jazz band techniques, computer design of marching band drills, advanced technology in music education. Topics will vary.

MUED 560. PSYCHOLOGY OF MUSIC. (3 Credits)
The study and evaluation of psychological, physiological, and neurological aspects of musical behavior and experience; including but not limited to acoustics, human hearing, perception and cognition, development and expertise, affective response and preference, unusual abilities, and selected special topics.

MUED 562. RESEARCH IN MUSIC EDUCATION. (3 Credits)
Introduction to the historical, philosophical, quantitative and qualitative research methodologies in music education. Includes interpretation and application of findings published in major research journals.

MUED 570. METHODS AND MATERIALS FOR THE PUBLIC SCHOOL WIND BAND. (3 Credits)
Includes examination of method books, instructional materials, and music for middle school and high school band. Class format is lecture, discussions, and microteaching demonstrations. Includes study of past and current methods of improving student musical understanding and performance through band literature and rehearsal techniques.

MUED 571. INVESTIGATING MUSICAL CULTURES. (3 Credits)
Immerse yourself in an unfamiliar musical culture and learn how to teach students about it. Become better prepared to work effectively with multicultural materials, and to use culturally appropriate pedagogical approaches. Music will be emphasized as a gateway to cultural understanding, but previous musical experience is not required.

MUED 573. METHODS FOR TEACHING ELEMENTARY MUSIC. (3 Credits)
Focuses on pedagogical content knowledge in music for specialists preparing to teach Kindergarten through grade five. Students will focus on the developmental characteristics of learners, multiple representations of the subject matter, and lesson planning incorporating state and national standards. Issues related to diverse and special needs populations will be interwoven throughout each segment of the course.
Recommended: MUED 353

MUED 574. MIDDLE LEVEL MUSIC EDUCATION. (3 Credits)
This methods course focuses on general music education, grades four through eight. Students explore relationships between teaching and learning in order to effectively plan for instruction.

MUED 580. SECONDARY VOCAL MUSIC EDUCATION. (3 Credits)
This methods course focuses on vocal music education, grades nine through twelve. Students explore relationships between teaching and learning in order to effectively plan for instruction.

MUED 581. SECONDARY INSTRUMENTAL MUSIC EDUCATION. (3 Credits)
This methods course focuses on instrumental music education, grades nine through twelve. Students explore relationships between teaching and learning in order to effectively plan for instruction.

MUED 591. CURRICULUM FOUNDATIONS IN MUSIC EDUCATION. (3 Credits)
Examination of historical, philosophical, and social influences on contemporary music education emphasizing 1950 through the present, culminating in the National Standards for Arts Education.

MUED 592. FOUNDATIONS OF MUSIC EDUCATION II:. (3 Credits)
CURRICULUM IMPLEMENTATION AND EVALUATION Students design and construct a comprehensive music education curriculum grounded in current research, the National Standards for Arts Education and Oregon's Common Curriculum Goals.

MUED 593. MUSIC TECHNOLOGY. (3 Credits)
Specific applications for teaching music incorporating appropriate software and hardware for curricular integration and curricular evolution.

MUED 599. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 18 credits.

Music Studio

MUP 161. INDIVIDUAL LESSONS: BEGINNING STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 162. INDIVIDUAL LESSONS: BEGINNING BRASS. (1-2 Credits)
This course is repeatable for 12 credits.
MUP 163. INDIVIDUAL LESSONS: BEGINNING WOODWINDS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 164. INDIVIDUAL LESSONS: BEGINNING VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 165. INDIVIDUAL LESSONS: BEGINNING PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 170. INDIVIDUAL LESSONS: INTERMEDIATE PIANO. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 171. INDIVIDUAL LESSONS: INTERMEDIATE STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 172. INDIVIDUAL LESSONS: INTERMEDIATE BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 173. INDIVIDUAL LESSONS: INTERMEDIATE WOODWINDS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 174. INDIVIDUAL LESSONS: INTERMEDIATE VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 175. INDIVIDUAL LESSONS: INTERMEDIATE PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 190. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 191. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 192. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 193. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 194. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 195. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 196. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
This course is repeatable for 12 credits.
Recommended: MUS 164

MUP 290. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 291. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 292. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 293. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 294. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 295. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 296. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
This course is repeatable for 12 credits.
Recommended: MUS 162 or MUS 362

MUP 390. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 391. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 392. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 393. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 394. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 395. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 396. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
This course is repeatable for 12 credits.
Recommended: MUS 162 or MUS 362

MUP 398. JUNIOR RECITAL. (1 Credit)
Time is dedicated towards the applied music project for junior music performance majors. A public recital will be given during junior-level applied study with the approval of the applied teacher. Graded P/N.

MUP 490. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 491. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 492. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 493. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 494. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 495. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 496. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
This course is repeatable for 12 credits.
Recommended: MUS 162 or MUS 362

MUP 498. SENIOR RECITAL. (1 Credit)
Time is dedicated towards the final applied music project for instrumental and voice music majors. A public recital will be given after the completion of junior-level applied study with the approval of the applied teacher. Graded P/N.

MUP 590. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 591. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 592. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.
MUP 594. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 595. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

Music

MUS 101. *MUSIC APPRECIATION I: SURVEY. (3 Credits)
Dealing primarily with the Western classical tradition, the course focuses on developing perceptive listening skills through the study of musical forms and styles. For non-majors. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 101H

MUS 101H. *MUSIC APPRECIATION I: SURVEY. (3 Credits)
Dealing primarily with the Western classical tradition, the course focuses on developing perceptive listening skills through the study of musical forms and styles. For non-majors. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 101

MUS 102. *MUSIC APPRECIATION II: PERIODS AND GENRES. (3 Credits)
A study of the masterworks of a single era (such as Baroque, classic, romantic, twentieth century) or a genre (such as orchestra, chamber, opera, musical theatre). For non-majors. Need not be taken in order. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 102H
This course is repeatable for 12 credits.

MUS 102H. *MUSIC APPRECIATION II: PERIODS AND GENRES. (3 Credits)
A study of the masterworks of a single era (such as Baroque, classic, romantic, twentieth century) or a genre (such as orchestra, chamber, opera, musical theatre). For non-majors. Need not be taken in order. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 102
This course is repeatable for 12 credits.

MUS 103. *MUSIC APPRECIATION III: GREAT COMPOSERS. (3 Credits)
The life and works of one or more significant composers including Bach, Haydn, Mozart, Beethoven, and others. For non-majors. Does not need to be taken in sequence. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 103H
This course is repeatable for 18 credits.

MUS 104. SURVEY OF JAZZ. (3 Credits)
Explores the historical, sociological and artistic development of jazz, America’s musical art form. A concise review of the first 100 years of the music from its blues-based roots at the turn of the 20th century to its current eclectic state will constitute the main framework of the course. While the focus will be on the important performers and composers of jazz, key historical and social events that contributed to the evolution of the idiom will also be discussed.

MUS 107. INTRODUCTION TO DIGITAL AUDIO WORKSTATIONS AND PUBLISHING. (3 Credits)
An introduction to project based music composing applications to create original music, remixes and contemporary productions. Students build skills through weekly exercises in both Reaper and MuseScore notation software.
This course is repeatable for 6 credits.

MUS 108. *MUSIC CULTURES OF THE WORLD. (3 Credits)
Survey of the world’s music with attention to musical styles and cultural contexts. Included are Oceania, Indonesia, Africa, Asia, Latin America. For non-majors. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: MUS 108H
This course is repeatable for 18 credits.

MUS 108H. *MUSIC CULTURES OF THE WORLD. (3 Credits)
Survey of the world’s music with attention to musical styles and cultural contexts. Included are Oceania, Indonesia, Africa, Asia, Latin America. For non-majors. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: MUS 108
This course is repeatable for 18 credits.

MUS 111. THE FUNDAMENTALS OF MUSIC TECHNOLOGY. (3 Credits)
Covers the principles and approaches used in contemporary music technology. Lectures and demonstrations will be rooted in physics, psychoacoustics, digital and analog recording, various software and hardware platforms, composition, and audio production in order to give students greater context into the creative and technical avenues of the music technologist.

MUS 112. INTRODUCTION TO DIGITAL AUDIO. (3 Credits)
Students will develop a thorough understanding of digital audio in both theory and application. Topics to be explored include common DAW operations, CD authoring, audio for web, sound design, MIDI, songwriting and composition, and digital effects. Course projects will engage students in both technical and creative capacities of digital audio production.
Prerequisites: MUS 111 with C- or better

MUS 113. AUDIO TECHNOLOGIES. (3 Credits)
Students will gain a thorough understanding of the technical and creative potential of various audio equipment used in sound production including microphones, speakers, mixers, recording equipment, effects processors, patch bays, MIDI, and various video equipment. Through discussion and experimentation, students will pursue real-world audio problems in collaborative and individual projects.
Prerequisites: MUS 111 with C- or better

MUS 114. FOUNDATIONS: APPLIED LISTENING AND THEORY. (3 Credits)
A general music foundation series that facilitates students with no prior formal musical background to develop contemporary music literacy using modes of listening including radio, digital music libraries, interactive tutorials and guided listenings and visual mapping.
This course is repeatable for 6 credits.

MUS 121. LITERATURE AND MATERIALS OF MUSIC I. (3 Credits)
Covers fundamentals of music theory along with a brief introduction to Western art music. This requires students to learn to read and write all notes in treble and bass clef, and all common scales, intervals, triads and seventh chords, using key signatures. They also learn to recognize basic rhythms and write them down.
This course is repeatable for 6 credits.
MUS 122. LITERATURE AND MATERIALS OF MUSIC I. (3 Credits)
An integrated, team-taught approach to the study of Western art music, including repertory, melodic, harmonic, and rhythmic components, formal organization, and composition. Recitation included.
Recommended: MUS 121

MUS 123. LITERATURE AND MATERIALS OF MUSIC I. (3 Credits)
An integrated, team-taught approach to the study of Western art music, including repertory, melodic, harmonic, and rhythmic components, formal organization, and composition. Recitation included. Lec/lab/rec.
Recommended: MUS 122

MUS 125. LITERATURE AND MATERIALS LAB I. (1 Credit)
Scales, all major and harmonic form of minor, interval drill.
Equivalent to: MUS 124
Recommended: MUS 121. Concurrent enrollment in MUS 122 for music majors

MUS 126. LITERATURE AND MATERIALS LAB II. (1 Credit)
Transpose scores, harmonic idioms, harmonic progressions. Lec/lab.
Equivalent to: MUS 125
Recommended: MUS 122 and MUS 125. Concurrent enrollment in MUS 123 for music majors

MUS 134. AURAL SKILLS I. (1 Credit)
Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music.
Corequisites: MUS 121

MUS 135. AURAL SKILLS II. (1 Credit)
Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music.
Recommended: Concurrent enrollment with MUS 122

MUS 136. AURAL SKILLS I. (1 Credit)
Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music.
Recommended: MUS 135 and concurrent enrollment in MUS 123

MUS 137. JAZZ IMPROVISATION. (1-3 Credits)
Instrumental and vocal improvisation including composition and arranging techniques.
This course is repeatable for 9 credits.

MUS 140. OSU CHAMBER CHOIR. (1-2 Credits)
A select ensemble of approximately 40 mixed voices. Performances each term. Annual tours. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 146. WOMEN’S CHOIR. (1-2 Credits)
A women’s ensemble designed for vocal development and exploration of treble choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 147. MEN’S CHOIR. (1-2 Credits)
A men’s ensemble designed for vocal development and exploration of TTBB choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 150. SYMPHONIC BAND. (1 Credit)
A select ensemble of approximately 80 wind and percussion players. Performance each term. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 151. CAMPUS BAND. (1 Credit)
Wind and percussion ensemble of approximately 70 players. Performance each term. Open to all students.
This course is repeatable for 9 credits.

MUS 152. RHYTHM AND BEAVS PEP BAND. (1 Credit)
An auditioned group of 12 musicians who perform at university, community, and athletic events throughout the year.
This course is repeatable for 9 credits.

MUS 153. MARCHING BAND. (1-2 Credits)
A marching and playing unit of more than 160 musicians. Performs for home football games.
This course is repeatable for 6 credits.

MUS 154. BASKETBALL BAND. (1 Credit)
An ensemble of approximately 50 players. Performs for home games.
This course is repeatable for 3 credits.

MUS 155. COLOR GUARD. (1 Credit)
A derivative of the Marching Band Color Guard, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 9 credits.

MUS 156. INDOOR DRUM LINE. (1-2 Credits)
A derivative of the Marching Band Drum Line, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 9 credits.

MUS 157. SMALL JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 158. LARGE JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 160. UNIVERSITY SYMPHONY ORCHESTRA. (1 Credit)
An ensemble of 65-80 players. Performance of orchestral repertoire from the eighteenth, nineteenth, and twentieth centuries. Performance each term. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 162. CHAMBER ENSEMBLE: GUITAR. (1 Credit)
A guitar performance group designed to explore ensemble rehearsal techniques and repertoire.
This course is repeatable for 9 credits.

MUS 163. ACCOMPANYING. (1 Credit)
Piano accompanying and chamber music skills, studio experience and weekly performance class.
This course is repeatable for 9 credits.
Recommended: Concurrent enrollment in MUS 190 or MUS 290

MUS 164. CHAMBER ENSEMBLE: STRINGS. (1 Credit)
This course is repeatable for 9 credits.

MUS 165. CHAMBER ENSEMBLE: WOODWINDS. (1 Credit)
This course is repeatable for 9 credits.

MUS 166. CHAMBER ENSEMBLE: BRASS. (1 Credit)
This course is repeatable for 9 credits.

MUS 167. CHAMBER ENSEMBLE: PERCUSSION. (1 Credit)
This course is repeatable for 9 credits.
MUS 168. CHAMBER ENSEMBLE: MISCELLANEOUS. (1 Credit)
This course is repeatable for 9 credits.

MUS 169. OPERA WORKSHOP. (1-2 Credits)
This course is repeatable for 3 credits.

MUS 171. GROUP LESSONS: PIANO I. (1 Credit)
Part 1 of the first-year group piano sequence. Group instruction in piano skills and basic theory.

MUS 172. GROUP PIANO II. (1 Credit)
Part 2 of the first-year group piano sequence. A continuation of MUS 171.
Prerequisites: MUS 171 with C- or better

MUS 173. GROUP PIANO III. (1 Credit)
Part 3 of the first-year group piano sequence. A continuation of MUS 172.
Prerequisites: MUS 172 with C- or better

MUS 177. GROUP LESSONS: PIANO. (1 Credit)
Beginning Piano I, elementary group instruction in piano skills for non-majors.
This course is repeatable for 2 credits.

MUS 178. GROUP LESSONS: PIANO. (1 Credit)
Beginning Piano II: Continuation of MUS 177, piano for non-majors.
This course is repeatable for 2 credits.

MUS 185. VOICE CLASS. (1 Credit)
Students improve and strengthen the voice as a solo instrument.
This course is repeatable for 9 credits.

MUS 186. GROUP GUITAR. (1 Credit)
Teaches fundamentals of the guitar in a small-group setting. Emphasis on practical use of the instrument.
This course is repeatable for 9 credits.

MUS 187. GROUP GUITAR II. (1 Credit)
A continuation of MUS 186, MUS 187 focuses on helping students learn higher functionality in techniques and attain greater ability to perform solo or in ensemble.
Prerequisites: MUS 186 with D- or better
This course is repeatable for 9 credits.

MUS 190. APPLIED MUSICIANSHIP: BEGINNER BEAT MAKING (DAW). (2 Credits)
Teaches the process involved in composing and constructing drum beats for any style of popular music. This course will take you through the basics of understand the roles of each individual drum on a typical drum kit, to programming on an 808 or sequenced style virtual kit. We will also explore putting together your own collection of sounds and building drum and percussion kits for your own creative applications and compositions.
Prerequisites: MUS 111 with C or better
This course is repeatable for 6 credits.

MUS 199. SPECIAL STUDIES. (1-3 Credits)
First-year level.
This course is repeatable for 18 credits.

MUS 201. ENGLISH AND LATIN DICTION FOR SINGERS. (1 Credit)
Presents the principles of lyric diction in English and Latin and provides practice in the skills needed to sing the languages accurately and expressively.

MUS 202. ITALIAN LYRIC DICTION FOR SINGERS. (1 Credit)
Presents the principles of lyric diction in Italian and provides practice in the skills needed to sing the languages accurately and expressively.
Prerequisites: MUS 201 with C or better

MUS 203. GERMAN LYRIC DICTION FOR SINGERS. (1 Credit)
Presents the principles of German lyric diction and provides practice in the skills needed to sing the language accurately and expressively.
Prerequisites: MUS 201 with C or better

MUS 204. FRENCH LYRIC DICTION FOR SINGERS. (1 Credit)
Presents the principles of French lyric diction and provides practice in the skills needed to sing the language accurately and expressively.
Prerequisites: MUS 201 with C or better

MUS 216. THE MUSIC BUSINESS. (3 Credits)
An overview of the many elements that comprise today's music industry, with an emphasis on the most recent entrepreneurial and creative trends in this multi-billion-dollar business.

MUS 221. LITERATURE AND MATERIALS OF MUSIC. (3 Credits)
Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century.
Recommended: MUS 123

MUS 222. LITERATURE AND MATERIALS OF MUSIC. (3 Credits)
Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century. Three lectures weekly.
Recommended: MUS 221

MUS 223. LITERATURE AND MATERIALS OF MUSIC. (3 Credits)
Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century. Three lectures weekly.
Recommended: MUS 222

MUS 234. AURAL SKILLS II. (1 Credit)
Sight-singing; melodic and harmonic dictation. To be taken in sequence.
Recommended: MUS 123 and MUS 136

MUS 235. AURAL SKILLS II. (1 Credit)
Sight-singing; melodic and harmonic dictation. To be taken in sequence.
Recommended: MUS 234

MUS 236. AURAL SKILLS II. (1 Credit)
Sight-singing; melodic and harmonic dictation. To be taken in sequence.
Recommended: MUS 235

MUS 251. INTRO TO ARTS ENTREPRENEURSHIP. (3 Credits)
Introduction to Arts Entrepreneurship emphasizes the importance of entrepreneurial thinking in the arts while engaging students with the fundamentals of the arts “business”. The focus of this course is the development of each student’s Digital Portfolio. Each student will explore the arts industry through first-hand experiences with creative problem-solving exercises, discussion questions, collaborative projects, case studies, and hands-on activities. For majors. (FA)
This course is repeatable for 3 credits.

MUS 271. GROUP PIANO IV. (1 Credit)
Part of the second-year group piano sequence. Group instruction in piano skills and basic theory.

MUS 272. GROUP PIANO V. (1 Credit)
Part of the second-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 271 with C- or better

MUS 273. GROUP PIANO VI. (1 Credit)
Part of the second-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 272 with C- or better
MUS 279. INTRODUCTION TO SONGWRITING 1. (3 Credits)
The study of songs and songwriting will be introduced, with special
attention paid to the art of lyrics, melody, harmony, and structure to create
songs. Songs will be analyzed and composed, and students will listen to
popular American songwriting throughout modern history. Students are
expected to listen critically and create and collaborate on original song
lyrics and music.
This course is repeatable for 6 credits.

MUS 299. SPECIAL STUDIES. (1-3 Credits)
Sophomore level.
This course is repeatable for 18 credits.

MUS 301. SOLO VOCAL REPERTOIRE: ENGLISH. (2 Credits)
Survey of the development of English solo vocal literature from the
Renaissance period to the present.
Prerequisites: MUS 123 with C or better

MUS 302. SOLO VOCAL REPERTOIRE: ITALIAN. (2 Credits)
Survey of the development of Italian solo vocal literature from the
Renaissance period to the present.
Prerequisites: MUS 123 with C or better

MUS 303. SOLO VOCAL REPERTOIRE: GERMAN. (2 Credits)
Survey of the development of German solo vocal literature from the
Renaissance period to the present.
Prerequisites: MUS 123 with C or better

MUS 304. SOLO VOCAL REPERTOIRE: FRENCH. (2 Credits)
Survey of the development of French solo vocal literature from the 19th
century to the present.
Prerequisites: MUS 123 with C or better

MUS 309. WOMEN IN WESTERN MUSIC. (3 Credits)
Explores the powerful roles women have played in both Western classical
and popular music, from the Medieval Era to the present day. Drawing
on historical, contemporary, and cross-cultural ideas and repertoire, the
course will identify contributions women have made as composers,
performers, patrons, educators, and consumers, and will examine why
women’s contributions were ignored in the past. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

MUS 311. MIDI SYSTEMS AND APPLICATIONS. (3 Credits)
Students will develop a thorough understanding of the Musical
Instrument Digital Interface (MIDI) language. Using both hardware and
software environments, they will learn technical and creative approaches
to live and studio MIDI applications expected of the industry professional.
Prerequisites: MUS 112 with C or better

MUS 313. SOUND SYNTHESIS. (3 Credits)
Examines the various forms of synthesis used in modern electronic
music and audio production. Throughout the course of the term, students
will cultivate listening, programming, and analytical skills through the
study of analog and digital synthesis. Emphasis will be placed on practical applications of synthesis through original creative projects.
Prerequisites: MUS 213 with C or better

MUS 315. INTRODUCTION TO CONDUCTING. (2 Credits)
Basic terminology, beat patterns, and baton technique. Introduction to
score preparation. Philosophy and history of conducting are also addressed.
Recommended: MUS 223 and MUS 236 and piano proficiency exam.

MUS 316. CHORAL CONDUCTING. (2 Credits)
Continuation of MUS 315. Hand gesture technique, score reading, and
score preparation of literature from all major historical periods. Focus
upon principles of developing choral excellence. Includes conducting
practice with a campus ensemble. To be taken in sequence.
Recommended: MUS 315

MUS 317. CHORAL CONDUCTING. (2 Credits)
Continuation of MUS 315. Hand gesture technique, score reading, and
score preparation of literature from all major historical periods. Focus
upon principles of developing choral excellence. To be taken in sequence.
Recommended: MUS 315

MUS 318. INSTRUMENTAL CONDUCTING. (2 Credits)
Continuation of MUS 315, including types of instrumental groups, seating
arrangements, score preparation, and instrumental transposition and
ranges. Advanced baton technique. To be taken in sequence.
Recommended: MUS 315

MUS 319. INSTRUMENTAL CONDUCTING. (2 Credits)
Continuation of MUS 315, including types of instrumental groups, seating
arrangements, score preparation, and instrumental transposition and
ranges. Advanced baton technique. To be taken in sequence.
Recommended: MUS 315

MUS 321. LITERATURE AND MATERIALS OF MUSIC III. (3 Credits)
Twentieth century harmony and counterpoint, including contrapuntal
composition. Continued study and analysis of repertoire into the 21st
century.
Recommended: MUS 223

MUS 324. HISTORY OF WESTERN MUSIC. (3 Credits)
Chronological survey of the Euro-American traditions in music to be taken
in sequence.
Prerequisites: MUS 123 with D- or better
Recommended: MUS 223

MUS 325. HISTORY OF WESTERN MUSIC. (3 Credits)
Traces the development of music history from the early Classic period
through the end of the 19th century. Major trends in orchestral, solo,
chamber and vocal music are explored through lectures, readings,
research, discussion, score studies, and intensive writing assignments.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MUS 123 with D- or better
Recommended: MUS 223

MUS 326. HISTORY OF WESTERN MUSIC. (3 Credits)
Chronological survey of the Euro-American traditions in music to be taken
in sequence.
Prerequisites: MUS 123 with D- or better
Recommended: MUS 223

MUS 330. ALEXANDER TECHNIQUE FOR MUSICIANS. (1 Credit)
A theoretical and practical introduction to the Alexander Technique, a
psychophysical reeducation process developed by F.M. Alexander. The
course will provide the opportunity for instrumentalists and singers to
integrate the Alexander Technique into their practice and performance,
thereby enabling more freedom of choice in their approach to music making.
Prerequisites: MUS 123 with D- or better
This course is repeatable for 6 credits.

MUS 337. JAZZ IMPROVISATION. (1-3 Credits)
Instrumental and vocal improvisation including composition and
arranging techniques.
This course is repeatable for 9 credits.
Recommended: Two years college-level MUS 137 experience
MUS 340. OSU CHAMBER CHOIR. (1-2 Credits)
A select ensemble of approximately 40 mixed voices. Performance each term. Annual tours. Students must have two years college-level vocal experience or equivalent. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 341. VOCAL PEDAGOGY I. (2 Credits)
Provides an understanding of the singing voice and establishes guidelines for teaching vocal techniques. Explores the anatomical, physiological and acoustic elements of singing, providing students with a working knowledge of the vocal mechanism.
Prerequisites: MUP 291 with C or better

MUS 344. INSTRUMENTAL PEDAGOGY AND REPETTOIRE. (3 Credits)
This course is directed towards the student who anticipates a career as a professional musician in a performance group, soloist, or as an instrumental studio instructor.
Recommended: Music lessons MUP 300 or higher

MUS 346. WOMEN’S CHOIR. (1-2 Credits)
A women’s ensemble designed for vocal development and exploration of treble choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 347. MENS CHOIR. (1-2 Credits)
A men’s ensemble designed for vocal development and exploration of TTBB choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 350. SYMPHONIC BAND. (1 Credit)
A select ensemble of approximately 80 wind and percussion players. Performance winter and spring terms. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 351. CAMPUS BAND. (1 Credit)
Wind and percussion ensemble of approximately 70 players. Performance each term. Open to all students.
This course is repeatable for 9 credits.

MUS 352. RHYTHM AND BEAVS PEP BAND. (1 Credit)
An auditioned group of 12 musicians who perform at university, community, and athletic events throughout the year.
This course is repeatable for 9 credits.

MUS 353. MARCHING BAND. (1-2 Credits)
A marching and playing unit of more than 160 musicians. Performs for home football games; one trip each year to an off-campus game.
This course is repeatable for 6 credits.

MUS 354. BASKETBALL BAND. (1 Credit)
An ensemble of approximately 50 players. Performs for home games. Students must have two years college-level experience.
This course is repeatable for 3 credits.

MUS 355. COLOR GUARD. (1 Credit)
A derivative of the Marching Band Color Guard, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 3 credits.

MUS 356. INDOOR DRUM LINE. (1-2 Credits)
A derivative of the Marching Band Drum Line, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 3 credits.

MUS 357. SMALL JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 358. LARGE JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 360. UNIVERSITY SYMPHONY ORCHESTRA. (1 Credit)
An ensemble of 65-80 players. Performance of orchestral repertoire from the 18th, 19th, and 20th centuries. Performance each term. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 362. CHAMBER ENSEMBLE: GUITAR. (1 Credit)
A guitar performance group designed to explore ensemble rehearsal techniques and repertoire.
This course is repeatable for 9 credits.
Recommended: MUP 196 or MUP 296 or MUP 396 or MUP 496

MUS 363. ACCOMPANYING. (1 Credit)
Piano accompanying and chamber music skills, studio experience, and weekly performance class.
This course is repeatable for 9 credits.
Recommended: Concurrent enrollment in MUS 390 or MUS 490. Two years college-level ensemble.

MUS 364. CHAMBER ENSEMBLE: STRINGS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 365. CHAMBER ENSEMBLE: WOODWINDS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 366. CHAMBER ENSEMBLE: BRASS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 367. CHAMBER ENSEMBLE: PERCUSSION. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 368. CHAMBER ENSEMBLE: MISCELLANEOUS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 369. OPERA WORKSHOP. (1-2 Credits)
This course is repeatable for 3 credits.

MUS 371. GROUP PIANO VII. (1 Credit)
Part of the third-year group piano sequence. Group instruction in piano skills and basic theory.

MUS 372. GROUP PIANO VIII. (1 Credit)
Part of the third-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 371 with C- or better

MUS 373. GROUP PIANO IX. (1 Credit)
Part of the third-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 372 with C- or better
MUS 375. INTRODUCTION TO PIANO TUNING. (3 Credits)
Provides an introduction to the science of piano tuning and general piano maintenance. Students will acquire knowledge of the construction of the modern piano and its predecessors. They will learn about the temperaments and the science of tuning. Finally, through supervised instruction and practice, students will learn the skill of how to tune a modern piano.
This course is repeatable for 6 credits.

MUS 378. MUSICAL WELLNESS FOR PIANISTS. (3 Credits)
Pianists are offered a body of knowledge that enables them to cultivate mindful, healthful learning and performance processes for themselves and their students. Special focus is given to dealing with fatigue, physical limitations, and injuries.
This course is repeatable for 6 credits.

MUS 399. SPECIAL STUDIES. (1-3 Credits)
Junior level.
This course is repeatable for 18 credits.

MUS 400. STUDIES IN WRITING ABOUT MUSIC. (3 Credits)
Students will read relevant literature pertaining to a selected topic. These readings will be discussed during the class period, serve as a basis of knowledge for the writing assignments throughout the quarter, and promote critical thinking about the topic. As a Writing Intensive Course (WIC), a large portion of the term will be devoted to learning various genres of writing about music, including formal writing and informal, low-stakes writing. Students will be introduced to a variety of ways of writing about music through the course readings and will learn how to tailor one's writing style towards a genre's particular audience. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MUS 325 with C or better
Recommended: Completion of a WR II course

MUS 401. RESEARCH AND SCHOLARSHIP. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 402. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 403. THESIS. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 405. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 406. PROJECTS. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 407. SEMINAR. (1-6 Credits)
Equivalent to: MUS 407H
This course is repeatable for 18 credits.

MUS 408. WORKSHOP. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 409. PIANO PEDAGOGY PRACTICUM. (2 Credits)
A practical application course offering experiential learning and supervised teaching experiences to piano pedagogy students. Serves as a practicum co-requisite for the final two terms of Piano Pedagogy (MUS 446 and MUS 447).
Corequisites: MUS 446, MUS 447
This course is repeatable for 8 credits.

MUS 410. INTERNSHIP. (3 Credits)
Provides experience in field settings, opportunity to develop personal and professional skills. See school for details.
This course is repeatable for 12 credits.

MUS 442. GENRE STUDIES. (3 Credits)
Intensive study of selected genres, such as orchestra, chamber music, keyboard literature, vocal literature, music theatre and opera.
Equivalent to: MUS 442H
This course is repeatable for 18 credits.

MUS 443. THEORY AND COMPOSITION STUDIES. (3 Credits)
Intensive study of selected subjects, such as analysis, composition, choral arranging, band arranging, and orchestration.
This course is repeatable for 18 credits.

MUS 444. FOUNDATIONS OF PIANO PEDAGOGY. (3 Credits)
Introduction to foundational principles of piano instruction and addresses topics surrounding methodology, materials, and the techniques of teaching piano.
This course is repeatable for 6 credits.

MUS 445. PIANO PEDAGOGY I: BEGINNING AND ELEMENTARY STUDENTS. (3 Credits)
Introduces basic foundational ideas of piano instruction at the beginning and elementary levels. Students will engage with topics surrounding methodology, materials, and the techniques of teaching piano to the beginning and elementary student.

MUS 446. PIANO PEDAGOGY II. (3 Credits)
The second in a three-term sequence. The course reinforces foundational ideas and skills learned in Pedagogy I, and continues on to address methodology, materials, and techniques surrounding group piano teaching, teaching preschoolers, and teaching adults. Students will engage in supervised teaching experiences in class as well as in a corresponding lab practicum course which should be taken in conjunction with Pedagogy II. Students must also register for MUS 409.
Prerequisites: MUS 445 with D- or better
Corequisites: MUS 409

MUS 447. PIANO PEDAGOGY III. (3 Credits)
The third in a three-term sequence. The course reinforces foundational ideas learned in Pedagogy I and Pedagogy II, and continues with emphasis on special topics and projects preparing students for a professional career as independent piano teachers. Students must also register for MUS 409.
Prerequisites: MUS 446 with D- or better
Corequisites: MUS 409

MUS 451. INTRODUCTION TO ARTS ENTREPRENEURSHIP. (3 Credits)
Survey of the business strategies behind a successful career in the arts. Emphasizes the importance of entrepreneurial thinking, engages students with the fundamentals of the arts ‘business’, and explores ways to influence and shape the industry’s future. CROSSTO LISTED as ART 451/ MUS 451/TA 451. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Equivalent to: ART 451, TA 451

MUS 472. ITALIAN AND LATIN DICTION FOR SINGERS. (2 Credits)
Presents the principles of lyric diction in Italian and liturgical Latin and provides practice in the skills needed to sing the languages accurately and expressively.
MUS 481. PIANO LITERATURE I: 18TH THROUGH EARLY 19TH CENTURIES. (3 Credits)
Examines the evolution of piano literature from the Baroque period through the early 19th Century. Examines individual styles and composers' works in the context of the surrounding cultural and social history, beginning with the birth of the piano and continuing with the piano's growing popularity in Western European society. An emphasis will be placed on listening experience and the aural identification of landmark piano works. Students to gain familiarity with a rich body of piano repertoire in the historical and social context in which it was composed.

MUS 482. PIANO LITERATURE II: 19TH AND 20TH CENTURIES. (3 Credits)
Examines the evolution of piano literature in the 19th and 20th centuries. Students will learn about individual styles and composers' works in the context of the surrounding cultural and social history of the piano. An emphasis will be placed on listening experience and the aural identification of landmark piano works. The overall objective of the course is for students to gain familiarity with a rich body of piano repertoire in the historical and social context in which it was composed.

MUS 485. PIANO LITERATURE III: REPERTOIRE FOR TEACHING THE PIANO. (3 Credits)
This specialized area of Piano Pedagogy includes repertoire for piano students of varying levels, analytical skills for evaluating repertoire for students, and repertoire requirements for national and international piano teaching organizations.

MUS 493. BASIC RECORDING TECHNIQUES. (3 Credits)
The first of a three-term sequence on analog and digital recording and editing techniques. The first term deals with issues such as signal processing, microphone design and placement, and an introduction to Digidesign Pro-Tools.
Recommended: MUS 123

MUS 494. INTERMEDIATE RECORDING TECHNIQUES. (3 Credits)
The second of a three-term sequence on analog and digital recording and editing techniques. The second term deals with multi-track recording, MIDI interfacing and recording, advanced microphone placement, intermediate Pro-tools, and an introduction to E-magic Logic.
Recommended: MUS 493

MUS 495. ADVANCED RECORDING TECHNIQUES. (3 Credits)
The third of a three-part sequence on analog and digital recording and editing techniques. The third term deals with advanced multi-track recording, sampling MIDI interfacing and recording, mixing and mastering using Waveburner, advanced Pro-Tools, advanced use of E-magic Logic recording and editing and portable ADAT recording and editing.
Recommended: MUS 494

MUS 496. SURROUND SOUND RECORDING AND MASTERING. (2 Credits)
Survey of the concepts, equipment, and standard procedures used in surround sound audio and audio-for-video, including basic equipment and software configuration, surround recording and editing techniques, advanced automation using Pro Tools, and layback/sync to video.
Prerequisites: MUS 495 with D- or better

MUS 499. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 18 credits.

MUS 501. RESEARCH AND SCHOLARSHIP. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 503. THESIS. (1-6 Credits)
This course is repeatable for 999 credits.

MUS 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 506. PROJECTS. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 507. SEMINAR. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 508. WORKSHOP. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 510. INTERNSHIP. (3 Credits)
Provides experience in field settings, opportunity to develop personal and professional skills. See school for details.
This course is repeatable for 12 credits.

MUS 516. ADVANCED CONDUCTING: CHORAL. (3 Credits)
Baton technique, interpretation and the study of major choral scores.
Recommended: MUS 317

MUS 517. ADVANCED CONDUCTING: CHORAL. (3 Credits)
Baton technique, interpretation and the study of major choral scores.
Recommended: MUS 317

MUS 518. ADVANCED CONDUCTING: INSTRUMENTAL. (3 Credits)
Baton technique, interpretation and the study of major instrumental scores.
Recommended: MUS 319

MUS 519. ADVANCED CONDUCTING: INSTRUMENTAL. (3 Credits)
Baton technique, interpretation and the study of major instrumental scores.
Recommended: MUS 319

MUS 540. OSU CHAMBER CHOIR. (1-2 Credits)
A select ensemble of approximately 40 mixed voices. Performance each term. Annual tours. 500-level credit available only to students who can demonstrate proficiency and experience to perform at the graduate level. This will be evaluated by the instructor through audition.
This course is repeatable for 6 credits.

MUS 543. THEORY AND COMPOSITION STUDIES. (3 Credits)
Intensive study of selected subjects, such as analysis, composition, choral arranging, band arranging, and orchestration.
This course is repeatable for 18 credits.

MUS 546. WOMEN'S CHOIR. (1-2 Credits)
A women's ensemble designed for vocal development and exploration of treble choral literature. Performances each term.
This course is repeatable for 9 credits.

MUS 547. MEN'S CHOIR. (1-2 Credits)
A men's ensemble designed for vocal development and exploration of TTBB choral literature. Performances each term.
This course is repeatable for 9 credits.

MUS 550. SYMPHONIC BAND. (1 Credit)
A select ensemble of approximately 80 wind and percussion players. Performance winter and spring terms. 500-level credit available only to students who can demonstrate proficiency and experience sufficient to perform at the graduate level. This will be evaluated by the instructor by audition.
This course is repeatable for 6 credits.
MUS 560. UNIVERSITY SYMPHONY ORCHESTRA. (1 Credit)
An ensemble of 65-80 players. Performance of orchestral repertoire from the 18th, 19th, and 20th centuries. Performance each term. 500-level credit available only to students who can demonstrate proficiency and experience to perform at the graduate level. This will be evaluated by the instructor through audition.
This course is repeatable for 6 credits.

MUS 563. ACCOMPANYING. (1 Credit)
Piano accompanying and chamber music skills, studio experience and weekly performance class. 500-level credit available only to students who can demonstrate proficiency and experience sufficient to perform at the graduate level. This will be evaluated by the instructor by audition.
This course is repeatable for 6 credits.
Recommended: Concurrent enrollment in MUP 590

MUS 572. ITALIAN AND LATIN DICTION FOR SINGERS. (2 Credits)
Prerequisites:
Equivalent to:
This course is repeatable for 6 credits.

MUS 573. GERMAN DICTION FOR SINGERS. (2 Credits)
Prerequisites:
Equivalent to:
This course is repeatable for 6 credits.

MUS 599. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 6 credits.

New Media Communications

NMC 101. *NEW MEDIA AND CULTURE. (3 Credits)
Provides students with the basic critical skills to analyze the cultural, social, and political impact of new media technologies, new media texts, and new media institutions. Students will be exposed to a variety of social scientific and humanistic conceptual approaches to analyzing new media and culture. Special emphasis will be placed on historical analyses of how new media have shaped culture, as well as how culture has shaped new media. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

NMC 101. *INTRODUCTION TO NEW MEDIA COMMUNICATIONS. (3 Credits)
Prerequisites:
This course is repeatable for 16 credits.

NMC 183. INTRODUCTION TO MEDIA PRODUCTION. (3 Credits)
Provides core competency in media production: an introduction to audio and video production, and the elements of the media production and post-production processes.

NMC 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 240. SURVEY OF SOCIAL MEDIA. (3 Credits)
Social media are curiously positioned as being both emergent media and convergent media–they function because of the coalescence of existing media forms and the creation of new ones. This class will use multiple perspectives to explore the past, present, and future of social media.
Prerequisites: NMC 101 with C- or better

NMC 241. APPLIED MEDIA AESTHETICS. (4 Credits)
Principles of visual composition, sequential imagery, interactive design, narrative structure, and cinematic language as they relate to digital communication arts and visualization. Provides core competencies in introductory digital communication arts tools.
Prerequisites: NMC 101 with C- or better

NMC 245. CULTURAL ANALYTICS AND DATA SCIENCE. (3 Credits)
Computational approaches to cultural research have changed what it means to work with media today. This course provides a foundation in data science tailored for work in social and cultural research including basic work in natural language processing, social network analysis, and information visualization.

NMC 255. INTRODUCTION TO SOUND DESIGN. (4 Credits)
The principals and practices of sound design for motion pictures, television and radio. Through reading, viewing, listening and discussion, students will learn the art and science of sound design. Topics include the soundtrack and film narrative–basic terms and concepts; narrative, psychological and emotive functions of sound design; components of the soundtrack–dialogue, music and sound effects; sound design process–recording, editing, mixing and exhibition.
Prerequisites: NMC 101 with C- or better

NMC 260. NEW MEDIA FUTURES. (3 Credits)
Historical context and current perspectives on the various aspects of new multimedia communications, including linear and nonlinear or time-based and interactive media. Primary topics include digital cinema (compositing and nonlinear access), visual music, information visualization, interactive narrative, and virtual space.
Prerequisites: NMC 101 with C- or better

NMC 279. MEDIA LITERACY. (3 Credits)
From the days of cave paintings to our current digital world, we have told stories and created mythologies that guided our collective, daily actions. Using a critical approach, we will analyze and interpret different media to shed light on the underlying structure that shapes our understandings of gender, ethnicity, the self, and our everyday practices as citizens and media consumers.

NMC 280. GLOBAL MEDIA. (3 Credits)
Explores theoretical and practical concepts of global media. Both historical and contemporary perspectives on the topic are addressed, particularly as they relate to cultural autonomy, political rights, social justice, communication flow debates, media systems of different world regions, global representations in U.S. media, and developments in global technology and economic media developments.

NMC 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 301. *WRITING FOR THE MEDIA PROFESSIONAL. (3 Credits)
Fundamentals of gathering information, evaluating information, writing information of the media and editing media content in written form. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: NMC 101

NMC 302. REPORTING. (3 Credits)
An introduction to the practices, procedures, techniques, and organizational structures of basic news gathering and writing.
Equivalent to: WR 301
Recommended: WR 201

NMC 305. COPYEDITING. (3 Credits)
Copyreading, headline writing, newspaper layout and design.
Equivalent to: WR 305

NMC 306. ART AND CULTURE CONTENT CREATION. (3 Credits)
Explores various forms of the arts and culture using criticism/reviewing/feature writing’s forms, principles and ethics. Encourages students to be artful in response, given certain time and space boundaries, but also to discuss pushing the boundaries, exploding those boundaries and doing excellent, artful creation in response to the arts that affect our lives.
NMC 311. INTRODUCTION TO NONPROFIT MANAGEMENT. (3 Credits)
Introduction to the principles of effective nonprofit management and lays a foundation for future leaders and managers in the nonprofit sector. Focuses on historical perspectives, ethics, governance and leadership, legal structure and standards, financial management, strategic planning principles, fundraising principles, volunteer management, marketing and communications, and the future of the nonprofit sector.
Prerequisites: NMC 101 with C- or better and NMC 260 [C-]
Recommended: NMC 301 with C- or better

NMC 320. HISTORY OF TELECOMMUNICATIONS. (3 Credits)
A historical overview of the telecommunications industry. The goal is to understand how the industry got where it is today and, by analyzing principles, events, and trends, suggest what directions it may take in the future. The emphasis is on constructing a causal chronology, interrelating developments in technology, organization, and structure of the industry. This course will focus on the technological developments in the industry.
**Prerequisites:** NMC 101 with C- or better and NMC 260 [C-]
**Recommended:** WR II completed with a passing grade.

NMC 321. HISTORY OF BROADCASTING. (3 Credits)
The technological, economic and corporate, legal and political, artistic, and social developments that shaped American broadcasting in the 20th century are examined. Implications for the future of broadcasting are addressed as well.
**Prerequisites:** NMC 260 with C- or better
**Recommended:** WR II completed with a passing grade.

NMC 322. LANDMARKS IN MEDIA CONTENT. (3 Credits)
Introduces students to media content that represents advances in the art and science of creative use of media technology. Some of these advances were recognized immediately, some only after time had passed.
**Prerequisites:** NMC 101 with C- or better and NMC 260 [C-]
**Recommended:** WR II completed with a passing grade.

NMC 330. THE MEANING OF VIDEO GAMES. (3 Credits)
Examines approaches to understanding the experience of playing video games, including the role of storytelling in diverse games, the relationship between the player and the game, the game as art, and intersections between games and real life.
**Prerequisites:** NMC 301 with C- or better
**Recommended:** NMC 101

NMC 340. SOCIAL MEDIA STRATEGY. (3 Credits)
Designing systems of interaction is important for understanding how people come to be a part of social networks. Students will participate in a series of simulation games that will explore the dimensions of the interaction between publics and social networks, culminating in an original research project.
**Prerequisites:** NMC 240 with C- or better and NMC 260 [C-]
**Recommended:** NMC 301

NMC 341. MEDIA SPIN AND DECEPTION DETECTION. (3 Credits)
Examines common ways media is used to deceive, and how media scholars and creators can avoid falling prey to spinners, platformed prevaricators, and purveyors of 'fake news' using knowledge of production techniques, logic, and other skills.
**Prerequisites:** NMC 101 with C- or better and NMC 260 (may be taken concurrently) [C-]

NMC 349. VIDEO ART. (4 Credits)
Studio course in video art and time-based media projects. Emphasis on experimental approaches to video art in a contemporary art context, linear and non-linear video production and the projection and screening of video art projects. Introduction to the history of video art as an art form.
Lec/studio. CROSSLISTED as ART 349/NMC 349.
**Prerequisites:** ART 222 with C- or better and ART 263 [C-]
**Equivalent to:** ART 349
This course is repeatable for 8 credits.

NMC 351. NEW MEDIA VISUALIZATION. (4 Credits)
Principles of spatial design, interactive design and immersive storytelling as they relate to Virtual, Augmented and Mixed Reality (collectively referred to as Extended or X-Reality). Additional topics include the history and current applications of X-Reality technology.
**Prerequisites:** NMC 101 with C- or better

NMC 355. APPLIED SOUND DESIGN. (4 Credits)
Technical and theoretical application of placing sound in relation to moving image. Concepts and terminology will focus on the physical anatomy of sound and how manipulation changes the perception of sound. Topics include recording environments and monitoring sound; dialogue, voice over and ADR; sound effects and Foley art; and music underscoring.
**Prerequisites:** NMC 255 with C- or better and NMC 260 [C-]

NMC 356. PODCAST PRODUCTION. (3 Credits)
An intermediate-level production class in which we will develop, launch, distribute, and maintain professional-quality podcasts and use podcasting tools and resources for other storytelling enterprises.
**Prerequisites:** NMC 255 with C- or better
**Corequisites:** NMC 260

NMC 380. PRE-PRODUCTION. (4 Credits)
Focuses on pre-production or the planning phase of multimedia production, which includes concept development, scriptwriting, storyboard, budgeting, and talent/location scouting. Class projects emphasize brainstorming, story concept/structure, conceptual art, storyboards, animatics, and interactive design. Class examines narrative structure and the languages of graphic design, cinema, and interactive story.
Lec/studio.
**Prerequisites:** NMC 260 with C- or better

NMC 382. STUDIO AND MULTICAMERA PRODUCTION. (4 Credits)
Proficiency in organizing, producing, directing, and evaluating television sound. Topics include recording environments and monitoring sound; dialogue, voice over and ADR; sound effects and Foley art; and music underscoring.
**Prerequisites:** NMC 380 with C- or better

NMC 383. FIELD PRODUCTION. (4 Credits)
Development of the technical abilities and conceptual approaches to audio, film, video and multimedia production. Emphasis on single-camera production techniques and concepts. Students will begin the study of post-production process. Students will also begin to study lighting and audio as they relate to single-camera field production.
**Prerequisites:** NMC 380 with C- or better
**Recommended:** NMC 351
NMC 385. FOUNDATIONS IN MOTION DESIGN. (4 Credits)
Explores theoretical and applied processes in foundational motion design. Through the creation of assets, applied visual styles and animated compositions students investigate the impact of motion in digital storytelling. Applied principles of motion include timing, rhythm, pace, exaggeration, anticipation and balance through stop motion, rotoscope and key frame animation techniques.
Prerequisites: NMC 101 with C- or better and NMC 241 [C-] and NMC 260 [C-] and NMC 380 [C-]

NMC 388. SOCIAL MEDIA AND INTERPERSONAL RELATIONSHIPS. (3 Credits)
Examines how individuals build and maintain close relationships through new media and social networks. Currently, scholars are seeing a shift in how individuals self-report building close relationships, as people use elements of new media more and more frequently. Designed to look into the similarities and differences of these relationships as compared to face-to-face relationships. CROSSLISTED as COMM 388/NMC 388.
Equivalent to: COMM 388

NMC 392. WEB DESIGN AND PROGRAMMING. (3 Credits)
Web apps are applications that are loaded as web pages. They can store data locally and continue to function while offline. In this hands-on class, students will create web apps that run on smart phones. No prior programming skills are required. Programming concepts that are required to create interactive web apps will be covered in this class.
Prerequisites: NMC 260 with C- or better

NMC 393. SERVER SIDE PROGRAMMING. (3 Credits)
Create websites that focus on the server side. Severe side website can store or retrieve data from users. In this hands-on class, students will create server side websites. No prior programming skills are required. Programming concepts that are required to create interactive server side websites will be covered in this class.
Prerequisites: NMC 260 with C- or better
This course is repeatable for 3 credits.
Recommended: NMC 392

NMC 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 403. THESIS/DISSERTATION. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 404. WRITING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 409. PRACTICUM. (1-16 Credits)
Equivalent to: ART 409
This course is repeatable for 16 credits.

NMC 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 418. VIRAL CONTENT. (3 Credits)
Online media is often filled with memes, likes, shares, tweets and even hilarious cat videos. Companies like Buzzfeed exist to create, maintain and drive traffic to content. In 2015, collectively the top 10 YouTube content creators made 70.5 million dollars. So, what’s the secret to going viral? This class is designed to look at this question by examining the culture of viral content, the social and psychological influences that shape online behavior and the business of creating and spreading viral content. Throughout the term, students will apply these principle concepts in an attempt to make their own viral content.

NMC 419. REEFER MADNESS IN THE MEDIA. (3 Credits)
Critically examines the history of hemp and marijuana prohibition, issues of propaganda and the media's role during the transition between prohibition and the current state of reform. The purpose of this course is to better understand the role media plays in shaping our political, cultural and personal experiences. For students, this knowledge is invaluable for analysis, evaluation and critical thinking skills. The framework of this class is based on four modules: 'History of Marijuana Prohibition', 'Marijuana, Media and Culture', 'Medicinal Marijuana Movement' and 'Legalizing Marijuana Campaigns'.

NMC 421. DIFFUSION OF INNOVATIONS. (3 Credits)
An introduction to old and emerging theories that explain the spread of innovative ideas and technologies among members of a society, emphasizing the role of communication processes and the special problems for diffusion in communication technology.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 425. LATINOS IN THE MEDIA. (3 Credits)
Examines the sociohistorical context for the underrepresentation of Latinos in mainstream media, the narrow roles and issues ascribed to Latinos and the ways in which media moguls attempt to attract Latino consumers. Focus on Latino filmmakers, actors, and writers as they rewrite traditional scripts to create a vibrant, multifaceted picture of Latinos in the U.S. today.
Prerequisites: NMC 101 with D- or better

NMC 427. DIGITAL PORNOGRAPHY. (3 Credits)
Exploration of the prominent role pornography plays in digital communication innovation globally including the examination of social consequences; diffusion of technology, business models and economic impact; legal, ethical, and moral issues; and community health and well-being. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

NMC 430. MEDIA THEORY. (3 Credits)
Specifies the concepts, hypotheses, and theoretical paradigms that have characterized the study of media since the early 20th century. The evolution of theory as new media has changed the media economy is emphasized, as well as the need for new concepts to describe phenomena unique to the Internet era (concepts such as .
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 433. NEW MEDIA STORY TELLING. (3 Credits)
Students will study and develop storytelling methods using new media communications technology. Storytelling will focus on telling stories using non-linear, interactive, multidimensional, multi-sensory, multimedia techniques.
Recommended: NMC 101
NMC 435. MEDIA EFFECTS. (3 Credits)
Reviews the potential for media technology and media content to influence the beliefs and behaviors of individuals. The media's ability to bring about specific changes in people's attitudes, values, political agendas, purchasing habits, and jury decisions are discussed. The impact of new media's interactive technology and content on people's beliefs and behaviors is emphasized.
Prerequisites: NMC 301 with C- or better

NMC 437. NEW MEDIA AND SOCIETY. (3 Credits)
Traces the impact of new media—from the telegraph to the Internet—on American society. Emphasizes the way that existing social institutions (e.g., schools and churches) and opinion leaders (e.g., presidents and scholars) greeted the arrival of new media with an increasingly predictable mixture of fear and euphoria. Social changes such as the westward expansion of the U.S. in the 19th century, the arrival of immigrants in the late 19th and early 20th centuries, and the rise of youth culture in the mid-20th century are discussed in terms of their connection to developments in the technology and structure of media. The integration of Internet-based services into contemporary American society is the focus of one-half of the course.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 440. MEDIA MANAGEMENT. (3 Credits)
Principles of management and their application to new media. The practice of new media management including personnel, programming, sales and promotions. Students will gain an understanding of the business side of the media industries. Students will also develop the analytical methods and problem solving techniques used in the management decision-making process as they relate to the mass media. Students will study the media of radio, broadcast television, cable television, DBS, MMDS, SMATV, satellite, telephony, Internet, film, the recording industry, advertising and public relations, as well as emerging media businesses.
Prerequisites: NMC 301 with C- or better

NMC 441. MEDIA ENTREPRENEURSHIP. (3 Credits)
Studies the entrepreneurial process as it relates uniquely to the arts and sciences of new media. Students will study the basic entrepreneurial processes of law, finance, accounting, organizational structure, budgeting, business plans, market analyses, taxes, licensing, and insurance as they relate to new media enterprises. Students will also study the sales/revenue generation side of new media ventures.
Prerequisites: NMC 301 with C- or better

NMC 461. TRANS-MEDIA PUBLISHING I: CREATING IP. (4 Credits)
Students develop an exploitable intellectual-property storyworld suitable for trans-media franchise development, and anchor it with a genre-fiction novelette of at least 10,000 words.
Prerequisites: NMC 260 with C- or better and NMC 301 [C-]

NMC 462. TRANS-MEDIA PUBLISHING II: EXPLOITING IP. (3 Credits)
Students exploit intellectual-property story franchises (usually developed in NMC 461) into trans-media suites of storytelling assets, choosing from among various media such as video, e-book, audiobook, podcasting, boardgames, iOS apps.
Prerequisites: NMC 260 with C- or better and NMC 301 [C-]

NMC 470. MEDIA LAW. (3 Credits)
The relevant laws and regulations that govern the mass media; the participants in the law making process; the analytical methods and problem solving techniques used in the law making process; the laws and policies affecting journalists. Issues such as libel, privacy, obscenity, indecency, fair trail/free press and copyright are covered.
Prerequisites: NMC 301 with C- or better

NMC 471. TELECOMMUNICATIONS POLICY. (3 Credits)
Covers past and present telecommunications policy. Examines the agencies that govern the telecommunications industry, including the Federal Communications Commission. Studies the differences and similarities between the regulations associated with public and private telecommunications systems and services. Students will gain knowledge of telecommunications industry ownership regulations, including antitrust regulation of the telecommunications industry.
Prerequisites: NMC 301 with C- or better

NMC 481. COMPOSITING AND DIGITAL EFFECTS. (4 Credits)
Explores compositing and digital effects as production techniques in digital storytelling. This course explores several compositing techniques and workflow options for digital manipulation of moving image content. Topics include green screen extraction, motion and camera tracking, rotoscoping, and 2D/3D workflows.
Prerequisites: NMC 101 with C- or better and NMC 241 [C-] and NMC 260 [C-] and NMC 380 [C-]

NMC 482. DOCUMENTARY. (4 Credits)
Theory and production of the documentary genre. The class covers all stages of producing a documentary film from the idea through development, marketing, planning, shooting, editing, and post-production. Lec/lab.
Prerequisites: NMC 383 with C- or better
Recommended: NMC 351 and NMC 380

NMC 483. NEW MEDIA 3-D. (4 Credits)
Hands-on introduction to the world of 3-D computer modeling and animation, including investigations of light, texture, form, spatial design and motion. Course includes discussions of professional and artistic practice and critique of student and professional work. Lec/lab.
Equivalent to: NMC 485

NMC 484. NEW MEDIA ANIMATION. (4 Credits)
An in-depth theoretical and hands-on investigation of advanced animation tools and techniques used for educational, scientific, entertainment, and expressive communication projects. Tools and techniques covered include motion capture (full body, face, hand), automated lip-sync dialogue processing, dynamic simulation, particle motion, and other simulation or performance-based animation approaches. Students will work individually and in teams to explore the communicative and creative possibilities of the described technologies.
Recommended: NMC 101

NMC 487. VIRTUAL MEDIA. (4 Credits)
Explores the topics of interactivity in virtual space from conceptual, historical, theoretical, and practical perspectives. The course will compare and contrast real world physical space with virtual space in an attempt to create a virtual world designed with an audience in mind. Color, light, form, motion, and sound will all be examined and applied throughout this course. Lec/lab.
Prerequisites: NMC 101 with C or better and NMC 483 (may be taken concurrently) [C]
NMC 490. MEDIA ETHICS. (3 Credits)
Exploration of the ethical issues surrounding new media communications. Topics include professionalism in journalism, new media visual production, new media management, advertising, film, and public relations. Topics also include new media's relationship with society, violence in the media, and sex in the media.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 493. MEDIA AND POWER. (3 Credits)
Exposes students to the relationship between media and power. From papyrus and the pencil to the printing press, the telegraph, and GPS, media technologies have been central to the analysis and governance of populations. Special attention will be paid to how media technologies have allowed for the exertion, extension, and resistance of power.
Prerequisites: NMC 301 with C or better

NMC 498. ADVANCED COLLABORATIVE EXPERIENCE. (3-4 Credits)
Senior-level course designed to integrate the skills and knowledge obtained through NMC course work into a group research, group project, and/or group production that will be useful to students for their professional portfolio or serve as the basis for academic publication. Topic changes per term.
Prerequisites: NMC 101 with C- or better and NMC 301 [C-]
This course is repeatable for 4 credits.

NMC 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Theater Arts

TA 121. ORAL INTERPRETATION I. (3 Credits)
Analysis and presentation of literature. Exploration of emotional reactions, expressive vocal and physical responses, and performing techniques for effective communication. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core

TA 144. PLAYREADING. (1 Credit)
Reading/discussion/examination of plays from world theatre of past and present from the perspective of production and theatre history.
This course is repeatable for 2 credits.

TA 147. *INTRODUCTION TO THE THEATRE. (3 Credits)
Origins, history, nature, elements, and style of theatre production; function of artists and craftspeople of the theatre. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core
Equivalent to: TA 147H

TA 147H. *INTRODUCTION TO THE THEATRE. (3 Credits)
Origins, history, nature, elements, and style of theatre production; function of artists and craftspeople of the theatre. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: TA 147

TA 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 242. VISUAL PRINCIPLES OF THEATRE. (3 Credits)
An introduction to visual creativity, creative thinking, and visual problem solving as applied to theatre arts as a whole, and to scene and costume design. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core

TA 243. PRINCIPLES OF COSTUMING FOR THE STAGE. (3 Credits)
Principles and techniques of costume construction; practical application in the costume shop on theatre production.
Recommended: TA 147 and TA 242

TA 244. SCENE CRAFTS. (3 Credits)
Constructing scenery and stage properties; practical experience in backstage procedures and scene painting. Lec/lab. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core

TA 245. STAGE LIGHTING. (3 Credits)
Fundamentals of electricity as used in stage lighting; color and light, lighting instruments and control systems, theory and practice of lighting stage production.
Recommended: TA 244

TA 247. STAGE MAKEUP. (3 Credits)
Basic principles and theory with laboratory experience in most-used applications of theatrical makeup.

TA 248. FUNDAMENTALS OF ACTING I. (3 Credits)
Examination of basic principles and techniques of acting. Exploration of relaxation/focus, personal vocal/physical awareness, the actor's craft, and the performance process. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Recommended: TA 147

TA 249. FUNDAMENTALS OF ACTING II. (3 Credits)
Continued work in the basic principles and techniques of acting. Emphasis on improvisation, character analysis, and creation, the balance between truth and technique.
Prerequisites: TA 248 with D- or better

TA 250. WORKSHOP: THEATRE ARTS. (1-3 Credits)
Practical experience in performance, technical theatre, or design. Maximum for 6 credits may be applied toward graduation.
Equivalent to: TA 250H
This course is repeatable for 6 credits.

TA 250H. WORKSHOP: THEATRE ARTS. (1-3 Credits)
Practical experience in performance, technical theatre, or design. Maximum for 6 credits may be applied toward graduation.
Attributes: HNRS – Honors Course Designator
Equivalent to: TA 250
This course is repeatable for 6 credits.

TA 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 330. *HISTORY OF THE THEATRE. (3 Credits)
The rise and development of the composite arts of the theatre in their cultural and social context. Origins to 1500. Offered alternate years. (H)
(Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core

TA 331. *HISTORY OF THE THEATRE. (3 Credits)
The rise and development of the composite arts of the theatre in their cultural and social context. 1500 to 1870. Offered alternate years. (H)
(Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Recommended: TA 144 and TA 147
TA 332. **HISTORY OF THE THEATRE. (3 Credits)**
The rise and development of the composite arts of the theatre in their cultural and social context. 1870 to present. Offered alternate years. (H) (Bacc Core Course) (Writing Intensive Course)
**Attributes:** CPLA – Core, Pers, Lit and Arts; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
**Recommended:** TA 144 and TA 147

TA 344. **PLAYSCRIPT ANALYSIS. (3 Credits)**
Study of major approaches to playscript analysis and detailed application of these systems to the theatrical production process. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
**Prerequisites:** TA 147 with D- or better
**Recommended:** TA 144

TA 346. **SCENE AND STAGE DESIGN. (3 Credits)**
Designs for stage productions including elements of color, mass, line, and lighting for various types of theatre architecture and plays. Offered alternate years.
**Recommended:** TA 147 and TA 244

TA 348. **ADVANCED ACTING: REALISM. (3 Credits)**
Discussion, research, rehearsal, performance, and criticism of scenes from realistic drama. Emphasis on the craft of acting, emotional availability/honesty, personal awareness. Offered alternate years.
**Prerequisites:** TA 248 with D- or better

TA 349. **ADVANCED ACTING: STYLES. (3 Credits)**
Discussion, research, rehearsal, performance, and criticism of scenes from a range of period and genre styles. Offered alternate years.
**Prerequisites:** TA 248 with D- or better

TA 350. **WORKSHOP THEATRE ARTS. (1-3 Credits)**
Advanced work in acting, directing or technical theatre in dramatic productions; laboratory experience. Maximum of 6 credits may be applied toward graduation.
This course is repeatable for 6 credits.

TA 351. **PRINCIPLES OF PLAYWRITING. (3 Credits)**
Basic principles and techniques of playwriting. Offered alternate years.
**Recommended:** TA 144 and TA 344

TA 352. **PLAYWRITING WORKSHOP. (3 Credits)**
Intensive work on student playscripts generated in TA 351, through revisions and rehearsals. Offered alternate years.
**Recommended:** TA 351

TA 354. **FUNDS PLAY DIRECTION. (3 Credits)**
Lectures and explorations of theories, issues, methods, problems, and applications in theatre arts. Concentrated work in a variety of selected theatre topics. Offered as demand and staffing allow.
**Equivalent to:** TA 360H
This course is repeatable for 12 credits.
**Recommended:** 9 credits of theatre arts

TA 360. **MULTICULTURAL AMERICAN THEATRE. (3 Credits)**
Examines the rich panorama of multicultural-American theatre (e.g., African-American, gay and lesbian, Hispanic, Asian American). (H) (Bacc Core Course)
**Attributes:** CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
**Equivalent to:** TA 360H
This course is repeatable for 12 credits.
**Recommended:** 9 credits of theatre arts

TA 360H. **MULTICULTURAL AMERICAN THEATRE. (3 Credits)**
Examines the rich panorama of multicultural-American theatre (e.g., African-American, gay and lesbian, Hispanic, Asian American). (H) (Bacc Core Course)
**Attributes:** CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
**Equivalent to:** TA 360
This course is repeatable for 16 credits.

TA 399. **SPECIAL TOPICS. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 401. **RESEARCH. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 402. **INDEPENDENT STUDY. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 403. **THESIS. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 405. **READING AND CONFERENCE. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 406. **PROJECTS. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 407. **SEMINAR. (1-16 Credits)**
**Equivalent to:** TA 407H
This course is repeatable for 16 credits.

TA 407H. **SEMINAR. (1-16 Credits)**
**Attributes:** HNRS – Honors Course Designator
**Equivalent to:** TA 407
This course is repeatable for 16 credits.

TA 408. **WORKSHOP. (1-16 Credits)**
This course is repeatable for 16 credits.

TA 410. **THEATRE ARTS INTERNSHIP. (1-16 Credits)**
One- to three-term residency in a producing theatre, for a maximum allowable total of 15 credits. Student works in a department of the theatre and in related production activities, according to areas of interest or specialization. Work supervised and evaluated by agency staff; academic evaluation by supervising department faculty member(s). Available to upper-division theatre arts majors and graduate students approved by faculty and selected by intern agency.
This course is repeatable for 15 credits.
**Recommended:** 27 credits of theatre arts, with a minimum of 6 credits in area of skill specialization, or 12 credits of upper-division theatre arts courses, with a minimum of 6 credits in area of skill specialization

TA 416. **TOPICS IN THEATRE ARTS. (3 Credits)**
Lectures and explorations of theories, issues, methods, problems, and applications in theatre arts. Concentrated work in a variety of selected theatre topics. Offered as demand and staffing allow.
**Equivalent to:** TA 416H
This course is repeatable for 12 credits.
**Recommended:** 9 credits of theatre arts

TA 416H. **TOPICS IN THEATRE ARTS. (3 Credits)**
Lectures and explorations of theories, issues, methods, problems, and applications in theatre arts. Concentrated work in a variety of selected theatre topics. Offered as demand and staffing allow.
**Attributes:** HNRS – Honors Course Designator
**Equivalent to:** TA 416
This course is repeatable for 12 credits.
TA 443. COSTUME DESIGN. (3 Credits)
Theory and practice of designing costumes for a theatrical production. 
Recommended: TA 243

TA 444. *THEORY AND CRITICISM OF THEATRE ARTS. (3 Credits)
Major theories that have influenced and motivated theatre practice in 
Western civilization throughout its development. Offered on alternate 
years. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: TA 444H
Recommended: 6 credits of theatre history, or 6 credits of dramatic 
literature.

TA 450. STUDIO: THEATRE ARTS. (3-6 Credits)
Advanced individual study on approved projects in one of the arts of the 
theatre: acting, directing or scene/costume/lighting design; or in stage or 
theatrical management.
This course is repeatable for 6 credits.
Recommended: 9 credits of upper-division theatre arts

TA 451. INTRODUCTION TO ARTS ENTREPRENEURSHIP. (3 Credits)
Survey of the business strategies behind a successful career in the 
arts. Emphasizes the importance of entrepreneurial thinking, engages 
students with the fundamentals of the arts 'business', and explores ways 
to influence and shape the industry's future. CROSSLISTED as ART 451/ 
MUS 451/TA 451. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Equivalent to: ART 451, MUS 451

TA 454. ADVANCED PLAY DIRECTION. (3 Credits)
Expanded exploration of directing theories and techniques. Practical 
application through the production of a one-act play in a laboratory 
theatre. Offered alternate years.
Recommended: TA 354 with D- or better

TA 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

TA 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

TA 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

TA 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

TA 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

TA 510. THEATRE ARTS INTERNSHIP. (6-15 Credits)
One- to three-term residency in a producing theatre, for a maximum 
allowable total of 15 credits. Student works in a department of the theatre and in related production activities, according to areas of interest or specialization. Work supervised and evaluated by agency staff; academic evaluation by supervising department faculty member(s). Available to upper-division theatre arts majors and graduate students approved by faculty and selected by intern agency. 
This course is repeatable for 15 credits.
Recommended: 27 credits in theatre arts, with a minimum of 6 credits in area of skill specialization, or 12 credits of upper-division theatre arts courses, with a minimum of 6 credits in area of skill specialization

TA 516. TOPICS IN THEATRE ARTS. (3 Credits)
Lectures and explorations of theories, issues, methods, problems, and 
applications in theatre arts. Concentrated work in a variety of selected 
theatre topics. Offered as demand and staffing allow. 
This course is repeatable for 12 credits.
Recommended: 9 credits of theatre arts

TA 543. COSTUME DESIGN. (3 Credits)
Theory and practice of designing costumes for a theatrical production. 
Recommended: TA 243

TA 550. STUDIO: THEATRE ARTS. (3-6 Credits)
Advanced individual study on approved projects in one of the arts of the 
theatre: acting, directing or scene/costume/lighting design; or in stage or 
theatre management.
This course is repeatable for 6 credits.
Recommended: 9 credits of upper-division theatre arts

TA 554. ADVANCED PLAY DIRECTION. (3 Credits)
Expanded exploration of directing theories and techniques. Practical 
application through the production of a one-act play in a laboratory 
theatre. Offered alternate years.
Recommended: TA 354

Art Graduate Minor

Graduate Areas of Concentration

Art history, fine arts, photography

The School of Arts and Communication offers graduate work leading to the Master of Arts in Interdisciplinary Studies (MAIS) and toward minors in other advanced degree programs. Emphasis may be in fine arts, art history, or photography. These fields offer sufficient depth to provide a strong minor.

Minor Code: 8800

Minor Code: 8800

Art History Minor

Also available at OSU-Cascades.

Minor Code: 881

Art minors may not elect to take required art courses on an S/U graded basis.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 204 &amp; ART 205 &amp; ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES and *INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
<td>9</td>
</tr>
<tr>
<td>ART 208</td>
<td>*INTRODUCTION TO ASIAN ART</td>
<td>3</td>
</tr>
</tbody>
</table>

Upper-division art history courses including at least 3 credits at the 400 level | 15 |
Total Hours | 30 |

* Baccalaureate Core Course (BCC)

Minor Code: 881
Art Undergraduate Major (BA, BFA, BS, HBA, HBFA, HBS)

Also available at OSU-Cascades.

We offer three options of study for a BA/BS in Art:

1. Art History
2. Studio Art
3. Photography and Digital Studio

We offer two options of study for a BFA in Art:

1. Studio Art BFA
2. Photography and Digital Studio BFA

The Art program is an interdisciplinary curriculum that enables students to gain a deeper understanding of their own ideas and how they relate to larger historical and cultural contexts. Courses at the 100 level stress fundamental aspects of visual literacy. Courses numbered 200 through 499 offer increasingly intensive study in art history, painting, printmaking, photography, digital studio, sculpture, expanded media, and drawing.

Major Code: 880

Art majors may not take required art courses on an S/U graded basis.

The Art Major core curriculum courses must be completed before taking upper-division studio courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baccalaureate Core</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select 51 credits</td>
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</tr>
<tr>
<td></td>
<td>Art Major Core</td>
<td></td>
</tr>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>Total credits required for graduation</td>
<td>180</td>
<td></td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 880

Art History Option

This option is offered within the following major(s):

• Art - College of Liberal Arts (p. 622)

Option Code: 881

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Division</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Art Major Core</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Lower-Division Art History Requirements</td>
<td></td>
</tr>
<tr>
<td>ART 204</td>
<td>*INTRODUCTION TO WESTERN ARE PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td>3</td>
</tr>
<tr>
<td>ART 205</td>
<td>*INTRODUCTION TO WESTERN ARE GOTHIC TO BAROQUE</td>
<td>3</td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ARE NEOCLASSICISM TO CONTEMPORARY</td>
<td>3</td>
</tr>
<tr>
<td>ART 208</td>
<td>*INTRODUCTION TO ASIAN ART</td>
<td>3</td>
</tr>
<tr>
<td>Lower-Division Art Studio Electives</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Art History (400 level)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 411</td>
<td>*ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES</td>
<td>3</td>
</tr>
<tr>
<td>ART 460</td>
<td>HISTORY OF AMERICAN ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 461</td>
<td>HISTORY OF AMERICAN ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 462</td>
<td>DIRECTIONS AND ISSUES IN CONTEMPORARY ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 463</td>
<td>TOPICS IN RENAISSANCE AND BAROQUE ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 464</td>
<td>CULTURAL STUDIES OF THE MUSEUM</td>
<td>3</td>
</tr>
<tr>
<td>ART 465</td>
<td>HISTORY OF PRINTMAKING</td>
<td>3</td>
</tr>
<tr>
<td>ART 469</td>
<td>*METHODS AND THEORY OF ART HISTORY</td>
<td>3</td>
</tr>
<tr>
<td>ART 492</td>
<td>SPECIAL TOPICS IN ASIAN ART</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>113</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 881

Photography and Digital Studio BFA Option

This option is offered within the following major(s):

• Art - College of Liberal Arts (p. 622)

Formerly Photography BFA option (892).

The Photography and Digital Studio BFA option concentrates on digital and traditional photographic processes and approaches to making contemporary art but also on related technological arts such as video, sound, installation, and computer-based arts. The primary objective of offering the BFA is to provide professional education in visual art at the undergraduate level and to enable graduates to enter professional, studio-based careers and within the creative industries.

Art (BFA) majors taking the Photography and Digital Studio BFA option may not take required art courses on an S/U graded basis. Students may not use courses in which they have earned less than a C– to satisfy BFA
requirements. A minimum 3.00 grade-point average must be maintained in all art courses used to meet BFA requirements.

**Option Code: 831**

The core curriculum studio courses must be completed before taking upper-division studio courses for a major program. All students seeking a major or a minor must see a departmental advisor on a yearly basis.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 100</td>
<td>ART ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
</tbody>
</table>

**Lower-Division Art Electives**

- Select one studio art electives at the 200 level: 4
- Select two art history electives at the 200 level: 6

**Photography and Digital Studio BFA Requirements**

**Required Photography and Digital Studio BFA Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 222</td>
<td>INTRODUCTION TO TIME-BASED ART</td>
<td>4</td>
</tr>
<tr>
<td>ART 263</td>
<td>DIGITAL PHOTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>ART 340</td>
<td>DARKROOM PHOTOGRAPHY I</td>
<td>4</td>
</tr>
<tr>
<td>ART 345</td>
<td>INTERMEDIATE PHOTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>ART 347</td>
<td>PHOTOGRAPHY: STUDIO LIGHTING</td>
<td>4</td>
</tr>
<tr>
<td>ART 456</td>
<td>PORTFOLIO-PHOTOGRAPHY/VIDEO ART (To be taken in Winter term in the senior year. Repeatable to 8 credits)</td>
<td>4</td>
</tr>
</tbody>
</table>

**Photography and Digital Studio BFA Electives**

Select eight courses of the following, with at least two at the 400-level: 32

- ART 339 | PROFESSIONAL PRACTICES FOR ARTISTS
- ART 341 | DARKROOM PHOTOGRAPHY II
- ART 346 | PHOTO ILLUSTRATION I
- ART 348 | CONCEPTS IN DIGITAL IMAGING
- ART 349 | VIDEO ART (Repeatable to 8 credits)
  or NMC 349 | VIDEO ART
- ART 350 | PHOTOGRAPHY ON ASSIGNMENT
- ART 354 | ALTERNATIVE PROCESSES IN PHOTOGRAPHY
- ART 359 | *PHOTOGRAPHY: ACTIVISM, AND SOCIAL CHANGE
- ART 409 | PRACTICUM STUDENT MEDIA (Repeatable to 4 credits)
- ART 422 | NEW MEDIA: INTERACTIVE
- ART 432 | *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE
- ART 441 | PHOTOGRAPHY III
- ART 443 | COMBINED MEDIA: PHOTO INSTALLATION
- ART 444 | THE CONSTRUCTED IMAGE
- ART 446 | DOCUMENTARY PHOTOGRAPHY
- ART 447 | ADVANCED STUDIO LIGHTING
- ART 454 | ALTERNATIVE PROCESSES IN PHOTOGRAPHY II
- ART 456 | PORTFOLIO-PHOTOGRAPHY/VIDEO ART (Repeatable to 8 credits)
- NMC 383 | FIELD PRODUCTION

**Required Art History Courses**

- ART 264 | *PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART | 3
- ART 366 | ART SINCE 1945 | 3
- ART 368 | *HISTORY OF PHOTOGRAPHY | 3
  or ART 411 | *ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES
- ART 462 | DIRECTIONS AND ISSUES IN CONTEMPORARY ART | 3

**Additional 300/400 Art electives**

Select 21 credits

---

1. Art electives may be any combination of Art History or Studio Art courses. One class may be at the 200 level. At least two classes must be at the 400 level.

---

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

**Note:** Total Art credits must equal 120 credits

**Option Code: 831**

**Photography and Digital Studio Option**

This option is offered within the following major(s):

- Art - College of Liberal Arts (p. 622)

**Formerly Photography option (884).**

The Photography and Digital Studio option concentrates on digital and traditional photographic processes and approaches as situated in contemporary art but also on related technological arts such as video, sound, installation, and computer-based arts; preparing students for careers in the creative arts.

Art (BA/BS) majors taking the Photography and Digital Studio option may not take required art courses on an S/U graded basis.

**Option Code: 829**

The following studio courses must be completed before taking upper-division studio courses for the major program:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
<td>4</td>
</tr>
</tbody>
</table>

All students seeking a major or a minor must see a departmental advisor on a yearly basis.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART Major Core</td>
<td>Select 10 credits</td>
<td>10</td>
</tr>
</tbody>
</table>

**Required Studio Art Core**

- ART 100 | ART ORIENTATION | 1
- ART 199 | SPECIAL STUDIES (Studio for ART 100) | 1
- ART 117 | 3-D CORE STUDIO | 4
- ART 121 | DIGITAL CORE STUDIO | 4

**Required Photography and Digital Studio Courses**

- ART 222 | INTRODUCTION TO TIME-BASED ART | 4
- ART 263 | DIGITAL PHOTOGRAPHY | 4
- ART 264 | *PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART | 3
- ART 340 | DARKROOM PHOTOGRAPHY I | 4
- ART 345 | INTERMEDIATE PHOTOGRAPHY | 4
- ART 347 | PHOTOGRAPHY: STUDIO LIGHTING | 4
- ART 368 | *HISTORY OF PHOTOGRAPHY | 3
  or ART 411 | *ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES

**Photography and Digital Studio Electives**

Select three of the following, with at least two at the 400-level:

- ART 339 | PROFESSIONAL PRACTICES FOR ARTISTS
- ART 341 | DARKROOM PHOTOGRAPHY II
- ART 346 | PHOTO ILLUSTRATION I
- ART 348 | CONCEPTS IN DIGITAL IMAGING
Studio Art BFA Option

This option is offered within the following major(s):

- Art - College of Liberal Arts (p. 622)

The Studio Art BFA option offers concentrations in painting, drawing, sculpture, installation-arts, printmaking, and expanded media. The primary objective of offering the BFA is to provide professional education in visual art at the undergraduate level and to enable graduates to enter studio-based careers within the creative industries.

Option Code: 830

Art (BFA) majors taking the Studio Art BFA option may not take required art courses on an S/U graded basis. Students may not use courses in which they have earned less than a C– to satisfy BFA requirements. A minimum 3.00 grade-point average must be maintained in all art courses used to meet BFA requirements.

The following core curriculum studio courses must be completed before taking upper-division studio courses for a major program:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 100</td>
<td>ART ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 339</td>
<td>PROFESSIONAL PRACTICES FOR ARTISTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 366</td>
<td>ART SINCE 1945</td>
<td>3</td>
</tr>
<tr>
<td>ART 411</td>
<td>*ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES</td>
<td>3</td>
</tr>
<tr>
<td>ART 462</td>
<td>DIRECTIONS AND ISSUES IN CONTEMPORARY ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 331</td>
<td>DRAWING CONCEPTS</td>
<td></td>
</tr>
<tr>
<td>ART 334</td>
<td>DRAWING III: FIGURE</td>
<td></td>
</tr>
<tr>
<td>ART 340</td>
<td>DARKROOM PHOTOGRAPHY I</td>
<td></td>
</tr>
<tr>
<td>ART 341</td>
<td>DARKROOM PHOTOGRAPHY II</td>
<td></td>
</tr>
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<td>ART 345</td>
<td>INTERMEDIATE PHOTOGRAPHY</td>
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</tr>
<tr>
<td>ART 347</td>
<td>PHOTOGRAPH: STUDIO LIGHTING</td>
<td></td>
</tr>
<tr>
<td>ART 348</td>
<td>CONCEPTS IN DIGITAL IMAGING</td>
<td></td>
</tr>
<tr>
<td>ART 349</td>
<td>VIDEO ART</td>
<td>4</td>
</tr>
<tr>
<td>or NMC 349</td>
<td>VIDEO ART</td>
<td></td>
</tr>
<tr>
<td>ART 516</td>
<td>INSTALLATION</td>
<td></td>
</tr>
<tr>
<td>ART 354</td>
<td>ALTERNATIVE PROCESSES IN PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 375</td>
<td>PRINTMAKING: RELIEF</td>
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<tr>
<td>ART 376</td>
<td>PRINTMAKING: INTAGLIO</td>
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</tr>
<tr>
<td>ART 377</td>
<td>PRINTMAKING: LITHOGRAPHY</td>
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<td>ART 378</td>
<td>PRINTMAKING: MONOTYPE</td>
<td></td>
</tr>
<tr>
<td>ART 379</td>
<td>PRINTMAKING: SCREEN PRINTING</td>
<td></td>
</tr>
<tr>
<td>ART 381</td>
<td>PAINTING II: THE FIGURE</td>
<td></td>
</tr>
<tr>
<td>ART 382</td>
<td>PAINTING II: CONCEPTS</td>
<td></td>
</tr>
<tr>
<td>ART 383</td>
<td>PAINTING II: ABSTRACT AND MULTIMEDIA</td>
<td></td>
</tr>
<tr>
<td>ART 384</td>
<td>PAINTING II: NEW GENRE</td>
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<tr>
<td>ART 387</td>
<td>SCULPTURE II</td>
<td></td>
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</tbody>
</table>

All students seeking a major or a minor must see a departmental advisor on a yearly basis.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Lower Division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART Major Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select 12 credits</td>
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<tr>
<td>Studio Art Care</td>
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<tr>
<td>ART 100</td>
<td>ART ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>ART 199</td>
<td>SPECIAL STUDIES (Studio for ART 100)</td>
<td>1</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
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</table>

Upper-Division Art Electives

Select three of the following art history electives at the 200 level: 12

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 204</td>
<td>*INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td></td>
</tr>
<tr>
<td>ART 205</td>
<td>*INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE</td>
<td></td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
<td></td>
</tr>
<tr>
<td>ART 208</td>
<td>*INTRODUCTION TO ASIAN ART</td>
<td></td>
</tr>
<tr>
<td>ART 210</td>
<td>*HISTORY OF WESTERN ARCHITECTURE</td>
<td></td>
</tr>
<tr>
<td>ART 264</td>
<td>*PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART</td>
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</tr>
</tbody>
</table>

Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 339</td>
<td>PROFESSIONAL PRACTICES FOR ARTISTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 366</td>
<td>ART SINCE 1945</td>
<td>3</td>
</tr>
<tr>
<td>ART 411</td>
<td>*ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES</td>
<td>3</td>
</tr>
<tr>
<td>ART 462</td>
<td>DIRECTIONS AND ISSUES IN CONTEMPORARY ART</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

Select 45 credits of the following with 4 credits at the 200 level and at least 20 credits at the 400 level: 45

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 332</td>
<td>DRAWING CONCEPTS</td>
<td></td>
</tr>
<tr>
<td>ART 334</td>
<td>DRAWING III: FIGURE</td>
<td></td>
</tr>
<tr>
<td>ART 340</td>
<td>DARKROOM PHOTOGRAPHY I</td>
<td></td>
</tr>
<tr>
<td>ART 341</td>
<td>DARKROOM PHOTOGRAPHY II</td>
<td></td>
</tr>
<tr>
<td>ART 345</td>
<td>INTERMEDIATE PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 347</td>
<td>PHOTOGRAPH: STUDIO LIGHTING</td>
<td></td>
</tr>
<tr>
<td>ART 348</td>
<td>CONCEPTS IN DIGITAL IMAGING</td>
<td></td>
</tr>
<tr>
<td>ART 349</td>
<td>VIDEO ART</td>
<td>4</td>
</tr>
<tr>
<td>or NMC 349</td>
<td>VIDEO ART</td>
<td></td>
</tr>
<tr>
<td>ART 351</td>
<td>INSTALLATION</td>
<td></td>
</tr>
<tr>
<td>ART 354</td>
<td>ALTERNATIVE PROCESSES IN PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 375</td>
<td>PRINTMAKING: RELIEF</td>
<td></td>
</tr>
<tr>
<td>ART 376</td>
<td>PRINTMAKING: INTAGLIO</td>
<td></td>
</tr>
<tr>
<td>ART 377</td>
<td>PRINTMAKING: LITHOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 378</td>
<td>PRINTMAKING: MONOTYPE</td>
<td></td>
</tr>
<tr>
<td>ART 379</td>
<td>PRINTMAKING: SCREEN PRINTING</td>
<td></td>
</tr>
<tr>
<td>ART 381</td>
<td>PAINTING II: THE FIGURE</td>
<td></td>
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<tr>
<td>ART 382</td>
<td>PAINTING II: CONCEPTS</td>
<td></td>
</tr>
<tr>
<td>ART 383</td>
<td>PAINTING II: ABSTRACT AND MULTIMEDIA</td>
<td></td>
</tr>
<tr>
<td>ART 384</td>
<td>PAINTING II: NEW GENRE</td>
<td></td>
</tr>
<tr>
<td>ART 391</td>
<td>SCULPTURE II</td>
<td></td>
</tr>
</tbody>
</table>
### Studio Art Option

**This option is offered within the following major(s):**

- Art - College of Liberal Arts (p. 622)

**Also available at OSU-Cascades.**

**Option Code: 828**

Art (BA/BS) majors taking the Studio Art option may not take required art courses on an S/U graded basis.

The following core curriculum studio courses must be completed before taking upper-division studio courses for the major program:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
<td>4</td>
</tr>
</tbody>
</table>

All students seeking a major or a minor must see a departmental advisor on a yearly basis.

**Option Code: 830**

### Code Title Hours

### Lower Division

**Art Major Core**

Select 12 credits

**Required Art Core Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ART 100</td>
<td>ART ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td>ART 199</td>
<td>SPECIAL STUDIES (Studio for ART 100)</td>
<td>1</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
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</table>

### Lower-Division Art Electives

Select three of the following studio art electives at the 200 level:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 215</td>
<td>COLOR IN THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 222</td>
<td>INTRODUCTION TO TIME-BASED ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 234</td>
<td>DRAWING III/FIGURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 263</td>
<td>DIGITAL PHOTOGRAPHY</td>
<td>3</td>
</tr>
<tr>
<td>ART 271</td>
<td>PRINTMAKING I</td>
<td>3</td>
</tr>
<tr>
<td>ART 281</td>
<td>PAINTING I</td>
<td>3</td>
</tr>
<tr>
<td>ART 291</td>
<td>SCULPTURE I</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three of the following art history electives at the 200 level:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 204</td>
<td>*INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES</td>
<td>3</td>
</tr>
<tr>
<td>ART 205</td>
<td>*INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE</td>
<td>3</td>
</tr>
<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
<td>3</td>
</tr>
<tr>
<td>ART 208</td>
<td>*INTRODUCTION TO ASIAN ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 210</td>
<td>*HISTORY OF WESTERN ARCHITECTURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 264</td>
<td>*PHOTOGRAPHY HISTORY; TECHNOLOGY; CULTURE AND ART</td>
<td>3</td>
</tr>
</tbody>
</table>

### Upper-Division

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 366</td>
<td>ART SINCE 1945</td>
<td>3</td>
</tr>
</tbody>
</table>

### Select five of the following 300/400 level studio art electives with at least 8 credits at the 400 level:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 331</td>
<td>DRAWING CONCEPTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 334</td>
<td>DRAWING III/FIGURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 340</td>
<td>DARKROOM PHOTOGRAPHY I</td>
<td>3</td>
</tr>
<tr>
<td>ART 341</td>
<td>DARKROOM PHOTOGRAPHY II</td>
<td>3</td>
</tr>
<tr>
<td>ART 345</td>
<td>INTERMEDIATE PHOTOGRAPHY</td>
<td>3</td>
</tr>
<tr>
<td>ART 347</td>
<td>PHOTOGRAPHY: STUDIO LIGHTING</td>
<td>3</td>
</tr>
<tr>
<td>ART 348</td>
<td>CONCEPTS IN DIGITAL IMAGING</td>
<td>3</td>
</tr>
<tr>
<td>ART 349</td>
<td>VIDEO ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 351</td>
<td>INSTALLATION</td>
<td>3</td>
</tr>
</tbody>
</table>

### Note:
The 400-level studio block may be any combination of painting, printmaking, sculpture, photography, or drawing courses.

### Option Code: 830

**Studio Art Option**

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)

**Any Studio Art, Photography and Digital Studio, or Art History electives 300/400 level**

- Select three of the following art history electives at the 300/400 level with 3 credits at the 200 level and at least one at the 400 level:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 310</td>
<td>*EARLY CHINESE ART AND ARCHAEOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>ART 311</td>
<td>*LATE CHINESE ART AND CULTURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 312</td>
<td>*CONTEMPORARY CHINESE ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 313</td>
<td>*ART OF JAPAN</td>
<td>3</td>
</tr>
<tr>
<td>ART 320</td>
<td>*ANCIENT GREEK ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 321</td>
<td>*ANCIENT ROMAN ART AND ARCHITECTURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 322</td>
<td>*MEDIEVAL ART AND ARCHITECTURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 323</td>
<td>*ITALIAN RENAISSANCE ART AND ARCHITECTURE</td>
<td>3</td>
</tr>
<tr>
<td>ART 364</td>
<td>*NINETEENTH-CENTURY ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 365</td>
<td>*HISTORY OF MODERN ART 1900-1945</td>
<td>3</td>
</tr>
<tr>
<td>ART 366</td>
<td>ART SINCE 1945</td>
<td>3</td>
</tr>
<tr>
<td>ART 367</td>
<td>*HISTORY OF DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>ART 368</td>
<td>*HISTORY OF PHOTOGRAPHY</td>
<td>3</td>
</tr>
<tr>
<td>ART 460</td>
<td>HISTORY OF AMERICAN ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 461</td>
<td>HISTORY OF AMERICAN ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 462</td>
<td>DIRECTIONS AND ISSUES IN CONTEMPORARY ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 463</td>
<td>TOPICS IN RENAISSANCE AND BAROQUE ART</td>
<td>3</td>
</tr>
<tr>
<td>ART 464</td>
<td>CULTURAL STUDIES OF THE MUSEUM</td>
<td>3</td>
</tr>
<tr>
<td>ART 468</td>
<td>HISTORY OF PRINTMAKING</td>
<td>3</td>
</tr>
<tr>
<td>ART 469</td>
<td>*METHODS AND THEORY OF ART HISTORY</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Hours: 121**
ART 383  PAINTING II: ABSTRACT AND MULTIMEDIA
ART 384  PAINTING II: NEW GENRE
ART 391  SCULPTURE II
ART 422  NEW MEDIA: INTERACTIVE
ART 431  DRAWING IV
ART 434  DRAWING IV/Figure
ART 441  PHOTOGRAPHY III
ART 443  COMBINED MEDIA: PHOTO INSTALLATION
ART 444  THE CONSTRUCTED IMAGE
ART 446  DOCUMENTARY PHOTOGRAPHY
ART 447  ADVANCED STUDIO LIGHTING
ART 454  ALTERNATIVE PROCESSES IN PHOTOGRAPHY II
ART 475  PRINTMAKING STUDIO
ART 479  PRINTMAKING: ADVANCED SCREEN PRINTING
ART 481  PAINTING III

Select three of the following art history electives at the 300/400 level with at least one at the 400 level:

ART 310  *EARLY CHINESE ART AND ARCHAEOLOGY
ART 311  *LATE CHINESE ART AND CULTURE
ART 312  *CONTEMPORARY CHINESE ART
ART 313  *ART OF JAPAN
ART 320  *ANCIENT GREEK ART
ART 321  *ANCIENT ROMAN ART AND ARCHITECTURE
ART 322  *MEDIEVAL ART AND ARCHITECTURE
ART 323  *ITALIAN RENAISSANCE ART AND ARCHITECTURE
ART 364  *NINETEENTH-CENTURY ART
ART 365  *HISTORY OF MODERN ART 1900-1945
ART 366  ART SINCE 1945
ART 367  *HISTORY OF DESIGN
ART 368  *HISTORY OF PHOTOGRAPHY
ART 460  HISTORY OF AMERICAN ART
ART 461  HISTORY OF AMERICAN ART
ART 462  DIRECTIONS AND ISSUES IN CONTEMPORARY ART
ART 463  TOPICS IN RENAISSANCE AND BAROQUE ART
ART 464  CULTURAL STUDIES OF THE MUSEUM
ART 468  HISTORY OF PRINTMAKING
ART 469  *METHODS AND THEORY OF ART HISTORY

Total Hours 75

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)

Note: Studio Art electives include studio courses in painting, printmaking, sculpture, drawing, photography and digital studio, or related media.

Option Code: 828

Arts, Media, and Technology Minor

Available only at OSU-Cascades.

The Arts, Media, and Technology program prepares individuals for careers as creative professionals with diverse and adaptable skillsets, ready to address the opportunities and challenges of the 21st century. In addition to traditional art students, this program is designed to attract artists, designers, makers, tinkerers, and builders - those with unorthodox perspectives and unconventional approaches to technology. This minor complements various other programs that may attract like-minded students.

Minor Code: 913

Arts, Media, and Technology Undergraduate Major (BA, BS, HBA, HBS)

Available only at OSU-Cascades.

This program provides students with the required skills needed for the contemporary visual arts and design fields. Specifically, the degree provides students with skills in digital imaging, video, design, interactivity, gaming, and 3D output as well as basic visual studies fundamentals in creative communication, color theory, image output and display. This program creates a unique educational experience within Oregon by providing a trans-disciplinary curriculum; traditional studio practice combined with communication and entrepreneurship coursework while also instilling technical practices for professional application. This coursework provides graduates with the content knowledge, experience, and technological skills that employers argue are necessary to be competitive in the 21st century arts and design industries and communities.

Major Code: 907

BA Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bacc Core 1</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>College of Liberal Arts BA</td>
<td>24</td>
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<tr>
<td></td>
<td>College of Liberal Arts Core</td>
<td>17</td>
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<td></td>
<td>Major (includes WI)</td>
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<td>Electives</td>
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BS Requirement

<table>
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<th>Title</th>
<th>Hours</th>
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<tbody>
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<td>Bacc Core 1</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>College of Liberal Arts BS</td>
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<tr>
<td></td>
<td>College of Liberal Arts Core</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Major (includes WI)</td>
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<tr>
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<td>Electives</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>180</td>
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</tbody>
</table>

Code Title Hours

AMT Core Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 101</td>
<td>*INTRODUCTION TO THE VISUAL ARTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 222</td>
<td>INTRODUCTION TO TIME-BASED ART</td>
<td>4</td>
</tr>
<tr>
<td>ART 215</td>
<td>COLOR IN THE VISUAL ARTS</td>
<td>4</td>
</tr>
<tr>
<td>ART 263</td>
<td>DIGITAL PHOTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>ART 339</td>
<td>PROFESSIONAL PRACTICES FOR ARTISTS</td>
<td>3</td>
</tr>
<tr>
<td>ART 349</td>
<td>VIDEO ART</td>
<td>4</td>
</tr>
</tbody>
</table>
**ART 366** | ART SINCE 1945 | 3
---|---|---
**ART 367** | *HISTORY OF DESIGN | 3
**ART 411** | *ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES | 3
**ART 422** | NEW MEDIA: INTERACTIVE | 4
**ART 451** | INTRODUCTION TO ARTS ENTREPRENEURSHIP | 3
**ART 403** | THESIS | 1-16
**ART 406** | PROJECTS | 1-16
**GD 110** | GRAPHIC DESIGN TOOLS AND TECHNIQUES (GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 1 [pending approval]) | 4
**GD 210** | (GRAPHIC DESIGN 1 [pending approval]) | 4
**GD 310** | (GRAPHIC DESIGN 2 [pending approval]) | 4
**GD 430** | GRAPHIC DESIGN PRACTICUM | 2
**GD 440** | (DESIGN RESEARCH PROJECTS [pending approval]) | 3
**NMC 101** | *INTRODUCTION TO NEW MEDIA COMMUNICATIONS | 3
**NMC 351** | NEW MEDIA VISUALIZATION | 4
**NMC 484** | NEW MEDIA ANIMATION | 4

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)
1 To fulfill the prerequisites of ART 366, AMT majors are advised to take the following courses as part of their Baccalaureate Core and College of Liberal Arts Core: ART 204 (BCC Western Culture, Year 1), ART 205 (BCC Literature and The Arts, Year 2), ART 206 (CLA Fine Arts, Year 2)

**Major Code: 907**

Students must add elective credits to meet the 180 total requirement.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
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<tr>
<td>Fall</td>
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</tr>
<tr>
<td>BACC MTH</td>
<td><strong>BACC</strong> MTH</td>
<td>4</td>
</tr>
<tr>
<td>BACC WRI</td>
<td><strong>BACC</strong> WRI</td>
<td>3</td>
</tr>
<tr>
<td>CLA BA or BS</td>
<td><strong>CLA</strong> BA or BS</td>
<td>3-4</td>
</tr>
<tr>
<td>ART 101</td>
<td><strong>ART</strong> 101</td>
<td>3</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>ART</strong> 101</td>
<td>13-14</td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART 204</td>
<td><strong>ART</strong> 204</td>
<td>3-4</td>
</tr>
<tr>
<td>BACC WRII</td>
<td><strong>BACC</strong> WRII</td>
<td>3</td>
</tr>
<tr>
<td>CLA BA or BS</td>
<td><strong>CLA</strong> BA or BS</td>
<td>4</td>
</tr>
<tr>
<td>ART 115</td>
<td><strong>ART</strong> 115</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>ART</strong> 115</td>
<td>14-15</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BACC CD</td>
<td><strong>BACC</strong> CD</td>
<td>3-4</td>
</tr>
<tr>
<td>BACC Fitness</td>
<td><strong>BACC</strong> Fitness</td>
<td>3</td>
</tr>
<tr>
<td>CLA BA or BS</td>
<td><strong>CLA</strong> BA or BS</td>
<td>4</td>
</tr>
<tr>
<td>ART 117</td>
<td><strong>ART</strong> 117</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td><strong>ART</strong> 117</td>
<td>14-15</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
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<tr>
<td>BACC DPD</td>
<td><strong>BACC</strong> DPD</td>
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<td>BACC Bio</td>
<td><strong>BACC</strong> Bio</td>
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<tr>
<td>CLA BA or BS</td>
<td><strong>CLA</strong> BA or BS</td>
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<tr>
<td>ART 121</td>
<td><strong>ART</strong> 121</td>
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<tr>
<td><strong>Hours</strong></td>
<td><strong>ART</strong> 121</td>
<td>15-16</td>
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<tr>
<td>Winter</td>
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<tr>
<td>BACC SPI</td>
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**Fourth Year**

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<td>CLA WRII</td>
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<tr>
<td>GD 440</td>
<td>Design Research Project [pending approval]</td>
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<td>ART 411</td>
<td>*ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES</td>
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<td>ART 422</td>
<td>NEW MEDIA: INTERACTIVE</td>
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<tr>
<td><strong>Hours</strong></td>
<td><strong>ART</strong> 422</td>
<td>13-14</td>
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<td>Winter</td>
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<tr>
<td>CLA SS</td>
<td><strong>CLA</strong> SS</td>
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<td>NMC 484</td>
<td>NEW MEDIA ANIMATION</td>
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<td>ART 403</td>
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<td><strong>Hours</strong></td>
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<td><strong>ART</strong> 406</td>
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<tr>
<td>or ART 410</td>
<td>or <strong>ART</strong> 410</td>
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<td>ART 451</td>
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<td><strong>Hours</strong></td>
<td><strong>ART</strong> 451</td>
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**Total Hours** 166-178

**Communication Minor**

Also available at OSU-Cascades.

**Minor Code: 983**

Communication minors must complete 27 credits, 18 of which must be upper division.
**Degree Requirements**

The Digital Communication Arts major requires a 2.0 GPA for admittance and a 2.3 GPA for graduation. Students must receive a C– or better in all degree course work. Classes for the major must be A–F grading and not S/U.

**BA/BS/HBA/HBS in Digital Communication Arts**

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<thead>
<tr>
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<tr>
<td>ART 121</td>
<td>DIGITAL CORE STUDIO</td>
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<tr>
<td>NMC 100</td>
<td>*NEW MEDIA AND CULTURE</td>
<td>3</td>
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<tr>
<td>NMC 101</td>
<td>*INTRODUCTION TO NEW MEDIA COMMUNICATIONS</td>
<td>3</td>
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<td>NMC 260</td>
<td>NEW MEDIA FUTURES</td>
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<td>NMC 301</td>
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**Intermediate Level**

Select 18-21 credits of the following: 1

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<td>PROPAGANDA AND SOCIAL CONTROL</td>
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<td>COMM 372</td>
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<td>COMM 385</td>
<td>COMMUNICATION AND CULTURE IN CYBERSPACE</td>
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<td>SURVEY OF SOCIAL MEDIA</td>
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</tr>
<tr>
<td>NMC 255</td>
<td>INTRODUCTION TO SOUND DESIGN</td>
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<td>NMC 320</td>
<td>HISTORY OF TELECOMMUNICATIONS</td>
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<td>NMC 321</td>
<td>HISTORY OF BROADCASTING</td>
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<td>NMC 322</td>
<td>LANDMARKS IN MEDIA CONTENT</td>
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<td>NMC 330</td>
<td>THE MEANING OF VIDEO GAMES</td>
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<tr>
<td>NMC 340</td>
<td>SOCIAL MEDIA STRATEGY</td>
<td></td>
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<tr>
<td>NMC 349</td>
<td>VIDEO ART</td>
<td></td>
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<tr>
<td>or ART 349</td>
<td>VIDEO ART</td>
<td></td>
</tr>
<tr>
<td>NMC 351</td>
<td>NEW MEDIA VISUALIZATION</td>
<td></td>
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<tr>
<td>NMC 355</td>
<td>APPLIED SOUND DESIGN</td>
<td></td>
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<tr>
<td>NMC 380</td>
<td>PRE-PRODUCTION</td>
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<tr>
<td>NMC 383</td>
<td>FIELD PRODUCTION</td>
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</tr>
<tr>
<td>NMC 388</td>
<td>SOCIAL MEDIA AND INTERPERSONAL RELATIONSHIPS</td>
<td></td>
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<tr>
<td>or COMM 388</td>
<td>SOCIAL MEDIA AND INTERPERSONAL RELATIONSHIPS</td>
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<tr>
<td>NMC 399</td>
<td>SPECIAL TOPICS</td>
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<td>PS 315</td>
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**Advanced Level**

Select 12-13 credits of the following: 2

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<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
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<td>ISSUES IN THE FREEDOM OF SPEECH</td>
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<td>COMM 484</td>
<td>MEDIA CRITICISM</td>
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<tr>
<td>NMC 409</td>
<td>PRACTICUM</td>
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</tr>
<tr>
<td>or NMC 410</td>
<td>INTERNSHIP</td>
<td></td>
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<tr>
<td>NMC 421</td>
<td>DIFFUSION OF INNOVATIONS</td>
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</table>
BFA/HBFA in Digital Communication Arts (Production)

**Core Requirements**

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<td>*NEW MEDIA AND CULTURE</td>
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<td>*INTRODUCTION TO NEW MEDIA COMMUNICATIONS</td>
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**Foundation Course Work**

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<td>2-D CORE STUDIO</td>
<td>4</td>
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<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
<td>4</td>
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<td>ART 263</td>
<td>DIGITAL PHOTOGRAPHY</td>
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<tr>
<td>NMC 322</td>
<td>LANDMARKS IN MEDIA CONTENT</td>
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<td>NMC 351</td>
<td>NEW MEDIA VISUALIZATION</td>
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<td>TA 242</td>
<td>VISUAL PRINCIPLES OF THEATRE</td>
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<td>TA 346</td>
<td>SCENE AND STAGE DESIGN</td>
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<td>WR 407</td>
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Select one of the following: 3-4

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<tr>
<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
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<td>FILM 125</td>
<td>*INTRODUCTION TO FILM STUDIES: 1945-PRESENT</td>
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<td>FILM 245</td>
<td>*THE NEW AMERICAN CINEMA</td>
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<td>FILM 265</td>
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**NMC Electives**

Select two of the following: 6

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<td>HISTORY OF TELECOMMUNICATIONS</td>
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<td>HISTORY OF BROADCASTING</td>
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<td>NMC 330</td>
<td>THE MEANING OF VIDEO GAMES</td>
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<td>NMC 399</td>
<td>SPECIAL TOPICS</td>
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<td>NMC 421</td>
<td>DIFFUSION OF INNOVATIONS</td>
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<td>NMC 427</td>
<td>*DIGITAL PORNOGRAPHY</td>
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<td>NMC 430</td>
<td>MEDIA THEORY</td>
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<td>NMC 435</td>
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**Production Course Work**

Select 10 courses of the following: 31-37

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<td>MUS 494</td>
<td>INTERMEDIATE RECORDING TECHNIQUES</td>
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<td>MUS 495</td>
<td>ADVANCED RECORDING TECHNIQUES</td>
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<td>MUS 496</td>
<td>SURROUND SOUND RECORDING AND MASTERING</td>
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<td>INTRODUCTION TO SOUND DESIGN</td>
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<tr>
<td>NMC 349</td>
<td>VIDEO ART</td>
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<tr>
<td>or ART 349</td>
<td>VIDEO ART</td>
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<tr>
<td>NMC 355</td>
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<td>PRACTICUM</td>
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<td>or NMC 410</td>
<td>INTERNSHIP</td>
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<td>NMC 481</td>
<td>COMPOSING AND DIGITAL EFFECTS</td>
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<td>NMC 483</td>
<td>NEW MEDIA 3-D</td>
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<td>NMC 498</td>
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Total credits required for graduation 180

1. Taken as three 1-credit courses or two 1-credit and one 2-credit courses or one 3-credit course. Must equal a minimum total of 3 credits to count as one course in this level. Can combine NMC 409 and NMC 410 credits to equal three.

* Baccalaureate Core Course (BCC)

Students will complete a total of 45-49 credits in the BA/BS degree in Digital Communication Arts.

---

**Graphic Design Undergraduate Major (BFA, HBFA)**

The Bachelor of Fine Arts degree in Graphic Design (GD) is an exciting and rigorous program at OSU. The disciplinary foundations of graphic design are rooted in visual problem solving, design theory and history, as well as professional practices that tie into business and marketing for specific audiences. Examples of the work graphic designers engage in include both print and digital media such as the design of:

- branding and visual identities
- publication design (magazines, newspapers, catalogs)
- information design
- package design
- exhibition design
- interactive design (Web, video)

The discipline of graphic design is constantly changing due to new technologies, broader target audiences, and softer boundaries between disciplines. Students learn to be adaptable, flexible and collaborative in how they work. Graphic designers are creative thinkers and makers and may have strengths and interests in drawing, printmaking and photography.
The Graphic Design major is a professional program. Entering students are designated as Pre-Graphic Design majors.

The pre-professional Graphic Design program typically takes one year to complete. After completing the pre-professional program requirements, students may apply to the professional Graphic Design program. Students will not be permitted to take professional Graphic Design course work without acceptance into the professional Graphic Design program. If admitted into the professional Graphic Design program, it will take students three additional years to complete the professional program regardless of transfer credit standing.

Admission into the professional Graphic Design program is subject to a competitive application process. To apply and be considered for admission, all pre-professional students must meet the following requirements:

- Be declared as a Pre-Graphic Design major.
- Have completed and received a C– or better in ALL courses within the Pre-Graphic Design major by the end of spring term before applying.

Criteria for acceptance. Students will be evaluated on the following:

- Completion and grade in GD 126.
- Completion and grades in GD Foundation courses: ART 101, ART 115, ART 121, and ART 131.
- Completion and grades in Bacc Core First-Year Skills Requirements: WR 121, Speech course (choose one: COMM 111, COMM 114, or COMM 218) and College Level Math course: MTH 105 *INTRODUCTION TO CONTEMPORARY MATHEMATICS or higher.
- Overall GPA.

Major Code: 779

Pre-Graphic Design Major Code: 479

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<td>ART 204</td>
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<td>*INTRODUCTION TO WESTERN ART: GOTHIC TO BAROQUE</td>
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<td>ART 206</td>
<td>*INTRODUCTION TO WESTERN ART: NEOCLASSICISM TO CONTEMPORARY</td>
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<td>ART 208</td>
<td>*INTRODUCTION TO ASIAN ART</td>
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<td>ART 264</td>
<td>*PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART</td>
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<td>GD 200</td>
<td>GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 1</td>
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<td>GD 224</td>
<td>INTERACTIVE DESIGN 1</td>
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<td>GD 226</td>
<td>TYPOGRAPHY 1</td>
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<td>PROCESS: MAKING AND MEANING</td>
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<td>GRAPHIC DESIGN HISTORY</td>
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<td>*PUBLIC SPEAKING</td>
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<td>COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
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<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
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<tr>
<td>MTH 111</td>
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<td>GD 230</td>
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<td>GD 269</td>
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Major Code: 779

Pre-Graphic Design Major Code: 479

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<td>COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
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<tr>
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<tr>
<td></td>
<td>Spring</td>
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<tr>
<td>ART 206</td>
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<tr>
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<tr>
<td>GD 200</td>
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<td>GD 220</td>
<td>GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 2</td>
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<td>GD 224</td>
<td>INTERACTIVE DESIGN 1</td>
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<tr>
<td>GD 226</td>
<td>TYPOGRAPHY 1</td>
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<td>GD 228</td>
<td>PROCESS: MAKING AND MEANING</td>
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<td>GRAPHIC DESIGN PROFESSIONAL DEVELOPMENT</td>
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<tbody>
<tr>
<td></td>
<td>Bacc Core (Physical Lab Science)</td>
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Total credits required to graduate with the BFA is 180

Total Hours: 180-196
Winter
ART 263  DIGITAL PHOTOGRAPHY  4
GD 224  INTERACTIVE DESIGN I  4
GD 269  GRAPHIC DESIGN HISTORY  3
Bacc Core (Biological Lab Science)  4

Spring
GD 220  GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION II  4
GD 228  PROCESS: MAKING AND MEANING  4
GD Lower-Division Elective  4
Bacc Core (Lab Science)  4

Third Year
Fall
GD 326  TYPOGRAPHY II  4
GD 328  INTERACTIVE II  4
GD Upper-Division Elective  4
Bacc Core (WR II)  3

Winter
GD 325  GRAPHIC DESIGN: COLLABORATIVE PROCESSES  4
GD Upper-Division Elective  4
GD Upper-Division Elective  4
Bacc Core (Literature and Arts)  3

Spring
ART 367  *HISTORY OF DESIGN  3
GD 312  *CONTEMPORARY ISSUES IN DESIGN  3
GD 327  TYPOGRAPHY III  4
HHS 231  *LIFETIME FITNESS FOR HEALTH  2
PAC Course  1
General Elective  2

Fourth Year
Fall
GD 420  PROFESSIONAL PRACTICES  3
GD 424  BRAND IDENTITY SYSTEMS  4
Bacc Core (Cultural Diversity)  3
General Elective  5

Winter
GD 419  PORTFOLIO REVIEW  3
GD 426  GRAPHIC DESIGN CAPSTONE I  3
GD Upper-Division Elective  4
Bacc Core (Upper-division CGI)  3
General Elective  2

Spring
GD 427  CAPSTONE II  4
GD Upper-Division Elective  4
Bacc Core (Upper-division STS)  3
Bacc Core (Western Culture)  3
General Elective  2

Total Hours  181

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Guitar Minor

A Guitar Minor designed to introduce students to essential concepts in music theory, history, technology, and performance in both the solo and ensemble mediums.

Minor Code: 906

Lower Division
Select 6 credits from the following: 1

- MUP 196  INDIVIDUAL LESSONS: GUITAR
- MUP 296  INDIVIDUAL LESSONS: GUITAR
- MUS 121  LITERATURE AND MATERIALS OF MUSIC I
- MUS 162  CHAMBER ENSEMBLE: GUITAR

Select 3 credits from the following: 3

- MUS 111  THE FUNDAMENTALS OF MUSIC TECHNOLOGY
- MUS 112  INTRODUCTION TO DIGITAL AUDIO
- MUS 113  AUDIO TECHNOLOGIES

Upper Division
Select 6 credits from the following: 1

- MUP 396  INDIVIDUAL LESSONS: GUITAR
- MUP 496  INDIVIDUAL LESSONS: GUITAR
- MUS 362  CHAMBER ENSEMBLE: GUITAR

Select 3 credits from the following: 3

- MUS 324  HISTORY OF WESTERN MUSIC
- MUS 325  *HISTORY OF WESTERN MUSIC
- MUS 326  HISTORY OF WESTERN MUSIC

Total Hours  27

^ Writing Intensive Course (WIC)
1 Select a combination of 1 or 2 credit lessons per term to equal 6 credits total

Minor Code: 906

Music Graduate Minor

Graduate Areas of Concentration

Composition, conducting, music education, performance

The School of Arts and Communication participates in the Master of Arts in Interdisciplinary Studies degree and Master of Arts in Teaching degree. Contact the school for entrance requirements for the MAT degree. Areas of specialization include performance, conducting, composition, music history, and music education.

Through the School of Arts and Communication, graduate students may participate in the following programs: Professional Music Teacher Education, the Master of Arts in Teaching (MAT), the Master of Arts in Interdisciplinary Studies (MAIS), and the Master of Education (EdM) with a focus in music education. The school offers graduate courses in music, music education, and music performance. OSU’s music education program is approved by the state of Oregon Teachers Standards and Practices Commission (TSPC) and the National Council for Accreditation of Teacher Education (NCATE). With careful planning, students may complete both the initial and continuing teaching licensure requirements, as well as a master’s degree.

For more information, contact the Music Education Coordinator, Oregon State University, 101 Community Hall, Corvallis, OR 97331.
**Minor Code: 9500**

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**Music Minor**

Students majoring in other disciplines may elect the Music minor.

**Minor Code: 950**

**Core**

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MUS 121</td>
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<tr>
<td>MUS 122 &amp; MUS 123</td>
<td>LITERATURE AND MATERIALS OF MUSIC I</td>
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**Electives in music**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>and LITERATURE AND MATERIALS OF MUSIC I</td>
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**Upper-division Electives**

Select 12 credits from the following:

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<th>Course</th>
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<tbody>
<tr>
<td>CS 395</td>
<td>WEBSITE MULTIMEDIA</td>
</tr>
<tr>
<td>MUED 477</td>
<td>CLASSROOM INSTRUMENTAL TECHNIQUES</td>
</tr>
<tr>
<td>MUP 390 - MUS 596</td>
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<tr>
<td>MUS 340</td>
<td>OSU CHAMBER CHOIR</td>
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<tr>
<td>MUS 350</td>
<td>SYMPHONIC BAND</td>
</tr>
<tr>
<td>MUS 357</td>
<td>SMALL JAZZ ENSEMBLE</td>
</tr>
<tr>
<td>MUS 360</td>
<td>UNIVERSITY SYMPHONY ORCHESTRA</td>
</tr>
<tr>
<td>MUS 363</td>
<td>ACCOMPANYING (6 credit maximum)</td>
</tr>
<tr>
<td>MUS 324</td>
<td>HISTORY OF WESTERN MUSIC</td>
</tr>
<tr>
<td>MUS 325 &amp; MUS 326</td>
<td>HISTORY OF WESTERN MUSIC</td>
</tr>
<tr>
<td>MUS 422</td>
<td>GENRE STUDIES</td>
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<tr>
<td>MUS 443</td>
<td>THEORY AND COMPOSITION STUDIES</td>
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<tr>
<td>MUS 493</td>
<td>BASIC RECORDING TECHNIQUES</td>
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<td>MUS 494</td>
<td>INTERMEDIATE RECORDING TECHNIQUES</td>
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<td>MUS 495</td>
<td>ADVANCED RECORDING TECHNIQUES</td>
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<td>MUS 496</td>
<td>SURROUND SOUND RECORDING AND MASTERING</td>
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<tr>
<td>PH 331</td>
<td>*SOUND, HEARING, AND MUSIC</td>
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**Total Hours** 27

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**Minor Code: 950**

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**Music Performance Minor**

The Music Performance minor focuses attention on the development of performance skills in studio lessons and ensembles that contribute to aptitudes and proficiencies necessary for a lifetime participation in the arts.

**Minor Code: 936**

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**Music Studies Undergraduate Major (BM, HBM)**

This program will be admitting students from Fall 2020 forward.

The BM in Music Studies is designed for entering students preparing for careers in music education and performance. The curriculum provides a comprehensive and complete music education preparing students for successful careers in the arts in the 21st century creative economy.

**Major Code: 093**

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<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>MUS 108</td>
<td>*MUSIC CULTURES OF THE WORLD</td>
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<tr>
<td>MUS 121</td>
<td>LITERATURE AND MATERIALS OF MUSIC I</td>
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* Baccalaureate Core Course (BCC)
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<td>MUS 134</td>
<td>AURAL SKILLS I</td>
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<td>&amp; MUS 136</td>
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<td>MUS 171</td>
<td>GROUP LESSONS: PIANO I 1</td>
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<tr>
<td>MUS 172</td>
<td>GROUP PIANO II</td>
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<tr>
<td>MUS 173</td>
<td>GROUP PIANO III</td>
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<td>&amp; MUS 223</td>
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### Required Option

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**Total Hours**: 180

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* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

1 Students in the Piano Performance Option may test out of these courses

### Major Code: 093

#### First Year

**Fall**

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<tr>
<th>Course</th>
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<tr>
<td>MUS 121</td>
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<td>MUS 134</td>
<td>AURAL SKILLS I</td>
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<td>MUS 171</td>
<td>GROUP LESSONS: PIANO I</td>
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<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<td>or COMM 114</td>
<td>or *ARGUMENT AND CRITICAL DISCOURSE</td>
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<tr>
<td>or COMM 218</td>
<td>or *INTERPERSONAL COMMUNICATION</td>
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**Winter**

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<tr>
<th>Course</th>
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<tr>
<td>MUS 108</td>
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<tr>
<td>MUS 122</td>
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<tr>
<td>MUS 135</td>
<td>AURAL SKILLS II</td>
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<tr>
<td>MUS 172</td>
<td>GROUP PIANO II</td>
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<td>Option Course</td>
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#### Second Year

**Fall**

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**Winter**

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<td>MUS 235</td>
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#### Third Year

**Fall**

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<td>4</td>
</tr>
<tr>
<td>Bacc Core: Science</td>
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**Winter**

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>MUS 325</td>
<td>*HISTORY OF WESTERN MUSIC</td>
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#### Spring

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<td>MUS 326</td>
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#### Fourth Year

**Fall**

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<tbody>
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<td>MUS 315</td>
<td>INTRODUCTION TO CONDUCTING</td>
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<tr>
<td>Option Course</td>
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<tr>
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<td>Option Course</td>
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<table>
<thead>
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<th>Hours</th>
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<tbody>
<tr>
<td>MUS 221</td>
<td>LITERATURE AND MATERIALS OF MUSIC</td>
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**Bacc Core: Western Culture:** 15 Hours

**Hours:** 15

**Writing Intensive Course (WIC):**

**Elective:** 3 Hours

**Elective:** 2 Hours

**Elective:** 1 Hour

**Elective:** 1 Hour

**Elective:** 1 Hour

---

**Bacc Core: Math:** 4 Hours

**Hours:** 14
Instrumental Performance Option

This option is offered within the following major(s):

- Music Studies - College of Liberal Arts (p. 632)

Option Code: 095

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>MUS 111</td>
<td>THE FUNDAMENTALS OF MUSIC TECHNOLOGY</td>
<td>3</td>
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<tr>
<td>MUS 251</td>
<td>INTRO TO ARTS ENTREPRENEURSHIP</td>
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<td>MUS 344</td>
<td>INSTRUMENTAL PEDAGOGY AND REPERTOIRE</td>
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<td>MUS 400</td>
<td>*STUDIES IN WRITING ABOUT MUSIC</td>
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<td>MUS 443</td>
<td>THEORY AND COMPOSITION STUDIES</td>
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<tr>
<td>MUS 493</td>
<td>BASIC RECORDING TECHNIQUES</td>
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</tbody>
</table>

Upper division music elective

Studio Instruction

MUP 100-level Individual Lessons

Select six credits from the appropriate instrument in your specialization: 6

MUP 192 | INDIVIDUAL LESSONS: STRINGS               |       |
MUP 193 | INDIVIDUAL LESSONS: WOODWINDS            |       |
MUP 194 | INDIVIDUAL LESSONS: BRASS                |       |
MUP 195 | INDIVIDUAL LESSONS: PERCUSSION           |       |
MUP 196 | INDIVIDUAL LESSONS: GUITAR               |       |

MUP 200-level Individual Lessons

Select six credits from the appropriate instrument in your specialization: 6

MUP 292 | INDIVIDUAL LESSONS: STRINGS               |       |
MUP 293 | INDIVIDUAL LESSONS: WOODWINDS            |       |
MUP 294 | INDIVIDUAL LESSONS: BRASS                |       |
MUP 295 | INDIVIDUAL LESSONS: PERCUSSION           |       |
MUP 296 | INDIVIDUAL LESSONS: GUITAR               |       |

MUP 300-level Individual Lessons

Select six credits from the appropriate instrument in your specialization: 6

MUP 392 | INDIVIDUAL LESSONS: STRINGS               |       |
MUP 393 | INDIVIDUAL LESSONS: WOODWINDS            |       |
MUP 394 | INDIVIDUAL LESSONS: BRASS                |       |
MUP 395 | INDIVIDUAL LESSONS: PERCUSSION           |       |

Total Hours 180

Winter

MUS 400 | *STUDIES IN WRITING ABOUT MUSIC           | 3     |
Option Course 1 |                                  | 1     |
Option Course 2 |                                  | 2     |
Option Course 2 |                                  | 2     |
Bacc Core: Difference, Power & Discrimination 3

Hours 15

Spring

Option Course 1 |                                  | 1     |
Option Course 2 |                                  | 1     |
Option Course 2 |                                  | 2     |
Bacc Core: Social Processes & Institutions 4
Bacc Core: Contemporary Global Issues 3

Elective 3

Hours 15

Total Hours 180
Music Education Option

This option is offered within the following major(s):

- Music Studies - College of Liberal Arts (p. 632)

Option Code: 096

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<td><strong>Coursework</strong></td>
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<td>Advanced Conducting</td>
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<td>Select two courses from the following:</td>
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<tr>
<td></td>
<td>MUS 316 CHORAL CONDUCTING</td>
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<td>MUS 317 CHORAL CONDUCTING</td>
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<td>MUS 318 INSTRUMENTAL CONDUCTING</td>
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<td>MUS 319 INSTRUMENTAL CONDUCTING</td>
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<td>MUED 100 MUSIC EDUCATION IN PUBLIC SCHOOLS</td>
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<td>MUED 275 PROFESSIONAL SEMINAR IN MUSIC EDUCATION I</td>
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<td></td>
<td>MUED 276 PROFESSIONAL SEMINAR IN MUSIC EDUCATION II</td>
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<td></td>
<td>MUED 277 PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR I</td>
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<td>MUED 375 PROFESSIONAL SEMINAR IN MUSIC EDUCATION III</td>
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<td>MUED 376 PROFESSIONAL SEMINAR IN MUSIC EDUCATION IV</td>
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<td>Select four credits from the following courses:</td>
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<td>MUED 202 VOCAL DICTION SEMINAR II: ITALIAN AND FRENCH</td>
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<td>MUS 271 GROUP PIANO IV</td>
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<td>MUS 272 GROUP PIANO V</td>
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<td>MUS 273 GROUP PIANO VI</td>
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<tr>
<td></td>
<td>MUED 350 JAZZ PEDAGOGY</td>
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<td>MUED 392 SEMINAR IN SECONDARY GENERAL MUSIC</td>
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<td>MUED 450 SURVEY OF WIND LITERATURE</td>
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<td>MUED 469 MARCHING BAND TECHNIQUES LABORATORY</td>
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<td>MUED 474 ELEMENTARY APPROACHES SEMINAR I</td>
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<td>MUED 475 ELEMENTARY APPROACHES SEMINAR II</td>
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<td>MUED 391 SECONDARY GENERAL MUSIC FOUNDATIONS</td>
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<td>MUED 406 PROJECT (repeatable up to 18 credits)</td>
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<td>MUED 410 INTERNSHIP/STUDENT TEACHING</td>
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<td>MUED 470 METHODS AND MATERIALS FOR THE PUBLIC SCHOOL WIND BAND</td>
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<td>MUED 473 METHODS FOR TEACHING ELEMENTARY MUSIC</td>
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<td>MUED 480 CLASSROOM CHORAL METHODS</td>
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<td>MUS 400 *STUDIES IN WRITING ABOUT MUSIC</td>
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<td>ED 216 *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A DEMOCRACY</td>
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<td>ED 219 CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION</td>
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<td>ED 253 LEARNING ACROSS THE LIFESPAN</td>
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<td>ED 472 FOUNDATIONS OF ESOL EDUCATION</td>
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<tr>
<td></td>
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<td></td>
<td>MUP 100-level Individual Lessons</td>
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<td>MUP 190 INDIVIDUAL LESSONS: KEYBOARD</td>
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<td>MUP 191 INDIVIDUAL LESSONS: VOICE</td>
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<td>MUP 192 INDIVIDUAL LESSONS: STRINGS</td>
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<td>MUP 193 INDIVIDUAL LESSONS: WOODWINDS</td>
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<td>MUP 195 INDIVIDUAL LESSONS: PERCUSSION</td>
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<td>MUP 196 INDIVIDUAL LESSONS: GUITAR</td>
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<td>MUP 200-level Individual Lessons</td>
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<td>Select three credits based on your specialization:</td>
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<td>MUP 290 INDIVIDUAL LESSONS: KEYBOARD</td>
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<td>MUP 291 INDIVIDUAL LESSONS: VOICE</td>
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<td>MUP 292 INDIVIDUAL LESSONS: STRINGS</td>
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<td>MUP 293 INDIVIDUAL LESSONS: WOODWINDS</td>
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<td>MUP 296 INDIVIDUAL LESSONS: GUITAR</td>
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<td>MUP 298 JUNIOR RECITAL</td>
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<td>MUS 100-level Ensembles</td>
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<td>MUS 300-level Ensembles</td>
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Piano Performance and Pedagogy Option

This option is offered within the following major(s):

- Music Studies - College of Liberal Arts (p. 632)

Option Code: 098

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<td>MUS 251 INTRO TO ARTS ENTREPRENEURSHIP</td>
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<td>MUED 277 PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR</td>
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<td>MUS 330 ALEXANDER TECHNIQUE FOR MUSICIANS</td>
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<td>MUS 375 INTRODUCTION TO PIANO TUNING</td>
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<td>MUS 378 MUSICAL WELLNESS FOR PIANISTS</td>
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<td>MUS 409 PIANO PEDAGOGY PRACTICUM</td>
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<td>MUS 443 THEORY AND COMPOSITION STUDIES</td>
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<td>MUS 445 PIANO PEDAGOGY I: BEGINNING AND ELEMENTARY STUDENTS</td>
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<td>MUS 446 PIANO PEDAGOGY II</td>
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<td>MUS 447 PIANO PEDAGOGY III</td>
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<td>MUS 481 PIANO LITERATURE I: 18TH THROUGH EARLY 19TH CENTURIES</td>
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<td>MUS 482 PIANO LITERATURE II: 19TH AND 20TH CENTURIES</td>
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<td>MUS 485 PIANO LITERATURE III: REPERTOIRE FOR TEACHING THE PIANO</td>
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<td>MUS 400 *STUDIES IN WRITING ABOUT MUSIC</td>
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</tbody>
</table>

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

1 Take two credits per term
Studio Instruction

MUP 190 INDIVIDUAL LESSONS: KEYBOARD (3 terms, 2 credits each) 6
MUP 290 INDIVIDUAL LESSONS: KEYBOARD (3 terms, 2 credits each) 6
MUP 390 INDIVIDUAL LESSONS: KEYBOARD (3 terms, 2 credits each) 6
MUP 490 INDIVIDUAL LESSONS: KEYBOARD (3 terms, 2 credits each) 6
MUP 398 JUNIOR RECITAL 1
or MUS 406 PROJECTS
MUP 498 SENIOR RECITAL 1
or MUS 406 PROJECTS

Ensembles/Chamber Music

MUS 163 ACCOMPANYING (3 terms, 1 credit each) 3
MUS 363 ACCOMPANYING
MUS 358 CHAMBER ENSEMBLE: MISCELLANEOUS
MUS 272 GROUP PIANO V
MUS 273 GROUP PIANO VI

Total Hours 79

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 097

Piano Performance Option

This option is offered within the following major(s):

• Music Studies - College of Liberal Arts (p. 632)

Option Code: 094

Vocal Performance, Pedagogy and Literature Option

This option is offered within the following major(s):

• Music Studies - College of Liberal Arts (p. 632)
Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Option Code: 094

Music Undergraduate Major (BA, BS, HBA, HBS)

Major Code: 950

Departmental degree requirements are 47 credits, of which 24 must be upper division. The College of Liberal Arts allows only 12 credits of MUP courses to be applied toward a degree.

A grade of C– or better is required for all courses used to complete music major requirements. These courses cannot be taken with S/U grading.

Transfer students must demonstrate competency in the areas of music history, music theory, aural skills, and piano skills. Placement examinations in each of these areas must be completed by Wednesday of the first week of classes.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
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<td><strong>Required Core Classes for ALL options/emphases</strong></td>
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<td><strong>Baccalaureate Core</strong></td>
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<td>MUS 177</td>
<td>GROUP LESSONS: PIANO</td>
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<tr>
<td>MUS 121</td>
<td>LITERATURE AND MATERIALS OF MUSIC I</td>
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<td>&amp; MUS 122</td>
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<tr>
<td>&amp; MUS 123</td>
<td>and LITERATURE AND MATERIALS OF MUSIC I</td>
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<tr>
<td>MUS 125</td>
<td>LITERATURE AND MATERIALS LAB I</td>
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<td>&amp; MUS 126</td>
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<td>MUS 135</td>
<td>AURAL SKILLS II</td>
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<td>MUS 221</td>
<td>LITERATURE AND MATERIALS OF MUSIC</td>
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<td>MUS 315</td>
<td>INTRODUCTION TO CONDUCTING</td>
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<td>MUS 321</td>
<td>LITERATURE AND MATERIALS OF MUSIC III</td>
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<td>MUS 324</td>
<td>HISTORY OF WESTERN MUSIC</td>
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<td>MUS 325</td>
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<td>MUS 326</td>
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<tr>
<td>Upper-division Electives</td>
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<td>Total credits required for graduation</td>
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Instrumental Performance Option

This option is offered within the following major(s):

- Music - College of Liberal Arts (p. 637)

Option Code: 901

Select 6 credits of Individual Lessons at 300 level 6

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<thead>
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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MUP 394</td>
<td>INDIVIDUAL LESSONS: BRASS</td>
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<td>MUP 395</td>
<td>INDIVIDUAL LESSONS: PERCUSSION</td>
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<tr>
<td>MUP 396</td>
<td>INDIVIDUAL LESSONS: GUITAR</td>
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Select 6 credits of Individual Lessons at 400 level 6

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<tbody>
<tr>
<td>MUS 234</td>
<td>AURAL SKILLS II</td>
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<tr>
<td>&amp; MUS 235</td>
<td>and AURAL SKILLS II</td>
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<td>&amp; MUS 236</td>
<td>and AURAL SKILLS II</td>
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<td>MUS 273</td>
<td>GROUP PIANO VI</td>
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<td>MUP 492</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
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<td>MUP 493</td>
<td>INDIVIDUAL LESSONS: WOODWINDS</td>
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<td>MUP 494</td>
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<td>MUP 495</td>
<td>INDIVIDUAL LESSONS: PERCUSSION</td>
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<tr>
<td>MUP 496</td>
<td>INDIVIDUAL LESSONS: GUITAR</td>
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Select 6 credits of Instrumental Ensembles 6

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<tbody>
<tr>
<td>MUS 350</td>
<td>SYMPHONIC BAND</td>
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<td>MUS 351</td>
<td>CAMPUS BAND</td>
<td></td>
</tr>
<tr>
<td>MUS 358</td>
<td>LARGE JAZZ ENSEMBLE</td>
<td></td>
</tr>
<tr>
<td>MUS 360</td>
<td>UNIVERSITY SYMPHONY ORCHESTRA</td>
<td></td>
</tr>
</tbody>
</table>

Upper-division Music Technology 9

Option Code: 901

Music Education Option

This option is offered within the following major(s):

- Music - College of Liberal Arts (p. 637)

Option Code: 944

Choral Emphasis

Application may be made upon acceptance to 300-level individual lessons, completion of MUED 100 and with permission of the faculty program director.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUED 100</td>
<td>MUSIC EDUCATION IN PUBLIC SCHOOLS</td>
<td>3</td>
</tr>
<tr>
<td>MUED 277</td>
<td>PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR</td>
<td>7</td>
</tr>
<tr>
<td>MUED 473</td>
<td>METHODS FOR TEACHING ELEMENTARY MUSIC</td>
<td>3</td>
</tr>
<tr>
<td>MUED 478</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Select 5 credits from the following individual lessons: 5

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUP 390</td>
<td>INDIVIDUAL LESSONS: KEYBOARD</td>
<td></td>
</tr>
<tr>
<td>MUP 391</td>
<td>INDIVIDUAL LESSONS: VOICE</td>
<td></td>
</tr>
<tr>
<td>MUP 490</td>
<td>INDIVIDUAL LESSONS: KEYBOARD</td>
<td></td>
</tr>
<tr>
<td>MUP 491</td>
<td>INDIVIDUAL LESSONS: VOICE</td>
<td></td>
</tr>
</tbody>
</table>

Select 3 credits from the following choral ensembles: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 140</td>
<td>OSU CHAMBER CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 146</td>
<td>WOMEN'S CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 147</td>
<td>MEN'S CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 234</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>&amp; MUS 235</td>
<td>and AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>&amp; MUS 236</td>
<td>and AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 235</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 236</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 273</td>
<td>GROUP PIANO VI</td>
<td></td>
</tr>
<tr>
<td>MUS 316</td>
<td>CHORAL CONDUCTING</td>
<td></td>
</tr>
<tr>
<td>&amp; MUS 317</td>
<td>and CHORAL CONDUCTING</td>
<td></td>
</tr>
</tbody>
</table>

Select 3 credits from the following choral ensembles: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 340</td>
<td>OSU CHAMBER CHOIR</td>
<td></td>
</tr>
</tbody>
</table>
### Music Production Option

Option Code: 944

**Instrumental Emphasis**

Application may be made upon acceptance to 300-level individual lessons, completion of MUED 100 and permission of faculty program director.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUED 100</td>
<td>MUSIC EDUCATION IN PUBLIC SCHOOLS</td>
<td>3</td>
</tr>
<tr>
<td>MUED 277</td>
<td>PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR</td>
<td>7</td>
</tr>
<tr>
<td>MUED 473</td>
<td>METHODS FOR TEACHING ELEMENTARY MUSIC</td>
<td>3</td>
</tr>
<tr>
<td>MUED 478</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Select 5 credits from the following individual lessons:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUP 390</td>
<td>INDIVIDUAL LESSONS: KEYBOARD</td>
<td></td>
</tr>
<tr>
<td>MUP 391</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
<td></td>
</tr>
<tr>
<td>MUP 392</td>
<td>INDIVIDUAL LESSONS: WOODWINDS</td>
<td></td>
</tr>
<tr>
<td>MUP 394</td>
<td>INDIVIDUAL LESSONS: BRASS</td>
<td></td>
</tr>
<tr>
<td>MUP 395</td>
<td>INDIVIDUAL LESSONS: PERCUSSION</td>
<td></td>
</tr>
<tr>
<td>MUP 490</td>
<td>INDIVIDUAL LESSONS: KEYBOARD</td>
<td></td>
</tr>
<tr>
<td>MUP 492</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
<td></td>
</tr>
<tr>
<td>MUP 493</td>
<td>INDIVIDUAL LESSONS: WOODWINDS</td>
<td></td>
</tr>
<tr>
<td>MUP 494</td>
<td>INDIVIDUAL LESSONS: BRASS</td>
<td></td>
</tr>
<tr>
<td>MUP 495</td>
<td>INDIVIDUAL LESSONS: PERCUSSION</td>
<td></td>
</tr>
<tr>
<td>MUS 234</td>
<td>AURAL SKILLS II &amp; MUS 235 and AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 235</td>
<td>AURAL SKILLS II &amp; MUS 236 and AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 236</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 273</td>
<td>GROUP PIANO VI</td>
<td></td>
</tr>
<tr>
<td>MUS 318</td>
<td>INSTRUMENTAL CONDUCTING &amp; MUS 319 and INSTRUMENTAL CONDUCTING</td>
<td></td>
</tr>
<tr>
<td>MUS 319</td>
<td>INSTRUMENTAL CONDUCTING</td>
<td></td>
</tr>
</tbody>
</table>

Select 6 credits from the following instrumental ensembles:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 350</td>
<td>SYMPHONIC BAND</td>
<td>6</td>
</tr>
<tr>
<td>MUS 360</td>
<td>UNIVERSITY SYMPHONY ORCHESTRA</td>
<td></td>
</tr>
</tbody>
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Total Hours: 26

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 150</td>
<td>SYMPHONIC BAND</td>
<td></td>
</tr>
<tr>
<td>MUS 160</td>
<td>UNIVERSITY SYMPHONY ORCHESTRA</td>
<td></td>
</tr>
<tr>
<td>MUS 234</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 235</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 236</td>
<td>AURAL SKILLS II</td>
<td></td>
</tr>
<tr>
<td>MUS 273</td>
<td>GROUP PIANO VI</td>
<td></td>
</tr>
<tr>
<td>MUS 315</td>
<td>INTRODUCTION TO CONDUCTING</td>
<td></td>
</tr>
<tr>
<td>MUS 316</td>
<td>CHORAL CONDUCTING</td>
<td></td>
</tr>
<tr>
<td>MUS 317</td>
<td>CHORAL CONDUCTING</td>
<td></td>
</tr>
<tr>
<td>MUS 318</td>
<td>INSTRUMENTAL CONDUCTING</td>
<td></td>
</tr>
<tr>
<td>MUS 356</td>
<td>UNIVERSITY SYMPHONY ORCHESTRA</td>
<td></td>
</tr>
<tr>
<td>MUS 399</td>
<td>SPECIAL STUDIES</td>
<td></td>
</tr>
</tbody>
</table>

Select 3 credits from the following choral ensembles or instrumental ensembles:

Junior or Senior Recital

Total Hours: 20

Option Code: 937

### Music Production Option

This option is offered within the following major(s):

- Music - College of Liberal Arts (p. 637)

Application may be made after successful completion of MUS 223 and with permission of the faculty program director.

### General Emphasis

Application may be made after successful completion of MUED 100 and permission of faculty program director.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUED 100</td>
<td>MUSIC EDUCATION IN PUBLIC SCHOOLS</td>
<td>3</td>
</tr>
<tr>
<td>MUED 277</td>
<td>PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR</td>
<td>1</td>
</tr>
<tr>
<td>MUED 473</td>
<td>METHODS FOR TEACHING ELEMENTARY MUSIC</td>
<td>3</td>
</tr>
<tr>
<td>MUED 478</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Select 5 credits from the following individual lessons:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUP 390</td>
<td>INDIVIDUAL LESSONS: KEYBOARD</td>
<td></td>
</tr>
<tr>
<td>MUP 391</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
<td></td>
</tr>
<tr>
<td>MUP 392</td>
<td>INDIVIDUAL LESSONS: VOICE</td>
<td></td>
</tr>
<tr>
<td>MUP 393</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
<td></td>
</tr>
</tbody>
</table>

Select 3 credits from the following choral ensembles or instrumental ensembles:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 140</td>
<td>OSU CHAMBER CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 146</td>
<td>WOMEN'S CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 147</td>
<td>MEN'S CHOIR</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 26

Option Code: 937

### Piano Performance Option

This option is offered within the following major(s):

- Music - College of Liberal Arts (p. 637)

Application may be made with permission from the piano program director.

### General Emphasis

Application may be made after successful completion of MUED 100 and permission of faculty program director.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUED 100</td>
<td>MUSIC EDUCATION IN PUBLIC SCHOOLS</td>
<td>3</td>
</tr>
<tr>
<td>MUED 277</td>
<td>PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR</td>
<td>1</td>
</tr>
<tr>
<td>MUED 473</td>
<td>METHODS FOR TEACHING ELEMENTARY MUSIC</td>
<td>3</td>
</tr>
<tr>
<td>MUED 478</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Select 5 credits from the following individual lessons:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUP 390</td>
<td>INDIVIDUAL LESSONS: KEYBOARD</td>
<td></td>
</tr>
<tr>
<td>MUP 391</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
<td></td>
</tr>
<tr>
<td>MUP 392</td>
<td>INDIVIDUAL LESSONS: STRINGS</td>
<td></td>
</tr>
</tbody>
</table>

Select 3 credits from the following choral ensembles or instrumental ensembles:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 140</td>
<td>OSU CHAMBER CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 146</td>
<td>WOMEN'S CHOIR</td>
<td></td>
</tr>
<tr>
<td>MUS 147</td>
<td>MEN'S CHOIR</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 26

Option Code: 951
Vocal Performance Option

This option is offered within the following major(s):

- Music - College of Liberal Arts (p. 637)

Application may be made upon acceptance to 300-level individual lessons and with permission of the faculty program director.

New Media Communications Minor

New Media Communications (NMC) minor focuses on mediated storytelling and the new media technology that makes it possible. This focus within the broader discipline of mediated communications capitalizes on the historic strengths of Oregon State University. NMC takes an innovative approach to the study of mediated communications. New Media Communications is devoted to the study of mediated communications and its impact on culture, technology and society.

Courses in the New Media Communications minor are designed to prepare students for a variety of careers in media and allied fields in which knowledge of and skills in mediated communications are an integral part of professional activity. NMC offers students the opportunity to pursue a range of theoretical and practical courses in media.

An NMC minor will allow students from across campus to complement their chosen field of study with an understanding of mediated communications from a new media perspective. Students will better understand how to process the information they receive about their chosen field and how to distribute information about their own work effectively in society. The minor in New Media Communications will assist students in attaining the background necessary for leadership roles in their chosen fields.

For more information, contact the New Media Communications Program on 541-737-1492 or newmedia@oregonstate.edu or visit their website (http://liberalarts.oregonstate.edu/school-arts-and-communication/new-media-communications/).

Minor Code: 619

All courses for the New Media Communications minor must be taken for graded credit.

A total of 27–29 credits is required for the minor, at least 15 of which must be upper division (300–400).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMC 101</td>
<td>INTRODUCTION TO NEW MEDIA COMMUNICATIONS</td>
<td>3</td>
</tr>
<tr>
<td>NMC 260</td>
<td>NEW MEDIA FUTURES</td>
<td>3</td>
</tr>
<tr>
<td>NMC 301</td>
<td>*WRITING FOR THE MEDIA PROFESSIONAL</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 18-21 credits from the following (about six courses):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMC 240</td>
<td>SURVEY OF SOCIAL MEDIA</td>
</tr>
<tr>
<td>NMC 255</td>
<td>INTRODUCTION TO SOUND DESIGN</td>
</tr>
<tr>
<td>NMC 320</td>
<td>HISTORY OF TELECOMMUNICATIONS</td>
</tr>
<tr>
<td>NMC 321</td>
<td>HISTORY OF BROADCASTING</td>
</tr>
<tr>
<td>NMC 322</td>
<td>LANDMARKS IN MEDIA CONTENT</td>
</tr>
<tr>
<td>NMC 340</td>
<td>SOCIAL MEDIA STRATEGY</td>
</tr>
<tr>
<td>NMC 351</td>
<td>NEW MEDIA VISUALIZATION</td>
</tr>
<tr>
<td>NMC 355</td>
<td>APPLIED SOUND DESIGN</td>
</tr>
<tr>
<td>NMC 380</td>
<td>PRE-PRODUCTION</td>
</tr>
<tr>
<td>NMC 383</td>
<td>FIELD PRODUCTION</td>
</tr>
<tr>
<td>NMC 399</td>
<td>SPECIAL TOPICS (taken for up to 6 credits)</td>
</tr>
<tr>
<td>NMC 409</td>
<td>PRACTICUM</td>
</tr>
<tr>
<td>NMC 410</td>
<td>INTERNSHIP (taken for up to 6 credits)</td>
</tr>
<tr>
<td>NMC 419</td>
<td>REEFER MADNESS IN THE MEDIA</td>
</tr>
<tr>
<td>NMC 421</td>
<td>DIFFUSION OF INNOVATIONS</td>
</tr>
<tr>
<td>NMC 427</td>
<td>*DIGITAL PORNOGRAPHY</td>
</tr>
<tr>
<td>NMC 430</td>
<td>MEDIA THEORY</td>
</tr>
<tr>
<td>NMC 483</td>
<td>NEW MEDIA 3-D</td>
</tr>
<tr>
<td>NMC 484</td>
<td>NEW MEDIA ANIMATION</td>
</tr>
</tbody>
</table>

Total Hours 27-30

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Photography Minor

The Photography minor creates an opportunity for non-Photography majors to study and practice photography, digital imaging and collaborative digital arts practices. Through the study of a diverse range of photographic genres and techniques, students actively practice photography, develop critical-thinking skills, study the histories of photography and key photographic practitioners, have the option to

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMC 101</td>
<td>INTRODUCTION TO NEW MEDIA COMMUNICATIONS</td>
</tr>
<tr>
<td>NMC 260</td>
<td>NEW MEDIA FUTURES</td>
</tr>
<tr>
<td>NMC 301</td>
<td>*WRITING FOR THE MEDIA PROFESSIONAL</td>
</tr>
</tbody>
</table>

Select 18-21 credits from the following (about six courses):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMC 240</td>
<td>SURVEY OF SOCIAL MEDIA</td>
</tr>
<tr>
<td>NMC 255</td>
<td>INTRODUCTION TO SOUND DESIGN</td>
</tr>
<tr>
<td>NMC 320</td>
<td>HISTORY OF TELECOMMUNICATIONS</td>
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<tr>
<td>NMC 321</td>
<td>HISTORY OF BROADCASTING</td>
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<tr>
<td>NMC 322</td>
<td>LANDMARKS IN MEDIA CONTENT</td>
</tr>
<tr>
<td>NMC 340</td>
<td>SOCIAL MEDIA STRATEGY</td>
</tr>
<tr>
<td>NMC 351</td>
<td>NEW MEDIA VISUALIZATION</td>
</tr>
<tr>
<td>NMC 355</td>
<td>APPLIED SOUND DESIGN</td>
</tr>
<tr>
<td>NMC 380</td>
<td>PRE-PRODUCTION</td>
</tr>
<tr>
<td>NMC 383</td>
<td>FIELD PRODUCTION</td>
</tr>
<tr>
<td>NMC 399</td>
<td>SPECIAL TOPICS (taken for up to 6 credits)</td>
</tr>
<tr>
<td>NMC 409</td>
<td>PRACTICUM</td>
</tr>
<tr>
<td>NMC 410</td>
<td>INTERNSHIP (taken for up to 6 credits)</td>
</tr>
<tr>
<td>NMC 419</td>
<td>REEFER MADNESS IN THE MEDIA</td>
</tr>
<tr>
<td>NMC 421</td>
<td>DIFFUSION OF INNOVATIONS</td>
</tr>
<tr>
<td>NMC 427</td>
<td>*DIGITAL PORNOGRAPHY</td>
</tr>
<tr>
<td>NMC 430</td>
<td>MEDIA THEORY</td>
</tr>
<tr>
<td>NMC 483</td>
<td>NEW MEDIA 3-D</td>
</tr>
<tr>
<td>NMC 484</td>
<td>NEW MEDIA ANIMATION</td>
</tr>
</tbody>
</table>

Total Hours 27-30

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
experience other time-based media genres, and further their photography skills by creating professional-level projects.

The role of photography to improve creative thinking skills is invaluable for students studying in other fields where the role of creativity as an aspect of inventiveness and independent project generation is encouraged. Furthermore, a photography minor is an ideal companion to students majoring in the design fields or in Digital Communication Arts students in these areas already share several courses in common with art/photography students.

To qualify as a Photography minor, students must declare the minor when filing the application for graduation, and must have 27 credits in photography and art history, at least 12 of which must be upper division. For further information, please contact the academic advisor.

**Minor Code: 893**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 263</td>
<td>DIGITAL PHOTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>ART 340</td>
<td>DARKROOM PHOTOGRAPHY I</td>
<td>4</td>
</tr>
<tr>
<td>ART 345</td>
<td>INTERMEDIATE PHOTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>ART 347</td>
<td>PHOTOGRAPH: STUDIO LIGHTING</td>
<td>4</td>
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</tbody>
</table>

**Electives**

Select 11 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 222</td>
<td>INTRODUCTION TO TIME-BASED ART</td>
<td></td>
</tr>
<tr>
<td>ART 264</td>
<td>*PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART</td>
<td></td>
</tr>
<tr>
<td>ART 339</td>
<td>PROFESSIONAL PRACTICES FOR ARTISTS</td>
<td></td>
</tr>
<tr>
<td>ART 341</td>
<td>DARKROOM PHOTOGRAPHY II</td>
<td></td>
</tr>
<tr>
<td>ART 346</td>
<td>PHOTO ILLUSTRATION I</td>
<td></td>
</tr>
<tr>
<td>ART 348</td>
<td>CONCEPTS IN DIGITAL IMAGING</td>
<td></td>
</tr>
<tr>
<td>ART 349/NMC 349</td>
<td>VIDEO ART</td>
<td></td>
</tr>
<tr>
<td>ART 350</td>
<td>PHOTOGRAPHY ON ASSIGNMENT</td>
<td></td>
</tr>
<tr>
<td>ART 354</td>
<td>ALTERNATIVE PROCESSES IN PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 359</td>
<td>*PHOTOGRAPHY: ACTIVISM, AND SOCIAL CHANGE</td>
<td></td>
</tr>
<tr>
<td>ART 368</td>
<td>*HISTORY OF PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 409</td>
<td>PRACTICUM STUDENT MEDIA (repeatable up to 4 credits)</td>
<td></td>
</tr>
<tr>
<td>ART 422</td>
<td>NEW MEDIA: INTERACTIVE</td>
<td></td>
</tr>
<tr>
<td>ART 432</td>
<td>*GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE</td>
<td></td>
</tr>
<tr>
<td>ART 441</td>
<td>PHOTOGRAPHY III</td>
<td></td>
</tr>
<tr>
<td>ART 443</td>
<td>COMBINED MEDIA: PHOTO INSTALLATION</td>
<td></td>
</tr>
<tr>
<td>ART 444</td>
<td>THE CONSTRUCTED IMAGE</td>
<td></td>
</tr>
<tr>
<td>ART 446</td>
<td>DOCUMENTARY PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 447</td>
<td>ADVANCED STUDIO LIGHTING</td>
<td></td>
</tr>
<tr>
<td>ART 454</td>
<td>ALTERNATIVE PROCESSES IN PHOTOGRAPHY II</td>
<td></td>
</tr>
<tr>
<td>ART 456</td>
<td>PORTFOLIO-PHOTOGRAPHY/VIDEO ART (Repeatable to 8 credits)</td>
<td></td>
</tr>
<tr>
<td>NMC 383</td>
<td>FIELD PRODUCTION</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 27

* Baccalaureate Core Course (BCC)

**Minor Code: 253**

The online Popular Music Studies minor, offered only via Ecampus, creates an opportunity for students to examine popular music as a cultural and social practice. The minor provides students with literacy in several popular music genres of their choice, including rock n' roll, hip hop, film music, reggae, Broadway music, music technology and jazz. Through the study of a diverse range of genres, stylistic practices, performance media, and music as a commercial enterprise, students will develop analytical and critical skills to examine musical meaning through the lens of community, music production, and identity.

This minor does not require an audition or ability to read music.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 102</td>
<td>*MUSIC APPRECIATION II: PERIODS AND GENRES (Hip Hop and Rock)</td>
<td>12</td>
</tr>
<tr>
<td>MUS 102</td>
<td>*MUSIC APPRECIATION II: PERIODS AND GENRES (Film Music Theory and Practice)</td>
<td></td>
</tr>
<tr>
<td>MUS 102</td>
<td>*MUSIC APPRECIATION II: PERIODS AND GENRES (Musical Theater)</td>
<td></td>
</tr>
<tr>
<td>MUS 102</td>
<td>*MUSIC APPRECIATION II: PERIODS AND GENRES (Rock and Roll)</td>
<td></td>
</tr>
<tr>
<td>MUS 102</td>
<td>*MUSIC APPRECIATION II: PERIODS AND GENRES (Jazz)</td>
<td></td>
</tr>
<tr>
<td>MUS 102</td>
<td>*MUSIC APPRECIATION II: PERIODS AND GENRES (Reggae)</td>
<td></td>
</tr>
<tr>
<td>MUS 103</td>
<td>*MUSIC APPRECIATION III: GREAT COMPOSERS (The Beatles)</td>
<td></td>
</tr>
<tr>
<td>MUS 103</td>
<td>*MUSIC APPRECIATION III: GREAT COMPOSERS (Bob Marley [Reggae])</td>
<td></td>
</tr>
<tr>
<td>MUS 103</td>
<td>*MUSIC APPRECIATION III: GREAT COMPOSERS (Bob Dylan [Folk])</td>
<td></td>
</tr>
<tr>
<td>MUS 103</td>
<td>*MUSIC APPRECIATION III: GREAT COMPOSERS (Madonna and Video Culture)</td>
<td></td>
</tr>
<tr>
<td>MUS 108</td>
<td>*MUSIC CULTURES OF THE WORLD</td>
<td></td>
</tr>
</tbody>
</table>

**Upper-Division**

Select 15 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 402</td>
<td>INDEPENDENT STUDY</td>
<td>15</td>
</tr>
<tr>
<td>MUS 410</td>
<td>INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>MUS 442</td>
<td>GENRE STUDIES (Advanced Studies in Popular Music Theory and Practice)</td>
<td></td>
</tr>
<tr>
<td>MUS 442</td>
<td>GENRE STUDIES (Women in Popular Music)</td>
<td></td>
</tr>
<tr>
<td>MUS 442</td>
<td>GENRE STUDIES (Advanced Studies in Hip Hop)</td>
<td></td>
</tr>
<tr>
<td>MUS 442</td>
<td>GENRE STUDIES (Regional Studies in World Popular Music [India, Indonesia, Africa, Latin America])</td>
<td></td>
</tr>
<tr>
<td>MUS 442</td>
<td>GENRE STUDIES (Advanced Studies in Rock and Roll)</td>
<td></td>
</tr>
<tr>
<td>MUS 442</td>
<td>GENRE STUDIES (The Blues and African American Music)</td>
<td></td>
</tr>
<tr>
<td>MUS 443</td>
<td>THEORY AND COMPOSITION STUDIES (Advanced Studies in Film and Gaming Music)</td>
<td></td>
</tr>
<tr>
<td>MUS 493</td>
<td>BASIC RECORDING TECHNIQUES</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 27

* Baccalaureate Core Course (BCC)
Scientific, Technical, and Professional Communication Certificate

The undergraduate certificate in Scientific, Technical, and Professional Communication is an interdisciplinary program offered by the School of Writing, Literature and Film and the School of Arts and Communication.

The core consists of courses in writing, communications, and new media arts. These courses are production-oriented and focused on writing and communication skills that students will transfer into other work. Electives are divided between course work in these and other fields, including one course from the Writing Intensive Curriculum (WIC) and up to six credits in upper-division courses in writing and communication. The program is capped by a one-credit course (face-to-face and Ecampus) focused on the creation of a portfolio of technical and scientific communication materials that will be valuable for students as they begin their careers.

Certificate Code: C750

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 362</td>
<td>*SCIENCE WRITING</td>
<td>3</td>
</tr>
</tbody>
</table>

Core Courses
Select at least 12 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
</tr>
<tr>
<td>COMM 316</td>
<td>ADVANCED PERSUASION</td>
</tr>
<tr>
<td>COMM 322</td>
<td>SMALL-GROUP PROBLEM SOLVING</td>
</tr>
<tr>
<td>COMM 324</td>
<td>COMMUNICATION IN ORGANIZATIONS</td>
</tr>
<tr>
<td>COMM 326</td>
<td>INTERCULTURAL COMMUNICATION</td>
</tr>
<tr>
<td>NMC 240</td>
<td>SURVEY OF SOCIAL MEDIA</td>
</tr>
<tr>
<td>NMC 260</td>
<td>NEW MEDIA FUTURES</td>
</tr>
<tr>
<td>WR 201</td>
<td>*WRITING FOR MEDIA</td>
</tr>
<tr>
<td>WR 214</td>
<td>*WRITING IN BUSINESS</td>
</tr>
<tr>
<td>WR 301</td>
<td>*PUBLISHING AND EDITING</td>
</tr>
<tr>
<td>WR 303</td>
<td>*WRITING FOR THE WEB</td>
</tr>
<tr>
<td>WR 330</td>
<td>*UNDERSTANDING GRAMMAR</td>
</tr>
</tbody>
</table>

Writing Intensive Course
Select one WIC course preferably from the primary discipline and major program of study

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 435</td>
<td>SCIENTIFIC, TECHNICAL, &amp; PROFESSIONAL COMMUNICATION CAPSTONE</td>
</tr>
<tr>
<td>WR 435</td>
<td>SCIENTIFIC, TECHNICAL, &amp; PROFESSIONAL COMMUNICATION CAPSTONE (Ecampus)</td>
</tr>
</tbody>
</table>

Total Hours 30-31

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Certificate Code: C750

Speech Communication Graduate Minor

Graduate Areas of Concentration
Interpersonal and group communication; rhetoric and social influence; theatre arts costume and scene design; theatre arts directing, performance, and management; theatre arts history, criticism/literature, and playwriting

Minor Code: 9850

Minor Code: 9850

Speech Communication Undergraduate Major (BA, BS, HBA, HBS)

Students majoring in Speech Communication must choose between a Communication option and a Theater Arts option. Both options function as stand-alone majors.

The Communication option consists of 48 credits of course work. Students who choose the Communication option will be required to satisfactorily complete an undergraduate prerequisite core before applying (through the School of Arts and Communication) to the major. Students who are working on completing the prerequisite core are placed in the Pre-Communication major (major code 979).

The Theater Arts option consists of 51 credits of course work. Students in theater arts do not need to complete the undergraduate prerequisite core required in the Communication option. The course requirements for students pursuing a Theatre Arts option are held to a minimum with the intention of allowing the student and their faculty advisor to devise a program most suited to the student’s specific needs and objectives.

Major Code: 985

Students pursuing the bachelor’s degree in Speech Communication must successfully complete the following requirements:

- Communication option (48 credits) or Theater Arts option (51 credits);
- College of Liberal Arts Core requirements (15 credits);
- Oregon State University Baccalaureate Core (48 credits);
- Oregon State University requirements for the BA or BS;
- Total credits required for graduation is 180.

Major Code: 985
**Communication Option**

*This option is offered within the following major(s):*

- Speech Communication - College of Liberal Arts (p. 641)

The Communication option in the School of Arts and Communication consists of 48 credits. The undergraduate prerequisite core must be successfully completed before the student applies to the major through the School of Arts and Communication. Until then, students are placed in the Pre-Communication major (major code 979).

**Option Code: 983**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td><em>PUBLIC SPEAKING</em></td>
<td>3</td>
</tr>
<tr>
<td>COMM 114</td>
<td><em>ARGUMENT AND CRITICAL DISCOURSE</em></td>
<td>3</td>
</tr>
<tr>
<td>COMM 218</td>
<td><em>INTERPERSONAL COMMUNICATION</em></td>
<td>3</td>
</tr>
</tbody>
</table>

Writing I and Writing II requirements of the baccalaureate core

A cumulative GPA of 2.00 or better

**Communication Option**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 320</td>
<td>INTRODUCTION TO RHETORICAL THEORY</td>
<td>3</td>
</tr>
<tr>
<td>COMM 321</td>
<td>INTRODUCTION TO COMMUNICATION THEORY</td>
<td>3</td>
</tr>
</tbody>
</table>

**Rhetorical Theory**

Select one of the following: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 418</td>
<td><em>INTERPERSONAL COMMUNICATION THEORY AND RESEARCH</em></td>
<td></td>
</tr>
<tr>
<td>COMM 422</td>
<td><em>SMALL-GROUP COMMUNICATION THEORY AND RESEARCH</em></td>
<td></td>
</tr>
<tr>
<td>COMM 426</td>
<td>INTERCULTURAL COMMUNICATION: THEORIES AND ISSUES</td>
<td></td>
</tr>
<tr>
<td>COMM 430</td>
<td>THEORETICAL ISSUES IN COMMUNICATION INQUIRY</td>
<td></td>
</tr>
<tr>
<td>COMM 440</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
<td></td>
</tr>
</tbody>
</table>

**Performance studies courses** 21

**Total Hours** 51

* Baccalaureate Core Course (BCC)

**Limitations:**
- Only 3 credits maximum of lower-division courses will be allowed for the elective portion of this option.
- Only 6 credits maximum of variable credit course work will apply to this option.

**Option Code: 983**

**Theater Arts Option**

*This option is offered within the following major(s):*

- Speech Communication - College of Liberal Arts (p. 641)

Through the Degree Partnership Program (dual admission/enrollment) with Linn-Benton Community College, the Theatre Arts program at Oregon State University is building closer ties with LBCC's drama program. As this innovative program grows, theatre students from both schools will have more performance and production opportunities with greater access to a variety of performance venues and theatre faculty.

**Option Code: 987**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA 147</td>
<td><em>INTRODUCTION TO THE THEATRE</em></td>
<td>3</td>
</tr>
<tr>
<td>TA 244</td>
<td>SCENE CRAFTS</td>
<td>3</td>
</tr>
<tr>
<td>TA 247</td>
<td>STAGE MAKEUP</td>
<td>3</td>
</tr>
<tr>
<td>TA 248</td>
<td>FUNDAMENTALS OF ACTING I</td>
<td>3</td>
</tr>
<tr>
<td>TA 344</td>
<td>PLAYSCRIPT ANALYSIS</td>
<td>3</td>
</tr>
</tbody>
</table>

History/Theory/Criticism courses 15

**Total Hours** 51

* Baccalaureate Core Course (BCC)

In addition to course work, all majors must work on a production crew, act in a production, and serve in a front-of-house position.

**Option Code: 987**

**Studio Art Minor**

*Minor Code: 748*

Art minors may not elect to take required art courses on an S/U graded basis. Studio Art courses in an approved program that includes at least 12 credits of upper-division courses from the following list (15 credits). Studio Art can be any combination of courses in drawing, painting, printmaking, sculpture, expanded media, photography, and digital studio.

A relevant 200-level studio art class is a prerequisite for many of these upper-division courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 115</td>
<td>2-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 117</td>
<td>3-D CORE STUDIO</td>
<td>4</td>
</tr>
<tr>
<td>ART 131</td>
<td>DRAWING CORE STUDIO</td>
<td>4</td>
</tr>
</tbody>
</table>

**Studio Art Courses**

Select 15 credits from the following: 15

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 215</td>
<td>COLOR IN THE VISUAL ARTS</td>
<td></td>
</tr>
<tr>
<td>ART 222</td>
<td>INTRODUCTION TO TIME-BASED ART</td>
<td></td>
</tr>
<tr>
<td>ART 234</td>
<td>DRAWING II/FIGURE</td>
<td></td>
</tr>
<tr>
<td>ART 263</td>
<td>DIGITAL PHOTOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>ART 271</td>
<td>PRINTMAKING I</td>
<td></td>
</tr>
</tbody>
</table>
School of History, Philosophy, and Religion

History

The School of History, Philosophy, and Religion offers a BA or BS degree in History. Courses provide fundamental background for the social sciences and humanities and are of special value to students of government, education, law, science, journalism, and business. History majors go on to careers in teaching and many jobs benefiting from a liberal arts background.

BA candidates must have proficiency at the second-year college level of a foreign language.

The school also offers a minor program for undergraduates with majors in other fields.

Philosophy

The School of History, Philosophy, and Religion offers a BA or BS degree in Philosophy, a Philosophy minor, an undergraduate and postbaccalaureate certificate in Applied Ethics, an MA or MS in Applied Ethics, and participates in the Master of Arts in Interdisciplinary Studies (MAIS) program with a focus on applied ethics and other areas of philosophy. The school's Program for Ethics, Science, and the Environment (PESE) supports multidisciplinary education and scholarship on ethical and policy issues that are raised by advances in scientific knowledge, biotechnology, and natural resource use.

The Spring Creek Project seeks to bring together the practical wisdom of the environmental sciences, the clarity of philosophical analysis, and the creative, expressive power of the written word, to find new ways to understand and re-imagine our relation to the natural world.

Baccalaureate core courses are taught for students interested in broadening their intellectual horizons, developing their abilities for intellectual criticism, and enlarging their understanding of social, ethical, religious, political, and aesthetic values in contemporary society and world cultures. Many philosophy courses have content that is relevant to the interests of women and minority students.

The school invites non-majors to combine the study of philosophy with their major program by enrolling in the philosophy minor or the Applied Ethics certificate program.

Students interested in philosophy programs should contact or visit the school's undergraduate advisor or director of graduate studies.

History of Science

The School of History, Philosophy, and Religion offers the degrees of Master of Arts (MA), Master of Science (MS) and Doctor of Philosophy (PhD) in History of Science. The History of Science graduate program provides professional training in the interdisciplinary subject of the history of science. The program connects the humanities, social sciences, and natural sciences by studying and interpreting the development of the sciences within particular historical settings and analyzing the changing roles of the sciences within modern cultures. The emphasis in the program is on scientific traditions since the sixteenth century in Europe and North America, in the physical, earth, biological, medical, and social sciences, as well as on environmental history and the history of the environmental sciences.
MA or MS in Applied Ethics Degree

The MA or MS in Applied Ethics provides students skills in moral reasoning and an understanding of the ethical values and dilemmas in today's world. Students will be able to identify, analyze and suggest solutions to ethical problems that arise in their professional and civic lives.

MAIS Degree

The school also participates in the Master of Arts in Interdisciplinary Studies (MAIS) degree program. In other advanced degree programs, philosophy may be used as a minor. See the graduate section of this catalog for details.

Undergraduate Programs

Majors
- History (p. 677)
- Philosophy (p. 679)
- Religious Studies (p. 680)

Minors
- History (p. 676)
- Military History (p. 678)
- Philosophy (p. 679)
- Religious Studies (p. 680)

Certificates
- Applied Ethics (p. 674)
- Medical Humanities (p. 677)
- Peace Studies (p. 678)

Graduate Programs

Majors
- Applied Ethics (p. 675)
- History of Science (p. 676)

Minors
- Applied Ethics (p. 675)
- History (p. 675)
- History of Science (p. 676)
- Philosophy (p. 679)

Nicole von Germeten, Director
Stacey Smith, Associate Director, History
Jonathan Kaplan, Associate Director, Philosophy
Courtney Campbell, Associate Director, Religious Studies
Suzanne Giftai, Assistant to the Director
David Bishop, Head Advisor

322 Milam Hall
Oregon State University
Corvallis, OR 97331-3902
Phone: 541-737-3421
Email: david.bishop@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/shpr (http://liberalarts.oregonstate.edu/shpr/)

Faculty

Professors: Campbell, Carson, Clough, Ferngren, Hamblin, Kaplan, Katz, Kopperman, Leibowitz, Oroso, von Germeten
Associate Professors: Chappell, Figueroa, Ip, Koehlinger, Mutschler, Nichols, Oroso, Ritzheimer, Sarbacker, Smith, Thompson
Assistant Professors: Barstow, Hogg, Jenkins, Lauer, Osterloh

Environmental Arts and Humanities

EAH 411. **PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES. (4 Credits)
Introduction to methods of inquiry in the field of environmental arts and humanities. Students will learn key concepts in approaches to environmental humanities scholarship and environmental art, informed by ecological principles and other perspectives from the natural sciences. Disciplinary approaches include history, literature, philosophy, and the formal arts. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC

EAH 412. **ENVIRONMENTAL SCIENCE IN CONTEXT. (4 Credits)
Introduction to environmental science methods and practice, especially for students studying in the arts and humanities. Students will gain a working understanding of the scientific method, theory, and analysis, including how to interpret and evaluate risk assessment, statistics-based arguments, and visual representations of data. Students will also gain an understanding of the history and role of the sciences in environmental discourse. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC

EAH 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

EAH 503. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

EAH 505. READING AND CONFERENCE. (1-4 Credits)
Graded P/N.
This course is repeatable for 4 credits.

EAH 506. FIELD COURSE PROJECTS. (3 Credits)

EAH 507. SEMINAR. (2-4 Credits)
This course is repeatable for 10 credits.

EAH 508. PROFESSIONAL DEVELOPMENT WORKSHOP. (1 Credit)
Graded P/N.
This course is repeatable for 6 credits.

EAH 510. WORK AND FIELD EXPERIENCE. (1-4 Credits)
Graded P/N.
This course is repeatable for 8 credits.

EAH 511. PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES. (4 Credits)
Introduction to methods of inquiry in the field of environmental arts and humanities. Students will learn key concepts in approaches to environmental humanities scholarship and environmental art, informed by ecological principles and other perspectives from the natural sciences. Disciplinary approaches include history, literature, philosophy, and the formal arts.
EAH 512. ENVIRONMENTAL SCIENCE IN CONTEXT. (4 Credits)
Introduction to environmental science methods and practice, especially for students studying in the arts and humanities. Students will gain a working understanding of the scientific method, theory, and analysis, including how to interpret and evaluate risk assessment, statistics-based arguments, and visual representations of data. Students will also gain an understanding of the history and role of the sciences in environmental discourse.

EAH 599. SPECIAL TOPICS. (4 Credits)
This course is repeatable for 12 credits.

History

HST 101. *HISTORY OF WESTERN CIVILIZATION. (4 Credits)
Provides an awareness and understanding of the Western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the Western tradition. Covers the Ancient World to 1000 A.D. HST 101, HST 102 and HST 103 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 101H

HST 102. *HISTORY OF WESTERN CIVILIZATION. (4 Credits)
Provides an awareness and understanding of the Western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the Western tradition. Covers 1000 A.D. to 1789. HST 101, HST 102 and HST 103 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 102H

HST 103. *HISTORY OF WESTERN CIVILIZATION. (4 Credits)
Provides an awareness and understanding of the Western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the Western tradition. Covers 1789 to the present. HST 101, HST 102 and HST 103 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 103H

HST 104. *WORLD HISTORY I: ANCIENT CIVILIZATIONS. (3 Credits)
A survey of the historical development of several world civilizations from antiquity to roughly 600 to 700 A.D. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

HST 105. *WORLD HISTORY II: MIDDLE AND EARLY MODERN AGES. (3 Credits)
A survey of the historical development of several world civilizations roughly from the 8th century to the late 18th century. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 105H

HST 106. *WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD. (3 Credits)
A survey of the historical development of several world civilizations from the 18th century to the contemporary period. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 106H

HST 106H. *WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD. (3 Credits)
A survey of the historical development of several world civilizations from the 18th century to the contemporary period. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 106H

HST 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

HST 201. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the United States from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers pre-Columbian and colonial origins to 1820. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 201H
HST 201H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers pre-Columbian and colonial origins to 1820. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 201

HST 202. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1820 to 1920. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 202H

HST 202H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1820 to 1920. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 202

HST 203. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1920 to present. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 203H

HST 203H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1920 to present. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 203

HST 210. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210H, PHL 210, PHL 210H, REL 210

HST 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210H, PHL 210, PHL 210H, REL 210

HST 215. *INTRODUCTION TO JEWISH TRADITIONS. (4 Credits)
An introduction to Judaism's traditions, histories, and practices. Covers historical origins and developments from the biblical period through the Middle Ages, and considers Judaism in the modern world. Topics include the Jewish calendar (including holidays and their traditions), Jewish life cycle events, Jewish prayer, and traditional texts such as the Mishnah and Talmud. CROSSLISTED as HST 215/REL 215. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: REL 215

HST 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HST 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HST 299
This course is repeatable for 16 credits.

HST 310. THE HISTORIAN’S CRAFT. (4 Credits)
A study of the practice as well as theory of historical work. Combines training in reading, writing, and thinking historically with a survey of the development of history, philosophies of history, types and use of historical evidence, varieties of historical investigation, and factors that influence the writing of history. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 420
Recommended: 9 credits of history or upper-division standing.

HST 315. THE EUROPEAN MILITARY, 1400-1815. (4 Credits)
Major aspects of European military history, 1400-1815, notable developments in weaponry and strategy, the social history of the military, impact of war on the civilian front, and pacifism and antimilitarism. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 316. THE AMERICAN MILITARY, 1607-1865. (4 Credits)
Major aspects of American military history, 1607-1865, notable developments in weaponry and strategy, the social history of the military, impact of war on the civilian front, and pacifism and antimilitarism. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 317. *WHY WAR: A HISTORICAL PERSPECTIVE. (4 Credits)
An inquiry into the origins of mass violence. Theory and case studies are used to suggest possible causes of international war, civil war, revolution, and genocide. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 317H
HST 317H. *WHY WAR: A HISTORICAL PERSPECTIVE.* (4 Credits)
An inquiry into the origins of mass violence. Theory and case studies are used to suggest possible causes of international war, civil war, revolution, and genocide. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 317

HST 318. THE AMERICAN MILITARY, 1865-PRESENT. (4 Credits)
Major aspects of American military history, 1865-present: evolution of strategy, tactics, and technology in war; the impact of the military on American society in peace and war; historiographic aspects of U.S. military history. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 319. *THE HISTORY OF HUMAN RIGHTS IN THE MODERN WORLD.* (4 Credits)
Historical examination of the articulations, development, and enforcement of human rights in a global context since the 1770s. Particular attention devoted to nineteenth-century transnational humanitarian missions, wartime codes of conduct, international war crimes tribunals, European imperialism and decolonization, twentieth-century genocide, the International Criminal Court, the United Nations’ “Universal Declaration of Human Rights” (UDHR), and the legacy of the UDHR. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

HST 320. *ANCIENT NEAR EAST.* (4 Credits)
A detailed survey of the peoples and cultures of the ancient Near East, including Assyria, Babylon, Egypt, Israel, Mesopotamia, and Persia, from the earliest recorded beginnings of civilization to about 500 B.C. Particular attention is given to the art, religion, law, and literature of these civilizations. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 321. GREECE. (4 Credits)
The history of the Greek city-states and the civilization they produced; the archaeological discovery of early Greece; the development of the polis; Sparta, Athenian democracy, the Persian and Peloponnesian Wars; Greek private life and religion. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 322. ROMAN REPUBLIC. (4 Credits)
The rise of Rome from a city-state to a world power, Rome’s wars with Carthage, her growing domination of the Mediterranean, the ensuing breakdown of Roman society and traditional values, and the rise of ambitious leaders who ultimately destroyed the Republic. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 323. ROMAN EMPIRE. (4 Credits)
Roman history from 31 B.C. to A.D. 493. The establishment of the Principate, Roman social and private life, the rise of Christianity, the decline and fall of the Western Empire, Rome’s contributions to arts, religion, and law. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 324. *ANCIENT JEWISH HISTORY.* (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 324H, REL 324, REL 324H

HST 324H. *ANCIENT JEWISH HISTORY.* (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: HST 324, REL 324, REL 324H

HST 325. *EARLY CHRISTIANITY: ORIGINS TO 600.* (4 Credits)
Traces early Christianity from its origins to the beginning of the Middle Ages. It deals with the origins and Jewish background of Christianity in Palestine, the ministry and teachings of Jesus, the spread of Christianity throughout the Roman Empire by his disciples and early missionaries, the formation of the New Testament canon, the development of Christian doctrine, controversies over heresy, and the origin of monasticism and the Papacy. CROSSLISTED as HST 325/REL 325. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: REL 325

HST 326. *HISTORY OF CHRISTIANITY.* (4 Credits)
Examines the history of global Christianity from the fifth through the seventeenth centuries. Themes to be investigated include the evolving relationship between the church and the state; mysticism; conversion and resistance; the emergence of Protestantism; marriage and sex, as well as women in the history of Christianity. CROSSLISTED as HST 326/REL 326.
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: REL 326

HST 327. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Covers the history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 284 A.D. to 1000. Not offered every year. CROSSLISTED as HST 327/REL 327. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 327

HST 328. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Covers the history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 1000 to 1400. Not offered every year. CROSSLISTED as HST 328/REL 328. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 328

HST 329. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the Renaissance. HST 329, HST 330, and HST 331 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 330. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the Reformation. Not offered every year. CROSSLISTED as HST 330/REL 330. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 330

HST 331. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the scientific revolution. HST 329, HST 330, and HST 331 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
HST 333. MEDIEVAL AND EARLY MODERN SPANISH HISTORY. (4 Credits)
From Islamic conquest to conquest of America, the social, religious, political and economic history of Spain from 1000 to 1700. Offered fall term in odd years. CROSSLISTED as HST 333/REL 333. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 333

HST 335. *NINETEENTH-CENTURY EUROPE. (4 Credits)
A thematic overview of the ‘long’ nineteenth century, from the French Revolution (1789) to the outbreak of the first World War (1914); the industrial revolution and the class struggles that accompanied it; the growing importance of the nation in politics and culture; imperial expansion and Europeans’ contacts with non-Europeans; urbanization; Darwinism and Social Darwinism; and the developments leading to the cataclysm of Europe’s first ‘modern’ war. Not offered every year. (H) (Bacc Core Course)
Attributes: LACH – Liberal Arts Humanities Core

HST 336. TWENTIETH-CENTURY EUROPE. (4 Credits)
Examines the politics, culture, and society of Europe from World War I to the present. Themes include total war; ways that art and literature influenced politics; communist and fascist visions of the relationship of the individual to the society or collective; racial theories and genocide; the cold war division of Europe into East and West; decolonization; and the development of the European Community. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 338. *HITLER'S EUROPE. (4 Credits)
Examines WWII and Nazi Germany’s efforts to construct an empire. Themes include: the Nazi Party’s rise to power in 1933 and pursuit of war, battles and occupation policies in Western and Eastern Europe, anti-Semitism and the concept of Lebensraum, collaboration among occupied peoples and Germans, and the Holocaust. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

HST 340. HISTORY OF RUSSIA. (4 Credits)
Survey of political, economic, and social developments from the origin of Russia to the post-Soviet period. Focuses on the period from 862 to 1917. Not offered every year. HST 340 and HST 341 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 440, HST 540

HST 341. HISTORY OF RUSSIA. (4 Credits)
Survey of political, economic, and social developments from the origin of Russia to the post-Soviet period. Focuses on the period from 1917 to the present. Not offered every year. HST 340 and HST 341 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 441, HST 541

HST 344. SPECIAL TOPICS IN RUSSIAN HISTORY. (4 Credits)
Special topics and problems in Russian history not covered in other courses. May be repeated when topic varies. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits

HST 345. SOCIETY IN MODERN RUSSIA. (4 Credits)
Development of Russian/Soviet/Post-Soviet society since 1861, focusing on gender, urbanization, and the general social ramifications of modernization. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 445, HST 545

HST 348. *INDIGENOUS HISTORY OF LATIN AMERICA. (4 Credits)
Dedicated to studying the indigenous histories of Mexico, Central, and South America from 2000 BCE to 1600 CE through their own voices with an emphasis on religion, gender, and society. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity

HST 350. *MODERN LATIN AMERICA. (4 Credits)
History of Latin America leading up to and after Spanish and Portuguese conquest. Focus on indigenous American, European and African cultures and religions in contact under colonial government and economic systems. Covers the period from 1400 to 1810. CROSSLISTED as HST 350/REL 350. (H) (NC) (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 350H, REL 350

HST 351. *MODERN LATIN AMERICA. (4 Credits)
History of the development of Latin America, emphasizing the issues of imperialism, economic dependency, social stratification, political instability, and nationalism within an international context. Covers 1850 to the present. (H) (NC) (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity

HST 352. *AFRICANS IN LATIN AMERICAN HISTORY. (4 Credits)
A survey of the role of Africans and their descendants in Latin American history, linking the history of the Americas, Europe and Africa. CROSSLISTED as HST 352/REL 352. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity
Equivalent to: REL 352
Recommended: HST 350 and HST 351

HST 353. *SLAVERY IN THE AMERICAS. (4 Credits)
A survey of the roles of Africans and their descendants in the history of the Atlantic World, linking Europe, Africa, and the Americas. Examines slavery and freedom in the African Diaspora, as well as social, cultural, and spiritual life. CROSSLISTED as HST 353/REL 353. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity

HST 362. WOMEN IN UNITED STATES HISTORY. (4 Credits)
Women in the United States—their roles in and contribution to American political, economic, social, cultural, and intellectual life. Course sequence pays particular attention to the diversity of American women’s backgrounds and experiences. Covers 1620 to 1890. Not offered every year. HST 362 and HST 363 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
HST 363. WOMEN IN UNITED STATES HISTORY. (4 Credits)
Women in the United States--their roles in and contribution to American political, economic, social, cultural, and intellectual life. Course sequence pays particular attention to the diversity of American women's backgrounds and experiences. Covers 1890 to the present. Not offered every year. HST 362 and HST 363 need not be taken in sequence. (H) Attributes: LACH – Liberal Arts Humanities Core

HST 364. *UNITED STATES RELIGION AND SOCIAL REFORM. (4 Credits)
Provides an awareness of how various religious groups have thought about and engaged with social change pertaining to slavery, feminism, civil rights, same-sex marriage, and immigration. Focus on reading primary sources related to each of these issues. CROSSLISTED as HST 364/REL 364. (Bacc Core Course) Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator

HST 365. *THE CIVIL RIGHTS MOVEMENT IN THE MODERN U.S.. (4 Credits)
An exploration of the 'long civil rights movement' among African Americans and their allies during the 20th century United States, with attention to the structure of racial inequality, movement philosophies and strategies, white allies and opponents, relationships to other freedom movements, and the movement's legacies. (Bacc Core Course) Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CROSSLISTED as HST 365H

HST 365H. *THE CIVIL RIGHTS MOVEMENT IN THE MODERN U.S.. (4 Credits)
An exploration of the 'long civil rights movement' among African Americans and their allies during the 20th century United States, with attention to the structure of racial inequality, movement philosophies and strategies, white allies and opponents, relationships to other freedom movements, and the movement's legacies. (Bacc Core Course) Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator

HST 366. *NATIVE NORTH AMERICA. (4 Credits)
Explores the history, culture, and representation of various Native American groups from the pre-Columbian era to the twenty-first century. Through a range of interdisciplinary readings and media, students will explore themes like the construction and maintenance of cultural identity, politics and warfare between indigenous groups and European or American interlopers, the influence of Native economies, and Native groups' persistence in American life amidst ongoing economic and demographic change. (Bacc Core Course) Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

HST 368. *LESBIAN AND GAY MOVEMENTS IN MODERN AMERICA. (4 Credits)
Examination of lesbian and gay male identities, lives, and collectivities in American culture from the post-Civil War period to the present. The political and cultural participation, rather than human sexual behaviors, orientations, or values. Not offered every year. (H) Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

HST 369. **IMMIGRATION TO THE U.S. SINCE 1880. (4 Credits)
The history of immigrants to the U.S. after 1880. Focuses on the experience of immigrants and their children in the U.S. and on the history of U.S. immigration policy. Includes several types of writing assignments: nongraded, drafts and revisions, and a research paper using outside primary and secondary sources and scholarly notations specific to the discipline of history. HST 369 satisfies WIC requirement for Liberal Studies majors but not History majors. (Baccalaureate Core Course) (Writing Intensive Course) Taught via Ecampus only. Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CWIC – Core, Skills, WIC

HST 370. *SOCIAL CHANGE AND AMERICAN POPULAR MUSIC. (4 Credits)
An examination of the interactions between social history and popular music, including creation, performance, production, distribution, and reception. Social, ethnic, and economics groups have notoriously used popular music to identify themselves and their boundaries. This course examines how the functions of popular music in our culture and economy have changed over time, and the ways in which popular music reflects and sometimes helps precipitate social change. (Bacc Core Course) Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CROSSLISTED as HST 370/REL 370/ WGSS 378. (Bacc Core Course) Attributes: CSGI – Core, Synth, Global Issues

HST 371. *GLOBAL HISTORY OF SPORTS. (4 Credits)
Historical and contemporary examination of the ties between global sports and politics, economy, culture, and society. Particular attention devoted to the development of various sports and their modern articulation. Among other, the course deals with these crucial questions: How is 'sports' defined? What led to the development of different sports in different places throughout the world? How are global sports institutions influencing our lives? What are the changes witnessed in consuming sports in the last half a century? How can sports tackle institutionalized racism, but also promote nefarious practices, chauvinism, and exclusion based on ethnicity or religion?. Attributes: CSGI – Core, Synth, Global Issues

HST 378. *RELIGION AND GENDER: A GLOBAL PERSPECTIVE. (4 Credits)
Introduces students to the academic study of religion, as well as the academic study of gender. In order to offer a global perspective, we will read a series of case studies that deal with the religion as a gendered experience. Students will produce two essays, one of which will be based on independent research. CROSSLISTED as HST 378/REL 378/ WGSS 378. (Bacc Core Course) Attributes: CSGI – Core, Synth, Global Issues

HST 381. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Africa before 1830. HST 381 and HST 382 need not be taken in sequence. (H) (NC) (Bacc Core Course) Attributes: CPDC – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 382. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Nineteenth and Twentieth century Africa. (H) (NC) (Bacc Core Course) Attributes: CPDC – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

Equivalent to: HST 382H
HST 382H. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Nineteenth and Twentieth century Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 382

HST 385. *THE ARAB-ISRAELI CONFLICT. (4 Credits)
Examination of the origins of the Arab-Israeli conflict and subsequent efforts to find a lasting solution. (H) (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 385

HST 385H. *THE ARAB-ISRAELI CONFLICT. (4 Credits)
Examination of the origins of the Arab-Israeli conflict and subsequent efforts to find a lasting solution. (H) (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 385

HST 386. *MODERN IRAN: REVOLUTION AND ITS AFTERMATH. (4 Credits)
The history of 20th century Iran with a focus on the Islamic revolution and its consequences. Readings will provide the cultural and political background for understanding contemporary Iran and its place in the world. (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues
Equivalent to: HST 386

HST 386H. *MODERN IRAN: REVOLUTION AND ITS AFTERMATH. (4 Credits)
The history of 20th century Iran with a focus on the Islamic revolution and its consequences. Readings will provide the cultural and political background for understanding contemporary Iran and its place in the world. (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HST 386

HST 387. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 600 to 1400. Early history and the formation of Islamic society to the Mongol invasion. CROSSLISTED as HST 387/REL 387. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: REL 387

HST 388. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 1400 to the present. The expansion of Islam, Turkic, and Asian dynasties, impact of Western imperialism and modern Islamic world. CROSSLISTED as HST 388/REL 388. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: REL 388

HST 390. *MIDEAST WOMEN: IN THEIR OWN WORDS. (4 Credits)
The lives of modern Middle Eastern women as told in memoirs, autobiography and film. First-person narratives and film portrayals provide the means for understanding historical events and contemporary trends in the region. (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues
Equivalent to: HST 390

HST 390H. *MIDEAST WOMEN: IN THEIR OWN WORDS. (4 Credits)
The lives of modern Middle Eastern women as told in memoirs, autobiography and film. First-person narratives and film portrayals provide the means for understanding historical events and contemporary trends in the region. (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HST 390

HST 391. *TRADITIONAL CHINA AND JAPAN. (4 Credits)
Prehistory to Western encounters in the middle of the nineteenth century, with emphasis on the philosophical, artistic heritage, and social institutions of these two countries which form East Asia. HST 391 and HST 392 need not be taken in sequence. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 392. *MODERN CHINA AND JAPAN. (4 Credits)
From the opening of East Asia in the mid-nineteenth century to the present, with emphasis on modern political movements and cultural transformation. HST 391 and HST 392 need not be taken in sequence. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 396. *GENDER, FAMILY AND POLITICS IN TRADITIONAL CHINA. (4 Credits)
Study of the interaction between gender, family and politics as major factors shaping traditional Chinese experience. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 397. *GENDER, FAMILY AND POLITICS IN MODERN CHINA. (4 Credits)
Study of the interaction between gender, family and politics as three factors shaping modern Chinese experience. Elective for history majors. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: HST 399H
This course is repeatable for 16 credits.

HST 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HST 399
This course is repeatable for 16 credits.

HST 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HST 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HST 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HST 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HST 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
HST 407. *SEMINAR. (5 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: HST 407H
This course is repeatable for 20 credits.

HST 407H. *SEMINAR. (5 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: HST 407
This course is repeatable for 20 credits.

HST 410. HISTORY INTERNSHIP. (1-12 Credits)
Supervised work of a historical nature with historical societies, archives, museums, or other public or private organizations. No more than 6 of the maximum 12 credits may be used to satisfy the history major requirement of 51 credits.
This course is repeatable for 12 credits.

HST 415. SELECTED TOPICS. (4 Credits)
Selected topics of special or current interest not covered in other courses. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 415H
This course is repeatable for 99 credits.

HST 415H. SELECTED TOPICS. (4 Credits)
Selected topics of special or current interest not covered in other courses. (H)
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 415
This course is repeatable for 99 credits.

HST 416. *FOOD IN WORLD HISTORY. (4 Credits)
Historical analysis of food and cooking from pre-history to the present, with an emphasis on cross-cultural differences of food production and consumption. (Bacc Core Course) (H)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core

HST 417. *HISTORY OF BEER AND BREWING. (4 Credits)
History of beer and brewing from the beginnings of civilization through the modern microbrewery movement.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HST 421. HELLENISTIC GREECE. (4 Credits)
History of the Greek world from the end of the Peloponnesian War to the Roman conquest of Greece; the careers of Alexander the Great and his successors; the art, literature, science, religion, and philosophy of the post-classical or Hellenistic world. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 422. MEDIEVAL SLAVERY. (4 Credits)
A seminar-style course on the history of slavery from late Rome until the beginning of the Atlantic slave trade. Focuses on both primary sources which shed light on premodern slavery, and on recent scholarly debates, as seen in secondary sources. Through the study of slavery, students will investigate the social and cultural history of the long Middle Ages, including questions of class, religion, economics, gender, race, and law.

HST 425. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425H, REL 425, REL 425H

HST 425H. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425, REL 425, REL 425H

HST 426. WORLD WAR I: A GLOBAL HISTORY. (4 Credits)
Examines World War I from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at Great Britain, France, Russia, Germany and their colonial possessions. Topics will include the concept of total war and the home fronts of a number of nations.
Prerequisites: HST 103 with D- or better

HST 427. TEACHING THE HOLOCAUST. (4 Credits)
Provides a broad sense of the Holocaust; reviews the event itself, its long-term background (the history of anti-Semitism), and the rise of Nazism and Fascism in the years before World War II. Examines what has been learned from the Holocaust and addresses the broader issue of genocide, especially in the 20th century.

HST 428. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts in the European Enlightenment (1715-1789). Not offered every year. HST 428, HST 429, HST 430 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 429. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1890 and 1945. Not offered every year.
HST 428, HST 429, HST 430 need not be taken in sequence.
Attributes: LACH – Liberal Arts Humanities Core

HST 430. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1890 and 1945. Not offered every year.
HST 428, HST 429, HST 430 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 431. *A HISTORY OF CHILDHOOD. (4 Credits)
Examines childhood as a social and historical construct and explores how race, class, gender, and geography have created unequal access to this protected category for individual children and continues to produce inequalities in children's health, education, and access to designated safe spaces. Explores how historical phenomena have impacted children, including colonialism, slavery, revolution, the rise of the modern state, the professionalization of medicine and social work, compulsory education, developing legal concepts about children's rights, the development of consumer mass culture, WWI, WWII, and the Cold War. Traces shifting understandings of the 'normal' child. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
HST 432. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present. (H)
Attributes: LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 432H

HST 432H. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present. (H)
SS
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 432

HST 433. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social and religious developments that have shaped the history of England and ultimately of America and much of the world. Medieval and Tudor-Stuart England. HST 433/HST 533, HST 434/HST 534 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 434. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social and religious developments that have shaped the history of England and ultimately of America and much of the world. England since 1668. HST 433/HST 533, HST 434/HST 534 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 435. THE HISTORY OF EUROPEAN WOMEN FROM 1400 TO 1789. (4 Credits)
Focuses on the social, economic, and cultural roles women in Europe between 1400 and 1789. Topics include Christianity and women, the Renaissance lady, the European witch craze, women rulers, the debate about female intellectual abilities, and the beginning of the campaign for female equality.
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 102 and HST 103

HST 436. HISTORY OF MODERN GERMANY. (4 Credits)
Political, economic, social and intellectual developments from 1815 through the imperial, Weimar, and Nazi eras to the present. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 452. MODERN MEXICO. (4 Credits)
History of Mexico since 1810--economic, political, and social change and relations with the United States. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 350 or HST 351 or upper-division standing.

HST 456. PROBLEMS IN LATIN AMERICAN HISTORY. (4 Credits)
A focused examination of the origins and development of selective institutions and problems important to understanding the region, such as the church, the military, labor, political instability, economic stagnation, and social stratification. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 350 or HST 351 or upper-division standing.

HST 460. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1776 to 1860. Not offered every year. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 461. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1860 to 1930. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 462. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1930 to the present. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 464. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from the nation’s founding to 1898.
HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 465. *AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 465H
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 465H. *AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 465
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.
HST 466. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSTLISTED as HST 466/REL 466 and HST 566/REL 566. Equivalent to: REL 466
Recommended: HST 202 and HST 203 or upper-division standing.

HST 467. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 468. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 469. HISTORY OF THE PACIFIC NORTHWEST. (4 Credits)
The demographic, ecological, and cultural transformation of Oregon, Washington, and Idaho from Indian times to the present. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 470. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSTLISTED as HST 470/REL 470 and HST 570/REL 570. Equivalent to: REL 470

HST 471. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from the English background to 1689. HST 471/HST 571, HST 472/572 need not be taken in sequence. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 472. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from 1689 to 1763. HST 471/HST 571, HST 472/572 need not be taken in sequence. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 473. THE ERA OF THE AMERICAN REVOLUTION. (4 Credits)
The American Revolution, the drafting of the Constitution, and the launching of the new nation, 1763 to 1789. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 474. JEFFERSONIAN AND JACKSONIAN DEMOCRACY. (4 Credits)
American political, economic, religious, and social development during the early and middle national era with emphasis on the formation and growth of political parties, territorial expansion and western settlement, and the beginnings of sectional conflict. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 or upper-division standing.

HST 475. CIVIL WAR AND RECONSTRUCTION. (4 Credits)
Origins of the war, nature of the war, and the critical postwar era, 1830s to 1880s, with special attention to the changing historiography of the period. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 202 or upper-division standing.

HST 477. THE PROGRESSIVE AND NEW DEAL ERAS. (4 Credits)
Twentieth-century U.S. history from 1900 to 1939, with emphasis on political and economic developments; attention given to diplomatic, cultural, and social change. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 203

HST 478. THE U.S. SINCE 1939. (4 Credits)
United States political, cultural, and diplomatic history from the Second World War through the 1970s, with special emphasis on the Cold War at home and abroad. Not offered every year. (H) Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 203 or upper-division standing.

HST 481. ENVIRONMENTAL HISTORY OF THE UNITED STATES. (4 Credits)
A study of human interaction with the environment and the transformation of the landscape and ecology of North America from the Indian period to the present, with special attention to the progressive alterations induced by the modernizing world of agriculture, industry, urbanism, and their relation to the market system in the United States. Not offered every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Recommended: HST 201, HST 202 and HST 203

HST 484. RELIGION AND LAW. (4 Credits)
Theorizes the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western "secular" society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others' laws, and the ways in which modern societies have used law to separate "religion" from the state. CROSSTLISTED as HST 484/REL 484 and HST 584/REL 584. Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 484
HST 485. *POLITICS AND RELIGION IN THE MODERN MIDDLE EAST. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSLISTED as HST 485/REL 485 and HST 585/REL 585. (H) (NC) 
(Bacc Core Course) 
Attributes: CPCD – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core 
Equivalent to: REL 485

HST 486. A HISTORY OF CHRISTIANITY IN AFRICA. (4 Credits)
An investigation of the historical development and changing character of Christianity in Africa. Topics include the examination of the role of Christianity in the development of social identity and politics in historic Ethiopia from the early first millennium CE; Portuguese missionary efforts in Central Africa during the period of the Atlantic slave trade from the 15th to the 18th centuries; the role of 19th century missionaries in both spreading Christianity in Africa and during the European colonization of Africa at the end of the 19th century, the emergence of African independence churches and prophetic Christianity in the 20th century; and the .
Attributes: LACH – Liberal Arts Humanities Core 
Recommended: HST 381 and/or HST 382

HST 487. WORLD WAR II: A GLOBAL HISTORY. (4 Credits)
Examines World War II from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at the US, USSR, Britain, Germany and Japan. Topics will include the concept of total war and the home fronts of a number of nations.
Recommended: HST 103

HST 488. *THE UNITED STATES AND VIETNAM 1945-1995. (4 Credits)
Examines the Vietnam War from both the US and Vietnamese perspective within the context of the Cold War. Political, military, social and moral issues will be covered within the concept of American exceptionalism.
(Bacc Core Course) 
Attributes: CSGI – Core, Synth, Global Issues

HST 490. *ISRAELI SOCIETY AND PLURALISM. (4 Credits)
Overwhelmingly a nation of immigrants, modern Israel displays an extraordinary amount of ethnic and social diversity among the 75% of its citizens who identify as Jews and among the 25% defined as Arab or “other.” By introducing students to Israel’s ethnic, religious, LGBTQ, migrant worker and refugee communities, this course examines the tensions that inform Israel’s efforts to construct a national identity within a multicultural society. Israel aspires to be both liberal democratic and Jewish, secular and religious. As such, it provides an unparalleled case study for investigating how a society negotiates the dynamics of inclusion, exclusion and difference.
Attributes: CSGI – Core, Synth, Global Issues

HST 494. MODERN JAPAN: A CULTURAL HISTORY. (4 Credits)
Japanese history from the Meiji to the contemporary period (1980s/1990s). Examination of Japanese tradition and the Tokugawa period. Investigation of Westernization/modernization, imperialism, national identity, gender, atomic bomb(s), and post-war culture. (H) 
Attributes: LACH – Liberal Arts Humanities Core

HST 495. CHINA IN 20TH CENTURY. (4 Credits)
Treats the decline of the Confucian tradition, shifts in the economy, and metamorphoses of the political system. Attention is given to China’s attempt to balance her Communist revolutionary legacies with her current modernizing goals. (H) (NC) 
Attributes: LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core 
Recommended: HST 391 and HST 392 or upper-division standing.

HST 499. SPECIAL TOPICS. (1-16 Credits)
Supervised readings designed to allow students to explore in depth key issues in Asian history. (H) 
Attributes: LACH – Liberal Arts Humanities Core 
Equivalent to: HST 499H 
This course is repeatable for 16 credits.

HST 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator 
Equivalent to: HST 499 
This course is repeatable for 16 credits.

HST 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HST 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

HST 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HST 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HST 507. SEMINAR. (5 Credits)
PREREQ: Graduate standing. 
This course is repeatable for 20 credits.

HST 510. HISTORY INTERNSHIP. (1-12 Credits)
Supervised work of a historical nature with historical societies, archives, museums, or other public or private organizations. No more than 6 of the maximum 12 credits may be used to satisfy the history major requirement of 51 credits.
This course is repeatable for 12 credits.

HST 511. HISTORIOGRAPHY IN HISTORY. (4 Credits)
Introduces graduate students to the range of scholarship within the literature of history. Reveals the full sweep of history as an academic discipline and the process of its professionalization.

HST 512. METHODOLOGIES OF HISTORY. (4 Credits)
A study of the practice as well as theory of historical work. Combines training in reading, writing, and thinking historically with a survey of the development of history, philosophies of history, types and use of historical evidence, varieties of historical investigation, and factors that influence the writing of history.

HST 514. PUBLIC HISTORY. (4 Credits)
Introduces graduate students to the varied aspects and roles of public history, including cultural resource management, research, and report writing.

HST 515. SELECTED TOPICS. (4 Credits)
Selected topics of special or current interest not covered in other courses. 
This course is repeatable for 16 credits.

HST 516. FOOD IN WORLD HISTORY. (4 Credits)
Historical analysis of food and cooking from pre-history to the present, with an emphasis on cross-cultural differences of food production and consumption.
HST 521. HELLENISTIC GREECE. (4 Credits)
History of the Greek world from the end of the Peloponnesian War to the Roman conquest of Greece; the careers of Alexander the Great and his successors; the art, literature, science, religion, and philosophy of the post-classical or Hellenistic world. Not offered every year.
Recommended: HST 101

HST 522. MEDIEVAL SLAVERY. (4 Credits)
A seminar-style course on the history of slavery from late Rome until the beginning of the Atlantic slave trade. Focuses on both primary sources which shed light on premodern slavery, and on recent scholarly debates, as seen in secondary sources. Through the study of slavery, students will investigate the social and cultural history of the long Middle Ages, including questions of class, religion, economics, gender, race, and law.

HST 525. THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSTIITED as HST 425/REL 425 and HST 525/REL 525.
Equivalent to: REL 525

HST 526. WORLD WAR I: A GLOBAL HISTORY. (4 Credits)
Examines World War I from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at Great Britain, France, Russia, Germany and their colonial possessions. Topics will include the concept of total war and the home fronts of a number of nations.
Recommended: HST 103

HST 527. TEACHING THE HOLOCAUST. (4 Credits)
Provides a broad sense of the Holocaust; reviews the event itself, its long-term background (the history of anti-Semitism), and the rise of Nazism and Fascism in the years before World War II. Examines what has been learned from the Holocaust and addresses the broader issue of genocide, especially in the 20th century.

HST 528. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts in the European Enlightenment (1715-1789). Not offered every year. HST 528, HST 529, HST 530 need not be taken in sequence.

HST 529. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1789 and 1890. Not offered every year. HST 528, HST 529, HST 530 need not be taken in sequence.

HST 530. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1890 and 1945. Not offered every year. HST 528, HST 529, HST 530 need not be taken in sequence.

HST 531. A HISTORY OF CHILDHOOD. (4 Credits)
Examines childhood as a social and historical construct and explores how race, class, gender, and geography have created unequal access to this protected category for individual children and continues to produce inequalities in children's health, education, and access to designated safe spaces. Explores how historical phenomena have impacted children, including colonialism, slavery, revolution, the rise of the modern state, the professionalization of medicine and social work, compulsory education, developing legal concepts about children's rights, the development of consumer mass culture, WWI, WWII, and the Cold War. Traces shifting understandings of the 'normal' child.

HST 532. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present.

HST 533. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social and religious developments that have shaped the history of England and ultimately of America and much of the world. Medieval and Tudor-Stuart England. HST 433/ HST 533, HST 434/HST 534 need not be taken in sequence. Not offered every year.

HST 534. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social and religious developments that have shaped the history of England and ultimately of America and much of the world. England since 1688. HST 433/HST 533, HST 434/ HST 534 need not be taken in sequence. Not offered every year.

HST 535. THE HISTORY OF EUROPEAN WOMEN FROM 1400 TO 1789. (4 Credits)
Focuses on the social, economic, and cultural roles women in Europe between 1400 and 1789. Topics include Christianity and women, the Renaissance lady, the European witch craze, women rulers, the debate about female intellectual abilities, and the beginning of the campaign for female equality.
Recommended: HST 102 or HST 103

HST 536. HISTORY OF MODERN GERMANY. (4 Credits)
Political, economic, social and intellectual developments from 1815 through the imperial, Weimar, and Nazi eras to the present. Not offered every year.

HST 552. MODERN MEXICO. (4 Credits)
History of Mexico since 1810–economic, political, and social change and relations with the United States. Not offered every year.
Recommended: HST 350 or HST 351

HST 556. PROBLEMS IN LATIN AMERICAN HISTORY. (4 Credits)
A focused examination of the origins and development of selective institutions and problems important to understanding the region, such as the church, the military, labor, political instability, economic stagnation, and social stratification.
Recommended: HST 350 or HST 351

HST 560. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1776 to 1860. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 561. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1860 to 1930. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 562. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1930 to the present. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 564. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from the nation's founding to 1898. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 565. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 566. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSLISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: REL 566
Recommended: HST 201 and HST 202 and HST 203

HST 567. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 568. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 569. HISTORY OF THE PACIFIC NORTHWEST. (4 Credits)
The demographic, ecological, and cultural transformation of Oregon, Washington, and Idaho from Indian times to the present. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 570. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSLISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: REL 570

HST 571. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from the English background to 1689. HST 471/HST 571, HST 472/572 need not be taken in sequence. Not offered every year.
Recommended: HST 201

HST 572. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from 1689 to 1763. HST 471/HST 571, HST 472/572 need not be taken in sequence. Not offered every year.
Recommended: HST 201

HST 573. THE ERA OF THE AMERICAN REVOLUTION. (4 Credits)
The American Revolution, the drafting of the Constitution, and the launching of the new nation, 1763 to 1789. Not offered every year.
Recommended: HST 201

HST 574. JEFFERSONIAN AND JACKSONIAN DEMOCRACY. (4 Credits)
American political, economic, religious, and social development during the early and middle national era with emphasis on the formation and growth of political parties, territorial expansion and western settlement, and the beginnings of sectional conflict. Not offered every year.
Recommended: HST 201 and HST 202

HST 575. CIVIL WAR AND RECONSTRUCTION. (4 Credits)
Origins of the war, nature of the war, and the critical postwar era, 1830s to 1880s, with special attention to the changing historiography of the period. Not offered every year.
Recommended: HST 201

HST 576. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSLISTED as HST 485/REL 485 and HST 585/REL 585.
Equivalent to: REL 584

HST 577. THE PROGRESSIVE AND NEW DEAL ERAS. (4 Credits)
United States political, cultural, and diplomatic history from the Second World War through the 1970s, with special emphasis on the Cold War at home and abroad. Not offered every year.
Recommended: HST 203

HST 578. THE U.S. SINCE 1939. (4 Credits)
United States political, cultural, and diplomatic history from the Second World War through the 1970s, with special emphasis on the Cold War at home and abroad. Not offered every year.
Recommended: HST 203

HST 579. ENVIRONMENTAL HISTORY OF THE UNITED STATES. (4 Credits)
A study of human interaction with the environment and the transformation of the landscape and ecology of North America from the Indian period to the present, with special attention to the progressive alterations induced by the modernizing world of agriculture, industry, urbanism, and their relation to the market system in the United States. Not offered every year.
Recommended: HST 201, HST 202, HST 203

HST 580. RELIGION AND LAW. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western "secular" society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others' laws, and the ways in which modern societies have used law to separate "religion" from the state. CROSSLISTED as HST 484/REL 484 and HST 584/REL 584.
Equivalent to: REL 584

HST 581. ENVIRONMENTAL HISTORY OF THE UNITED STATES. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western "secular" society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others' laws, and the ways in which modern societies have used law to separate "religion" from the state. CROSSLISTED as HST 484/REL 484 and HST 584/REL 584.
Equivalent to: REL 584
HST 586. A HISTORY OF CHRISTIANITY IN AFRICA. (4 Credits)
An investigation of the historical development and changing character of Christianity in Africa. Topics include the examination of the role of Christianity in the development of social identity and politics in historic Ethiopia from the early first millennium CE; Portuguese missionary efforts in Central Africa during the period of the Atlantic slave trade from the 15th to the 18th centuries; the role of 19th century missionaries in both spreading Christianity in Africa and during the European colonization of Africa at the end of the 19th century; the emergence of African independence churches and prophetic Christianity in the 20th century; and the .
Recommended: HST 381 and/or HST 382

HST 587. WORLD WAR II: A GLOBAL HISTORY. (4 Credits)
Examines World War II from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at the US, USSR, Britain, Germany and Japan. Topics will include the concept of total war and the home fronts of a number of nations.
Recommended: Completion or concurrent enrollment in HST 103

HST 588. THE UNITED STATES AND VIETNAM 1945-1995. (4 Credits)
Examines the Vietnam War from both the US and Vietnamese perspective within the context of the Cold War. Political, military, social and moral issues will be covered within the concept of American exceptionalism.

HST 590. ISRAELI SOCIETY AND PLURALISM. (4 Credits)
Overwhelmingly a nation of immigrants, modern Israel displays an extraordinary amount of ethnic and social diversity among the 75% of its citizens who identify as Jews and among the 25% defined as Arab or “other.” By introducing students to Israel’s ethnic, religious, LGBTQ, migrant worker and refugee communities, this course examines the tensions that inform Israel’s efforts to construct a national identity within a multicultural society. Israel aspires to be both liberal democratic and Jewish, secular and religious. As such, it provides an unparalleled case study for investigating how a society negotiates the dynamics of inclusion, exclusion and difference.

HST 594. MODERN JAPAN: A CULTURAL HISTORY. (4 Credits)
Japanese history from the Meiji to the contemporary period (1980s/1990s). Examination of Japanese tradition and the Tokugawa period. Investigation of Westernization/modernization, imperialism, national identity, gender, atomic bomb(s), and post-war culture.

HST 595. CHINA IN 20TH CENTURY. (4 Credits)
Treats the decline of the Confucian tradition, shifts in the economy, and metamorphoses of the political system. Attention is given to China’s attempt to balance her Communist revolutionary legacies with her current modernizing goals.
Recommended: HST 391 and HST 392

HST 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

History of Science
HSTS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 407. SEMINAR. (1-16 Credits)
Equivalent to: HSTS 407H
This course is repeatable for 16 credits.

HSTS 411. *HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas within their social and cultural contexts. Scientific thought from ancient civilizations to the post-Roman era. Not offered every year. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Recommended: Upper-division standing and at least one science sequence

HSTS 412. *HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas within their social and cultural context. Origin of modern science in the 16th and 17th centuries. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and at least one science sequence

HSTS 413. *HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas with their social and cultural context. Development of modern science in the 18th and 19th centuries and to the present. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and at least one science sequence

HSTS 414. *HISTORY OF TWENTIETH-CENTURY SCIENCE. (4 Credits)
Focuses on the organization, practice, and theories of the natural sciences in the twentieth century, with emphasis primarily on the European and American scientific traditions from the 1890s to the present. (H) (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core

HSTS 415. **THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin’s theory of evolution. Reception of theory and history of evolution to the present. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 415H
Recommended: Upper-division standing.

HSTS 415H. **THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin’s theory of evolution. Reception of theory and history of evolution to the present. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 415

HSTS 416. *HISTORY OF MEDICINE PRE-1800. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine’s development to general changes in science and culture, to 1800. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
HSTS 417. **HISTORY OF MEDICINE. (4 Credits)**
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 417H

HSTS 417H. **HISTORY OF MEDICINE. (4 Credits)**
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine’s development to general changes in science and culture. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 417

HSTS 418. **SCIENCE AND SOCIETY. (4 Credits)**
Historical study of the interaction of science and society. Case studies are used from the 18th through 20th centuries. Topics vary by term. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HSTS 419. **STUDIES IN SCIENTIFIC CONTROVERSY: METHODS AND PRACTICES. (4 Credits)**
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 419H

HSTS 419H. **STUDIES IN SCIENTIFIC CONTROVERSY: METHODS AND PRACTICES. (4 Credits)**
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 419

HSTS 421. **TECHNOLOGY AND CHANGE. (4 Credits)**
Current views of technology and associated cultural changes and the contexts in which these developed; the changing role of technology in modern industrial society, especially in the United States; recent efforts to predict and control technological developments and the social and cultural consequences. (H) (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core

HSTS 422. **HISTORICAL STUDIES OF SCIENCE AND POLITICS. (4 Credits)**
The historical study of scientists, their work, their political and ethical choices mainly in the United States and Europe from the 1920s to the 1950s. (H) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core

HSTS 423. **SCIENCE AND RELIGION. (4 Credits)**
A historical survey of critical issues in the relationship of Western science and religion from ancient times to the end of the twentieth century. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC

HSTS 425. **HISTORY OF THE LIFE SCIENCES. (4 Credits)**
History of ideas about life from Greeks to present day. Cultural background and development of major theories of the life sciences with emphasis on natural history. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC
Recommended: Upper-division standing plus one year college sciences.

HSTS 437. **HISTORY OF ANIMALS IN SCIENCE. (4 Credits)**
Using a variety of sources, this course explores the ways humans have thought about and used animals in science and medicine from the seventeenth century to the present. How has science constructed the boundaries between humans and animals, and what have the consequences been for each? (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

HSTS 440. **HISTORY OF PSYCHOTHERAPY. (4 Credits)**
The history of psychotherapy in modern Western societies, from biomedical, cultural, political, and psychosocial perspectives. Not offered every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 440H

HSTS 440H. **HISTORY OF PSYCHOTHERAPY. (4 Credits)**
The history of psychotherapy in modern Western societies, from biomedical, cultural, political, and psychosocial perspectives. Not offered every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 440

HSTS 451. **THE HISTORY OF OUTER SPACE. (4 Credits)**
Advancements in technology and science have made it possible to observe, robotically explore, personally visit, and daily use outer space including an overview of what we have learned, how this endeavor has shaped human civilization and culture, and what may lie ahead. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
HSTS 452. *A WOMEN'S HISTORY OF OUTER SPACE. (4 Credits)
Since early Babylon, women have also observed the sky, performed fundamental calculations, examined astronomical plates, and made significant fundamental discoveries that changed the way we see the cosmos. At NASA, women have gone from purely secretarial positions in 1958 to commanding the International Space Station and administering the Mars Rover Program today. These advancements in opportunity and responsibility reflect a larger story of how traditional roles for women have evolved in response to changes in both technology and social norms. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
HSTS 499. SPECIAL TOPICS. (1-16 Credits)
(H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 499H
This course is repeatable for 16 credits.
HSTS 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
HSTS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
HSTS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
HSTS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
HSTS 511. HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas within their social and cultural context. Scientific thought from ancient civilizations to the post-Roman era. Not offered every year. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence.
Recommended: At least one science sequence
HSTS 512. HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas with their social and cultural context. Origin of modern science in the 16th and 17th centuries. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence.
Recommended: At least one science sequence
HSTS 513. HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas with their social and cultural context. Development of modern science in the 18th and 19th centuries and to the present. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence.
Recommended: At least one science sequence
HSTS 514. HISTORY OF TWENTIETH-CENTURY SCIENCE. (4 Credits)
Focuses on the organization, practice, and theories of the natural sciences in the twentieth century, with emphasis primarily on the European and American scientific traditions from the 1890s to the present.
HSTS 515. THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin's theory of evolution. Reception of theory and history of evolution to the present.
HSTS 516. HISTORY OF MEDICINE PRE-1800. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture, to 1800.
HSTS 517. HISTORY OF MEDICINE. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture.
HSTS 518. SCIENCE AND SOCIETY. (4 Credits)
Historical study of the interaction of science and society. Case studies are used from the 18th through 20th centuries. Topics vary by term.
HSTS 519. STUDIES IN SCIENTIFIC CONTROVERSY: METHOD AND PRACTICE OF. (4 Credits)
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries.
HSTS 521. TECHNOLOGY AND CHANGE. (4 Credits)
Current views of technology and associated cultural changes and the contexts in which these developed; the changing role of technology in modern industrial society, especially in the United States; recent efforts to predict and control technological developments and the social and cultural consequences.
HSTS 522. HISTORICAL STUDIES OF SCIENCE AND POLITICS. (4 Credits)
The historical study of scientists, their work, their political and ethical choices mainly in the United States and Europe from the 1920s to the 1950s.
HSTS 523. SCIENCE AND RELIGION. (4 Credits)
A historical survey of critical issues in the relationship of Western science and religion from ancient times to the end of the twentieth century.
HSTS 525. HISTORY OF THE LIFE SCIENCES. (4 Credits)
History of ideas about life from Greeks to present day. Cultural background and development of major theories of the life sciences with emphasis on natural history.
Recommended: One year of college sciences
HSTS 537. HISTORY OF ANIMALS IN SCIENCE. (4 Credits)
Using a variety of sources, this course explores the ways humans have thought about and used animals in science and medicine from the seventeenth century to the present. How has science constructed the boundaries between humans and animals, and what have the consequences been for each?
HSTS 540. HISTORY OF PSYCHOTHERAPY. (4 Credits)
The history of psychotherapy in modern Western societies, from biomedical, cultural, political, and psychosocial perspectives. Not offered every year.
HSTS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 36 credits.
HSTS 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

Peace Studies
PAX 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
PAX 201. STUDY OF PEACE AND THE CAUSES OF CONFLICT. (3 Credits)
Examination of the causes of personal, social, and institutional conflict and peaceful, constructive means of dealing with conflict. The history and current status of peace movements within and outside governments; prospects for world peace. Case studies in peace and conflict. CROSSTLISTED as PAX 201/REL 201. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 201

PAX 301. *PEACE STRATEGIES. (4 Credits)
Investigates the relationship between science, peace and justice on personal, community and global scales. Applies peace literacy skills to understand the historical foundations of complex issues today. Emphasis on how students can contribute to solving current scientific and social problems.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

PAX 402. INDEPENDENT STUDY. (1-16 Credits)
Individual basic and applied study projects on peace-related issues, designed in consultation with the Peace Studies Program director or a member of the Peace Studies faculty. This course is repeatable for 16 credits.

PAX 405. READING AND CONFERENCE. (1-16 Credits)
Study supervised and directed by members of the Peace Studies Program committee or approved faculty, as arranged by the student and Peace Studies Program director. This course is repeatable for 16 credits.

PAX 407. SEMINAR. (1-16 Credits)
Close examination of peace-related topics, including theory, method, research, and application. May be taken more than one time as topics vary. This course is repeatable for 16 credits.

PAX 410. PEACE STUDIES INTERNSHIP. (1-16 Credits)
Directed, supervised, and evaluated field work, to supplement the student’s classroom work, arranged one term in advance. This course is repeatable for 16 credits.

PAX 415. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.
Equivalent to: PAX 415H
This course is repeatable for 16 credits.

PAX 415H. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary. Attributes: CSST – Core, Synthesis, Science/Technology/Society

PAX 499. TOPICS IN PEACE STUDIES. (1-4 Credits)
Examination of the work of a particular nonviolence theorist or of a specific problem; e.g., pacifism and humanitarian intervention, nonviolence and gender. Course may be repeated as appropriate. Not offered every year.
This course is repeatable for 8 credits.

PAX 502. INDEPENDENT STUDY. (1-16 Credits)
Individual basic and applied study projects on peace-related issues, designed in consultation with the Peace Studies Program director or a member of the Peace Studies faculty. This course is repeatable for 16 credits.

PAX 505. READING AND CONFERENCE. (1-16 Credits)
Study supervised and directed by members of the Peace Studies Program committee or approved faculty, as arranged by the student and Peace Studies Program director. This course is repeatable for 16 credits.

PAX 507. SEMINAR. (1-16 Credits)
Close examination of peace-related topics, including theory, method, research, and application. May be taken more than one time as topics vary. This course is repeatable for 16 credits.

PAX 510. PEACE STUDIES INTERNSHIP. (1-16 Credits)
Directed, supervised, and evaluated field work, to supplement the student’s classroom work, arranged one term in advance. This course is repeatable for 16 credits.

PAX 515. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.

PAX 599. TOPICS IN PEACE STUDIES. (1-4 Credits)
Examination of the work of a particular nonviolence theorist or of a specific problem; e.g., pacifism and humanitarian intervention, nonviolence and gender. Course may be repeated as appropriate. Not offered every year.
This course is repeatable for 8 credits.

Philosophy

PHL 101. CRITICAL THINKING. (4 Credits)
Analysis of arguments, basic patterns of inductive and deductive reasoning, logical relations, and logical fallacies. Intended to improve analytical, critical and reasoning skills.

PHL 110. CRITICAL ANALYSIS. (3 Credits)
Development of a question-asking attitude for academic study. Enables students to explore issues and make informed decisions.

PHL 121. *REASONING AND WRITING. (3 Credits)
Develops critical thinking skills to increase clarity and effectiveness of student writing; uses writing experiences to teach critical thinking skills. Subjects include identifying and evaluating arguments, analyzing assumptions, justifying claims with reasons, avoiding confused or dishonest reasoning, applying common patterns of reasoning in everyday contexts, and writing cogent complex arguments. (Bacc Core Course)

PHL 150. *GREAT IDEAS IN PHILOSOPHY. (3 Credits)
Explores the assumptions and deeper meanings of familiar concepts and experiences. An introduction to some basic and famous ideas in Western thought. Topics may include truth, beauty, infinity, perception, freedom, pleasure, knowledge, mind and body, morality, justice, and political authority. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

PHL 160. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam. Lec/rec. CROSSTLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160H, REL 160, REL 160H
PHL 160H. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam. Lec/rec. CROSSTLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, REL 160, REL 160H

PHL 170. *THE IDEA OF GOD. (4 Credits)
Concepts and images of God and their connections to world-views, experience, science, gender, society, self-understanding, and religions. CROSSTLISTED as PHL 170/REL 170. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: REL 170

PHL 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies.
Equivalent to: PHL 199H
This course is repeatable for 16 credits.

PHL 201. *INTRODUCTION TO PHILOSOPHY. (4 Credits)
An in-depth introduction to the methods and ideas of Western philosophy, concentrating on such great figures as Socrates, Plato, Aristotle, Descartes, Kant and Nietzsche and such topics as the nature of reality, the existence of God, knowledge and doubt, the relation of consciousness to the world, free will and determinism, good and evil, and minds and machines. Philosophers and ideas covered will vary by the section. Written assignments are required. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

PHL 202. INTRODUCTION TO RELIGIOUS STUDIES. (4 Credits)
An introduction to the academic study of religion. It examines the concepts of religion and the sacred, approaches to the study of religion, ubiquitous features of religious experience, including symbol, myth, ritual, and community, understandings of the human condition in diverse religious traditions, and ways religious communities address challenges of pluralism and secularization. CROSSTLISTED as PHL 202/REL 202.
Equivalent to: REL 202

PHL 203. *THE MEANING OF EXISTENCE. (4 Credits)
Introduction to existentialism; explores different philosophical approaches to the significance of human life, meaning, and freedom. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

PHL 205. *ETHICS. (4 Credits)
Introduction to ethical theory and to the evaluation of ethical issues in society such as sexual ethics and euthanasia. Includes the study of philosophical theories of moral responsibility and moral virtue, and the philosophical ideas behind ethics debates in society. Students are encouraged to develop their own positions on ethical issues through discussion projects and term papers. Lec/rec. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 205H

PHL 205H. *ETHICS. (4 Credits)
Introduction to ethical theory and to the evaluation of ethical issues in society such as sexual ethics and euthanasia. Includes the study of philosophical theories of moral responsibility and moral virtue, and the philosophical ideas behind ethics debates in society. Students are encouraged to develop their own positions on ethical issues through discussion projects and term papers. Lec/rec. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 205

PHL 206. *RELIGIOUS ETHICS AND MORAL PROBLEMS. (4 Credits)
An examination of the practical ethics of the monotheistic religious traditions of the West--Judaism, Christianity, Islam--and their different approaches to concrete moral problems. Topics include sexuality and marriage, euthanasia, capital punishment, pacifism and just war, and environmentalism. CROSSTLISTED as PHL 206/REL 206. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 207H

PHL 208. INTRODUCTION TO BUDDHIST TRADITIONS. (4 Credits)
Survey of the historical development of Buddhism in India and its spread throughout Asia and beyond by investigating the literature, rituals, history and social structure of the Buddhist traditions of Sri Lanka and Southeast Asia, Tibet and the Himalayan region, China, Taiwan, Korea, Japan, and finally its growth in the West. CROSSTLISTED as PHL 208/REL 208. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: REL 208

PHL 209. *SELF AND SOCIETY. (4 Credits)
An introduction to social philosophy, addresses the interactions between the development of personal identity (self) and social structures, including social relations, institutions, norms and values. Includes issues in philosophical anthropology (what it means to be human), social theories of the self, and perspectives from feminist philosophy, post-colonial studies, and non-Western contributions in so-cial philosophy. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

PHL 210. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSTLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: HST 210, HST 210H, PHL 210H, REL 210
PHL 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: HST 210, HST 210H, PHL 210, REL 210, REL 210H

PHL 213. *INTRODUCTION TO HINDU TRADITIONS. (4 Credits)
Survey of the historical development of Hinduism in India and the 'Hindu Diaspora.' Topics will include the Indus Valley civilization, the Vedic tradition, yoga, and Hindu renunciation, 'Classical' Hindu theism and devotion, Hindu philosophy and ritual, and modern and contemporary Hinduism. CROSSLISTED as PHL 213/REL 213. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210, REL 210, REL 210H

PHL 214. *INTRODUCTION TO ISLAMIC TRADITIONS. (4 Credits)
Development of Islamic traditions in the Arab world and in the global context. Origins of Islam, the narrative of the Prophet Muhammad, the development of the Qur'an, and the central tenets of Islamic faith and practice. Transformation of Islam from a regional to a global tradition. CROSSLISTED as PHL 214/REL 214. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: REL 214

PHL 220. *WORLD-VIEWS AND VALUES IN THE BIBLE. (4 Credits)
A study of central portions of the Bible (in the Old Testament: Torah, prophets, psalms, and wisdom; in the New Testament: Jesus, gospels, and letters) from the perspective of the academic discipline of biblical scholarship, exploring the philosophical questions of the relationships between story, myth, thought, values, and understandings of life. CROSSLISTED as PHL 220/REL 220. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: REL 220

PHL 224. *PHILOSOPHY OF HAPPINESS. (3 Credits)
Explores various philosophical and psychological approaches to happiness and how culturally specific ideas of happiness have shaped the social and cultural realities around the world. Explores the human need for happiness within cultures. Examines happiness through the writings of the greatest Eastern and Western philosophers. Analyzes research on happiness within positive psychology.
Attributes: CPWC – Core, Pers, West Culture

PHL 251. *KNOWERS, KNOWING, AND THE KNOWN. (4 Credits)
An introduction to the major debates in Western philosophy concerning the nature of reality, and the ways we come to know about that reality. One example concerns debates about the problem of skepticism: Is it possible that humans could be completely mistaken about the way the world is? Another example concerns debates about human identity and free will. Beginning with historical figures such as Descartes and Hume, the course also provides an introduction to more contemporary thinkers. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 251H

PHL 251H. *KNOWERS, KNOWING, AND THE KNOWN. (4 Credits)
An introduction to the major debates in Western philosophy concerning the nature of reality, and the ways we come to know about that reality. One example concerns debates about the problem of skepticism: Is it possible that humans could be completely mistaken about the way the world is? Another example concerns debates about human identity and free will. Beginning with historical figures such as Descartes and Hume, the course also provides an introduction to more contemporary thinkers. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, WGSS 295, WGSS 295H

PHL 275. *INTRODUCTION TO DISABILITY STUDIES. (4 Credits)
Introduces core concepts and themes in the multidisciplinary field of disability studies. Analyzes disability as a product of discriminatory, oppressive, and inaccessible built environments and societies. Explores disability pride, culture, and community as alternatives to medical and charity models of disability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PHL 275H

PHL 275H. *INTRODUCTION TO DISABILITY STUDIES. (4 Credits)
Introduces core concepts and themes in the multidisciplinary field of disability studies. Analyzes disability as a product of discriminatory, oppressive, and inaccessible built environments and societies. Explores disability pride, culture, and community as alternatives to medical and charity models of disability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PHL 275H

PHL 280. *ETHICS OF DIVERSITY. (4 Credits)
Uses moral philosophy to examine difference-based discrimination and prejudice in the human community. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 280H

PHL 280H. *ETHICS OF DIVERSITY. (4 Credits)
Uses moral philosophy to examine difference-based discrimination and prejudice in the human community. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 280H

PHL 295. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENG 295, ENG 295H, PHL 295, WGSS 295, WGSS 295H

PHL 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, WGSS 295, WGSS 295H

PHL 299. SELECTED TOPICS. (1-16 Credits)
Equivalent to: PHL 299H

This course is repeatable for 99 credits.
PHL 301. *HISTORY OF WESTERN PHILOSOPHY. (4 Credits)
A study of the history of Western philosophy from the early Greeks into the twentieth century. Designed to give an appreciation and understanding of the Western philosophical tradition and the philosophical foundations of Western civilization. May be taken independently. PHL 301: Greek and Roman philosophy. PHL 302: The rise of modern philosophy through Hume. PHL 303: Kant and the nineteenth century. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: 3 credits of philosophy

PHL 302. *HISTORY OF WESTERN PHILOSOPHY. (4 Credits)
A study of the history of Western philosophy from the early Greeks into the twentieth century. Designed to give an appreciation and understanding of the Western philosophical tradition and the philosophical foundations of Western civilization. May be taken independently. PHL 301: Greek and Roman philosophy. PHL 302: The rise of modern philosophy through Hume. PHL 303: Kant and the nineteenth century. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: 3 credits of philosophy

PHL 303. *HISTORY OF WESTERN PHILOSOPHY. (4 Credits)
A study of the history of Western philosophy from the early Greeks into the twentieth century. Designed to give an appreciation and understanding of the Western philosophical tradition and the philosophical foundations of Western civilization. May be taken independently. PHL 301: Greek and Roman philosophy. PHL 302: The rise of modern philosophy through Hume. PHL 303: Kant and the nineteenth century. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: 3 credits of philosophy

PHL 309. *SELF AND SOCIETY. (4 Credits)
As introduction to social philosophy, addresses the interactions between the development of personal identity (self) and social structures, including social relations, institutions, norms and values. Includes issues in philosophical anthropology (what it means to be human), social theories of the self, and perspecti

PHL 310. *CRITICS OF RELIGION. (4 Credits)
An introduction to critiques of religion by Nietzsche, Freud, Marx, and other influential thinkers. Examines the nature, scope, and effects of criticisms that challenge the psychological, moral, political, and epistemological foundations of religious belief, practice, and institutions. CROSSLISTED as PHL 310/REL 310. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: REL 310

PHL 312. *ASIAN THOUGHT. (4 Credits)
Familiarizes students with key figures in the history of Asian religious ideas and philosophy. While the emphasis will be on the philosophical traditions of Asia, it will quickly become apparent that philosophy and religion are not so easily distinguishable in many Asian traditions. Areas of thought studied will include Hindu, Buddhist, Confucian, and Taoist. CROSSLISTED as PHL 312/REL 312. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Non-Western Core
Equivalent to: REL 312

PHL 315. *GANDHI AND NONVIOLENCE. (4 Credits)
An examination of the life and work of Mohandas K. Gandhi, the 20th century activist and author, and the theory and practice of nonviolence in his life and work. Emphasis will be placed upon Gandhi's biographical narrative, the development of satyagraha, Gandhi's nonviolent approach to social transformation, and post-Gandhian nonviolent movements. CROSSLISTED as PHL 315/REL 315. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PHL 315H, REL 315

PHL 316. INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS. (4 Credits)
The philosophical, social, cultural, and political reality of Mexican Americans and their historical roots in Mexico since the Spanish Conquest. Analysis of internal colonialism, racism, machismo, fatalism, alienation, cultural identity, as well as more contemporary including NAFTA, immigration, and U.S.-Mexican relations. CROSSLISTED as PHL 316/REL 316. (NC)
Attributes: LACH – Liberal Arts Non-Western Core
Equivalent to: REL 316

PHL 321. DEDUCTIVE LOGIC. (4 Credits)
Development of formal language and deductive systems for first-order, quantificational logic. Emphasis on translation of ordinary English statements into formal language. Discussion of the contrast between semantic and syntactic treatment of logical concepts.
Recommended: Upper-division standing or PHL 101.

PHL 325. *SCIENTIFIC REASONING. (4 Credits)
Introduction to and analysis of scientific reasoning. Emphasis on understanding and evaluation of theoretical hypotheses, causal and statistical models, and uses of scientific knowledge to make personal and public decisions. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: PHL 325H

PHL 342. CONTEMPORARY ETHICS. (4 Credits)
A study of significant ethical developments and issues in contemporary society, including ethical principles and concepts behind social debates on such matters as sexual ethics, abortion, discrimination, the uses of animals in scientific research, and responsibilities of corporations. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: PHL 205

PHL 344. *PACIFISM, JUST WAR, AND TERRORISM. (4 Credits)
An examination of the philosophical and theological issues pertaining to pacifism, justified war, and forms of terrorism in Islamic and Western traditions. Special attention is given to concepts of jihad, justifications of war, and restraints on conduct in war. CROSSLISTED as PHL 344/REL 344. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: PHL 344H, REL 344
PHL 345. *FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE. (4 Credits)
An examination of the religious, philosophical, political, and historical issues regarding religious freedom, conscience, and disestablishment as enshrined in the First Amendment and as illustrated by historical and contemporary examples of religious intolerance in the United States. CROSSLISTED as PHL 345/REL 345. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: REL 345

PHL 360. *PHILOSOPHY AND THE ARTS. (4 Credits)
Major philosophical theories about art and its meaning, from ancient to modern times. How philosophers have understood beauty, the imagination, art and knowledge, art and pleasure, art and emotion. Offered every other year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 360H
Recommended: 3 credits of philosophy or upper-division standing

PHL 360H. *PHILOSOPHY AND THE ARTS. (4 Credits)
Major philosophical theories about art and its meaning, from ancient to modern times. How philosophers have understood beauty, the imagination, art and knowledge, art and pleasure, art and emotion. Offered every other year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 360
Recommended: 3 credits of philosophy or upper-division standing

PHL 365. *LAW IN PHILOSOPHICAL PERSPECTIVE. (4 Credits)
A study of philosophical issues in the law through the examination of legal cases and major essays in jurisprudence. Special attention given to concepts of justice, responsibility, liberty, law, and legal ethics. Offered every other year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: 3 credits of philosophy or upper-division standing.

PHL 371. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. Not offered every year. CROSSLISTED as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 371H, REL 371
Recommended: 3 credits of philosophy or upper-division standing.

PHL 371H. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. Not offered every year. CROSSLISTED as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 371, REL 371
Recommended: 3 credits of philosophy or upper-division standing

PHL 390. MORAL THEORIES. (3 Credits)
Examines the evolution of moral philosophy from the beginning of Western, Greek-based philosophy through contemporary moral theory, and will include philosophical questions about moral philosophy generally, virtue ethics, deontology, utilitarianism, environmental ethics, animal rights, and feminism and ecofeminism.
Prerequisites: PHL 205 with D- or better

PHL 399. SPECIAL TOPICS IN PHILOSOPHY. (1–4 Credits)
Examination of the work of a philosopher or of a specific philosophical problem; e.g., Wittgenstein, determinism, perception, philosophy of mind. May be repeated for credit when topic varies. Not offered every year.
Equivalent to: PHL 399H
This course is repeatable for 16 credits.
Recommended: 3 credits of upper-division philosophy

PHL 399H. SPECIAL TOPICS IN PHILOSOPHY. (1–4 Credits)
Examination of the work of a philosopher or of a specific philosophical problem; e.g., Wittgenstein, determinism, perception, philosophy of mind. May be repeated for credit when topic varies. Not offered every term.
Attributes: HNRS – Honors Course Designator
Equivalent to: PHL 399
This course is repeatable for 16 credits.

PHL 402. INDEPENDENT STUDY. (1–16 Credits)
This course is repeatable for 16 credits.

PHL 403. THESIS. (1–16 Credits)
This course is repeatable for 16 credits.

PHL 405. READING AND CONFERENCE. (1–16 Credits)
Equivalent to: PHL 405H
This course is repeatable for 16 credits.
Recommended: Sophomore standing

PHL 407. ^SEMINAR. (1–16 Credits)
( Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: PHL 407H
This course is repeatable for 16 credits.
Recommended: Two upper-division philosophy courses and sophomore standing

PHL 407H. ^SEMINAR. (1–16 Credits)
( Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: PHL 407
This course is repeatable for 16 credits.
Recommended: Two upper-division philosophy courses and sophomore standing

PHL 410. INTERNSHIP. (1–12 Credits)
This course is repeatable for 16 credits.

PHL 411. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle, Descartes, Hume, Kant, or Marx. Each course normally devoted to the work of a single figure. Need not be taken in sequence. Not offered every year. CROSSLISTED as PHL 411/REL 411 and PHL 511/REL 511. (H)
Attributes: LACN – Liberal Arts Humanities Core
Equivalent to: REL 411
This course is repeatable for 16 credits.
Recommended: 6 credits of philosophy and sophomore standing.

PHL 417. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class, with in-depth consideration of selected social issues such as rape and pornography. CROSSLISTED as PHL 417/WGSS 417 and PHL 517/WGSS 517. (H)
Attributes: LACN – Liberal Arts Humanities Core
Equivalent to: WGSS 417, WS 417
Recommended: 6 credits of philosophy or upper-division standing.
PHL 421. MATHEMATICAL LOGIC. (3 Credits)
Rigorous definition of a formal logic and investigation of its characteristics. Emphasis on the distinction and relation between semantic and syntactic methods (model theory and proof theory) and on the meta-mathematical analysis of axiomatic theories. Not offered every year.
Recommended: PHL 321 or 6 credits of 400-level mathematics or computer science and sophomore standing.

PHL 430. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/REL 430 and PHL 530/REL 530. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 430H, REL 430

PHL 430H. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/REL 430 and PHL 530/REL 530. (NC)
Attributes: HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 430, REL 430

PHL 431. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists' living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Equivalent to: PHL 431H, REL 431

PHL 431H. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists' living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Attributes: HNRS – Honors Course Designator
Equivalent to: PHL 431, REL 431

PHL 432. *YOGA AND TANTRIC TRADITIONS. (4 Credits)
An examination of the theory and practice of yoga and tantra in the traditions of Hinduism, Buddhism, and Jainism, and in their contemporary popular manifestations. Emphasis on the representation of yoga and tantra in Indian literature and history, including contemplative practices, bodily disciplines, and ritual. CROSSLISTED as PHL 432/REL 432 and PHL 532/REL 532. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: REL 432

PHL 433. *THEORY AND PRACTICE OF MODERN YOGA. (4 Credits)
An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga, Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSLISTED as PHL 433/REL 433 and PHL 533/REL 533. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: REL 433

PHL 434. *SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 434H, REL 434, REL 434H

PHL 434H. *SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: PHL 434, REL 434, REL 434H

PHL 436. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: REL 436
Recommended: 6 credits of philosophy and sophomore standing.

PHL 439. PHILOSOPHY OF NATURE. (3 Credits)
Intensive one-week field course taught in the Cascade Range. What is nature? What is the relation of humans to the rest of the natural world? How are our concepts of nature and decisions about land use shaped by the words and metaphors we use? What is the value of wild places? What can we learn from a close study of the natural world about right ways of acting in communities, both civic and biotic? The course will draw on many ways of knowing—philosophical analysis, close observation, and especially writing. Camping required.

PHL 440. *ENVIRONMENTAL ETHICS. (3 Credits)
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 440H
Recommended: PHL 205 and PHL 342 and PHL 365 or 6 credits of philosophy and sophomore standing.
PHL 440H. *ENVIRONMENTAL ETHICS. (3 Credits)
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 440
Recommended: PHL 205 and PHL 342 and PHL 365 or 6 credits of philosophy and sophomore standing

PHL 443. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443H, REL 443, REL 443H
Recommended: One introductory-level science course and sophomore standing.

PHL 443H. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443, REL 443, REL 443H
Recommended: One introductory-level science course and sophomore standing

PHL 444. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444H, REL 444, REL 444H

PHL 444H. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444, REL 444, REL 444H

PHL 448. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: ES 448, REL 448

PHL 450. TOPICS. (1-16 Credits)
Uses the IDEAS MATTER lectures as the focus for an exploration of ideas that make a difference in the world. Students read background materials, attend lectures, meet with the speakers, and write essays on the ideas they learn. This course is repeatable for 16 credits.

PHL 451. KNOWLEDGE AND REALITY. (3 Credits)
Examination of significant theories of knowledge, theories concerning the nature of reality, and their connections. Includes an analysis of important concepts and problems, such as perception, induction, belief, empiricism, rationalism, and skepticism. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: 6 credits of philosophy, sophomore standing.

PHL 455. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSLISTED as PHL 455/REL 455 and PHL 555/REL 555.
Equivalent to: REL 455
Recommended: 6 credits of philosophy or sophomore standing

PHL 456. PHILOSOPHY OF MIND. (4 Credits)
Past and present theories about consciousness, the relationship of mind and body, and the roots and implications of those theories. Includes historical ‘isms’ (e.g., dualism, monism), contemporary views, and connections of these theories to further issues in philosophy and contemporary culture, e.g., desires, mental illness, personhood and otherness, animal minds, explanation, the mind in non-Western traditions and in religions.
Recommended: PHL 251

PHL 461. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSLISTED as PHL 461/REL 461 and PHL 561/REL 561.
Equivalent to: REL 461

PHL 470. PHILOSOPHY OF SCIENCE. (3 Credits)
Examination of philosophical questions, classic and contemporary, about science and scientific knowledge. Scientific explanations, the structure of theories, the concept of a natural law, revolutions in science, influences of the sciences and philosophy on one another, science and values. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: 6 credits of upper-division philosophy and sophomore standing
PHL 474. *PHILOSOPHY OF BIOLOGY. (4 Credits)
An introduction to some of the conceptual challenges engendered by contemporary evolutionary biology, including the nature of fitness, natural selection, adaptations, and species; identifying organisms, traits, and the units of selection; the evidence required to support particular adaptive or historical hypotheses; and others. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: Previous university-level course work in either philosophy or the biological sciences

PHL 499. TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific problem; e.g., Wittgenstein, determinism, perception. May be repeated for credit when topic varies. Not offered every year.
Equivalent to: PHL 499H
This course is repeatable for 16 credits.
Recommended: 6 credits of upper-division philosophy, sophomore standing

PHL 499H. TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific problem; e.g., Wittgenstein, determinism, perception. May be repeated for credit when topic varies. Not offered every year.
Attributes: CNTR – Critical, Thinking, Reasoning
Equivalent to: PHL 499
This course is repeatable for 4 credits.
Recommended: 6 credits of upper-division philosophy, sophomore standing

PHL 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PHL 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: Two upper-division philosophy courses

PHL 510. INTERNSHIP. (1-12 Credits)
This course is repeatable for 16 credits.

PHL 511. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle, Descartes, Hume, Kant, or Marx. Each course normally devoted to the work of a single figure. Need not be taken in sequence. Not offered every year. CROSSLISTED as PHL 411/REL 411 and PHL 511/REL 511.
Equivalent to: REL 511
This course is repeatable for 16 credits.
Recommended: 6 credits of philosophy

PHL 517. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class, with in-depth consideration of selected social issues such as rape and pornography. CROSSLISTED as PHL 417/WGSS 417 and PHL 517/WGSS 517.
Equivalent to: WGSS 517, WS 517
Recommended: 6 credits of philosophy

PHL 525. PHILOSOPHICAL METHODS. (3 Credits)
Examines diverse ways of approaching philosophical issues. Contains readings from different philosophical traditions. Develops understanding of the skills and conventions of philosophical argumentation.

PHL 530. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/REL 430 and PHL 530/REL 530.
Equivalent to: REL 530

PHL 531. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists' living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Equivalent to: REL 531

PHL 532. YOGA AND TANTRIC TRADITIONS. (4 Credits)
An examination of the theory and practice of yoga and tantra in the traditions of Hinduism, Buddhism, and Jainism, and in their contemporary popular manifestations. Emphasis on the representation of yoga and tantra in Indian literature and history, including contemplative practices, bodily disciplines, and ritual. CROSSLISTED as PHL 432/REL 432 and PHL 532/REL 532.
Equivalent to: REL 532

PHL 533. THEORY AND PRACTICE OF MODERN YOGA. (4 Credits)
An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga, Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSLISTED as PHL 433/REL 433 and PHL 533/REL 533.
Equivalent to: REL 533

PHL 534. SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Equivalent to: REL 534

PHL 536. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: REL 536

PHL 539. PHILOSOPHY OF NATURE. (3 Credits)
Intensive one-week field course taught in the Cascade Range. What is nature? What is the relation of humans to the rest of the natural world? How are our concepts of nature and decisions about land use shaped by the words and metaphors we use? What is the value of wild places? What can we learn from a close study of the natural world about right ways of acting in communities, both civic and biotic? The course will draw on many ways of knowing--philosophical analysis, close observation, and especially writing. Camping required.
PHL 540. ENVIRONMENTAL ETHICS. (3 Credits)
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity. 
Recommended: PHL 205 and PHL 342 and PHL 365 or 6 credits of philosophy

PHL 541. CLASSIC MORAL THEORIES. (3 Credits)
Philosophical issues in ethics analyzed through the examination of such classical works in moral philosophy as Aristotle's Nichomachean ethics. Not offered every year. 
Recommended: Either PHL 205 or PHL 342 or PHL 440 or one course in the history of philosophy

PHL 542. CONTEMPORARY MORAL THEORIES. (3 Credits)
Examines contemporary ethical theories through study of moral philosophy in the 20th century, including recent developments in such areas as environmental ethics and feminist/feminine ethics. 
Recommended: At least two philosophy courses including at least one of PHL 205 or PHL 342 or PHL 541.

PHL 543. WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSTLISTED as PHL 443/REL 443 and PHL 543/REL 543. 
Equivalent to: REL 543
Recommended: One introductory-level science course

PHL 544. BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSTLISTED as PHL 444/REL 444 and REL 544/REL 544. 
Equivalent to: REL 544

PHL 547. RESEARCH ETHICS. (3 Credits)
An examination of the interrelationship between ethical values and scientific practice. Topics include professionalism in science; scientific integrity, misconduct, and whistleblowing; the ethics of authorship; conflicts of interest between academic science and commercial science, and social responsibilities in science.

PHL 548. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSTLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548. 
Equivalent to: ES 548, REL 548

PHL 550. TOPICS. (1-16 Credits)
Uses the IDEAS MATTER lectures as the focus for an exploration of ideas that make a difference in the world. Students read background materials, attend lectures, meet with the speakers, and write essays on the ideas they learn. 
This course is repeatable for 16 credits.

PHL 551. KNOWLEDGE AND REALITY. (3 Credits)
Examination of significant theories of knowledge, theories concerning the nature of reality, and their connections. Includes an analysis of important concepts and problems, such as perception, induction, belief, empiricism, rationalism, and skepticism. Not offered every year. 
Recommended: 6 credits of philosophy

PHL 555. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSTLISTED as PHL 455/REL 455 and PHL 555/REL 555. 
Equivalent to: REL 555
Recommended: 6 credits of philosophy

PHL 556. PHILOSOPHY OF MIND. (4 Credits)
Past and present theories about consciousness, the relationship of mind and body, and the roots and implications of those theories. Includes historical ‘isms’ (e.g., dualism, monism), contemporary views, and connections of these theories to further issues in philosophy and contemporary culture, e.g., desires, mental illness, personhood and otherness, animal minds, explanation, the mind in non-Western traditions and in religions. 
Recommended: PHL 251

PHL 561. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSTLISTED as PHL 461/REL 461 and PHL 561/REL 561. 
Equivalent to: REL 561

PHL 570. PHILOSOPHY OF SCIENCE. (3 Credits)
Examination of philosophical questions, classic and contemporary, about science and scientific knowledge. Scientific explanations, the structure of theories, the concept of a natural law, revolutions in science, influences of the sciences and philosophy on one another, science and values. Not offered every year. 
Recommended: 6 credits of upper-division philosophy

PHL 574. PHILOSOPHY OF BIOLOGY. (4 Credits)
An introduction to some of the conceptual challenges engendered by contemporary evolutionary biology, including the nature of fitness, natural selection, adaptations, and species; identifying organisms, traits, and the units of selection; the evidence required to support particular adaptive or historical hypotheses; and others. 
Recommended: Previous university-level course work in either philosophy or the biological sciences

PHL 599. TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific problem; e.g., Wittgenstein, determinism, perception. May be repeated for credit when topic varies. Not offered every year. 
Equivalent to: PHL 590
This course is repeatable for 16 credits.
Recommended: 6 credits of upper-division philosophy
REL 160. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam.
Lec/rec. CROSSLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, PHL 160H, REL 160

REL 160H. *QUESTS FOR MEANING: WORLD RELIGIONS. (0-4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam.
Lec/rec. CROSSLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, PHL 160H, REL 160

REL 170. *THE IDEA OF GOD. (4 Credits)
Concepts and images of God and their connections to world-views, experience, science, gender, society, self-understanding, and religions.
CROSSLISTED as PHL 170/REL 170. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 170

REL 199. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 201. STUDY OF PEACE AND THE CAUSES OF CONFLICT. (3 Credits)
Examination of the causes of personal, social, and institutional conflict and peaceful, constructive means of dealing with conflict. The history and current status of peace movements within and outside governments; prospects for world peace. Case studies in peace and conflict.
CROSSLISTED as PAX 201/REL 201. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: PAX 201

REL 202. INTRODUCTION TO RELIGIOUS STUDIES. (4 Credits)
An introduction to the academic study of religion. It examines the concepts of religion and the sacred, approaches to the study of religion, ubiquitous features of religious experience, including symbol, myth, ritual, and community, understandings of the human condition in diverse religious traditions, and ways religious communities address challenges of pluralism and secularization.
CROSSLISTED as PHL 202/REL 202.
Equivalent to: PHL 202

REL 206. *RELIGIOUS ETHICS AND MORAL PROBLEMS. (4 Credits)
An examination of the practical ethics of the monotheistic religious traditions of the West—Judaism, Christianity, Islam—and their different approaches to concrete moral problems. Topics include sexuality and marriage, euthanasia, capital punishment, pacifism and just war, and environmentalism.
CROSSLISTED as PHL 206/REL 206. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 206

REL 208. INTRODUCTION TO BUDDHIST TRADITIONS. (4 Credits)
Survey of the historical development of Buddhism in India and its spread throughout Asia and beyond by investigating the literature, rituals, history and social structure of the Buddhist traditions of Sri Lanka and Southeast Asia, Tibet and the Himalayan region, China, Taiwan, Korea, Japan, and finally its growth in the West. CROSSLISTED as PHL 208/REL 208. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 208

REL 210. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present.
CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: HST 210, HST 210H, PHL 210, PHL 210H, REL 210

REL 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present.
CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210, PHL 210H, REL 210

REL 212. *INTRODUCTION TO CATHOLICISM. (4 Credits)
Explores historical experiences of Roman Catholics from the origins of the tradition to the present. The course 1) explores the historical origins and expansions of Catholicism in world history, 2) examines Catholic practices, structures, ideas and beliefs, and 3) surveys the unique form Catholicism took in United States history using a wide variety of sources, including historical monographs, novels, memoir, film, papal documents, correspondence, essays, speeches, poetry, political writing, sermons, advertisements, liturgy, and artwork. Learn about the major developments, persons, institutions, and ideas that shaped the experience of Catholics in different moments of world history.
Attributes: CPWC – Core, Pers, West Culture

REL 213. *INTRODUCTION TO HINDU TRADITIONS. (4 Credits)
Survey of the historical development of Hinduism in India and the ‘Hindu Diaspora.’ Topics will include the Indus Valley civilization, the Vedic tradition, yoga, and Hindu renunciation, ‘Classical’ Hindu theism and devotion, Hindu philosophy and ritual, and modern and contemporary Hinduism.
CROSSLISTED as PHL 213/REL 213. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 213

REL 214. *INTRODUCTION TO ISLAMIC TRADITIONS. (4 Credits)
Development of Islamic traditions in the Arab world and in the global context. Origins of Islam, the narrative of the Prophet Muhammad, the development of the Qur’an, and the central tenets of Islamic faith and practice. Transformation of Islam from a regional to a global tradition.
CROSSLISTED as PHL 214/REL 214. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 214

REL 215. *INTRODUCTION TO JEWISH TRADITIONS. (4 Credits)
An introduction to Judaism’s traditions, histories, and practices. Covers historical origins and developments from the biblical period through the Middle Ages, and considers Judaism in the modern world. Topics include the Jewish calendar (including holidays and their traditions), Jewish lifecycle events, Jewish prayer, and traditional texts such as the Mishnah and Talmud.
CROSSLISTED as HST 215/REL 215. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: HST 215
REL 220. *WORLD-VIEWS AND VALUES IN THE BIBLE. (4 Credits)
A study of central portions of the Bible (in the Old Testament: Torah, prophets, psalms, and wisdom; in the New Testament: Jesus, gospels, and letters) from the perspective of the academic discipline of biblical scholarship, exploring the philosophical questions of the relationships between story, myth, thought, values, and understandings of life. CROSSTILLED as PHL 220/REL 220. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 220

REL 299. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 310. *CRITICS OF RELIGION. (4 Credits)
An introduction to critiques of religion by Nietzsche, Freud, Marx, and other influential thinkers. Examines the nature, scope, and effects of criticisms that challenge the psychological, moral, political, and epistemological foundations of religious belief, practice, and institutions. CROSSTILLED as PHL 310/REL 310. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 310

REL 312. *ASIAN THOUGHT. (4 Credits)
Familiarizes students with key figures in the history of Asian religious ideas and philosophy. While the emphasis will be on the philosophical traditions of Asia, it will quickly become apparent that philosophy and religion are not so easily distinguishable in many Asian traditions. Areas of thought studied will include Hindu, Buddhist, Confucian, and Taoist. CROSSTILLED as PHL 312/REL 312. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Non-Western Core
Equivalent to: PHL 312

REL 315. *GANDHI AND NONVIOLENCE. (4 Credits)
An examination of the life and work of Mohandas K. Gandhi, the 20th century activist and author, and the theory and practice of nonviolence in his life and work. Emphasis will be placed upon Gandhi's biographical narrative, the development of satyagraha, Gandhi's nonviolent approach to social transformation, and post-Gandhian nonviolent movements. CROSSTILLED as PHL 315/REL 315. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PHL 315

REL 316. INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS. (4 Credits)
The philosophical, social, cultural, and political reality of Mexican Americans and their historical roots in Mexico since the Spanish Conquest. Analysis of internal colonialism, racism, machismo, fatalism, alienation, cultural identity, as well as more contemporary including NAFTA, immigration, and U.S.-Mexican relations. CROSSTILLED as PHL 316/REL 316. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 316

REL 324. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSTILLED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 324, HST 324H, REL 324H

REL 324H. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSTILLED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 324, HST 324H, REL 324H

REL 325. *EARLY CHRISTIANITY: ORIGINS TO 600. (4 Credits)
Traces early Christianity from its origins to the beginning of the Middle Ages. It deals with the origins and Jewish background of Christianity in Palestine, the ministry and teachings of Jesus, the spread of Christianity throughout the Roman Empire by his disciples and early missionaries, the formation of the New Testament canon, the development of Christian doctrine, controversies over heresy, and the origin of monasticism and the Papacy. CROSSTILLED as HST 325/REL 325. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: HST 325

REL 326. *HISTORY OF CHRISTIANITY. (4 Credits)
Examines the history of global Christianity from the fifth through the seventeenth centuries. Themes to be investigated include the evolving relationship between the church and the state; mysticism; conversion and resistance; the emergence of Protestantism; marriage and sex, as well as women in the history of Christianity. CROSSTILLED as HST 326/REL 326.
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: HST 326

REL 327. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 284 A.D. to 1000. Not offered every year. CROSSTILLED as HST 327/REL 327. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 327

REL 328. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 1000 to 1400. Not offered every year. CROSSTILLED as HST 328/REL 328. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 328

REL 330. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the Reformation. Not offered every year. CROSSTILLED as HST 330/REL 330. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 330

REL 333. MEDIEVAL AND EARLY MODERN SPANISH HISTORY. (4 Credits)
From Islamic conquest to conquest of America, the social, religious, political and economic history of Spain from 1000 to 1700. Offered fall term in odd years. CROSSTILLED as HST 333/REL 333. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 333
REL 344. *PACIFISM, JUST WAR, AND TERRORISM. (4 Credits)
An examination of the philosophical and theological issues pertaining
to pacifism, just war, and forms of terrorism in Islamic and Western
traditions. Special attention is given to concepts of jihad, justifications
of war, and restraints on conduct in war. CROSSLISTED as PHL 344/
REL 344. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 344

REL 345. *FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE. (4
Credits)
An examination of the religious, philosophical, political, and historical
issues regarding religious freedom, conscience, and disestablishment
as enshrined in the First Amendment and as illustrated by historical and
contemporary examples of religious intolerance in the United States.
CROSSLISTED as PHL 345/REL 345. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PHL 345

REL 350. *MODERN LATIN AMERICA. (4 Credits)
History of Latin America leading up to and after Spanish and Portuguese
conquest. Focus on indigenous American, European and African cultures
and religions in contact under colonial government and economic
systems. Covers the period from 1400 to 1810. CROSSLISTED as
HST 350/REL 350. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts
Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 350, HST 350H

REL 352. *AFRICANS IN LATIN AMERICAN HISTORY. (4 Credits)
A survey of the role of Africans and their descendants in Latin
American history, linking the history of the Americas, Europe and Africa.
CROSSLISTED as HST 352/REL 352. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 352
Recommended: HST 350 and HST 351

REL 353. *SLAVERY IN THE AMERICAS. (4 Credits)
A survey of the roles of Africans and their descendants in the history of
the Atlantic World, linking Europe, Africa, and the Americas. Examines
slavery and freedom in the African Diaspora, as well as social, cultural,
and spiritual life. CROSSLISTED as HST 353/REL 353. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 353

REL 364. *UNITED STATES RELIGION AND SOCIAL REFORM. (4 Credits)
Provides an awareness of how various religious groups have thought
about and engaged with social change pertaining to slavery, feminism,
civil rights, same-sex marriage, and immigration. Focus on reading
primary sources related to each of these issues. CROSSLISTED as
HST 364/REL 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: HST 364

REL 371. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism,
Taoism, Mohism, Legalism, and Buddhism. Not offered every year.
CROSSLISTED as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-
Western Core
Equivalent to: PHL 371, PHL 371H
Recommended: 3 credits of philosophy or upper-division standing.

REL 378. *RELIGION AND GENDER: A GLOBAL PERSPECTIVE. (4 Credits)
Introduces students to the academic study of religion, as well as the
academic study of gender. In order to offer a global perspective, we will
read a series of case studies that deal with the religion as a gendered
experience. Students will produce two essays, one of which will be
based on independent research. CROSSLISTED as HST 378/REL 378/
WGSS 378. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HST 378, WGSS 378

REL 387. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 600 to 1400. Early
history and the formation of Islamic society to the Mongol invasion.
CROSSLISTED as HST 387/REL 387. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts
Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 387

REL 388. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 1400 to the present.
The expansion of Islam, Turkic, and Asian dynasties, impact of Western
imperialism and modern Islamic world. CROSSLISTED as HST 388/
REL 388. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts
Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 388

REL 399. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 402. INDEPENDENT STUDY. (1-12 Credits)
This course is repeatable for 16 credits.

REL 405. READING AND CONFERENCE. (1-4 Credits)
This course is repeatable for 12 credits.

REL 407. *SEMINAR. (1-16 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

REL 411. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle,
Descartes, Hume, Kant, or Marx. Each course normally devoted to the
work of a single figure. Need not be taken in sequence. Not offered every
year. CROSSLISTED as PHL 411/REL 411 and PHL 511/REL 511. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: PHL 411
This course is repeatable for 16 credits.
Recommended: 6 credits of philosophy and sophomore standing.

REL 415. SELECTED TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 425. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The
general theme of anti-Semitism in European history is explored for
background. Topics discussed for comparative purposes include anti-
Semitism in American history; other episodes of mass murder in the 20th
century. Not offered every year. CROSSLISTED as HST 425/REL 425 and
HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts
Humanities Core
Equivalent to: HST 425, HST 425H, REL 425H
REL 425H. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425, HST 425H, REL 425

REL 430. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/REL 430 and PHL 530/REL 530. (NO)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 430, PHL 430H

REL 431. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists' living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Equivalent to: PHL 431, PHL 431H

REL 432. *YOGA AND TANTRIC TRADITIONS. (4 Credits)
An examination of the theory and practice of yoga and tantra in the traditions of Hinduism, Buddhism, and Jainism, and in their contemporary popular manifestations. Emphasis on the representation of yoga and tantra in Indian literature and history, including contemplative practices, bodily disciplines, and ritual. CROSSLISTED as PHL 432/REL 432 and PHL 532/REL 532. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 432

REL 433. *THEORY AND PRACTICE OF MODERN YOGA. (4 Credits)
An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga, Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSLISTED as PHL 433/REL 433 and PHL 533/REL 533. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 433

REL 434. *SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 434, PHL 434H, REL 434H

REL 434H. *SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: PHL 434, PHL 434H, REL 434

REL 436. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: PHL 436
Recommended: 6 credits of philosophy and sophomore standing.

REL 443. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443, PHL 443H, REL 443H
Recommended: One introductory-level science course and sophomore standing.

REL 443H. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443, PHL 443H, REL 443
Recommended: One introductory-level science course and sophomore standing.

REL 444. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444, PHL 444H, REL 444H

REL 444H. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444, PHL 444H, REL 444
REL 448. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448 and ES 548/PHL 548/REL 548. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: ES 448, PHL 448

REL 445. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSLISTED as PHL 455/REL 455 and PHL 555/REL 555.
Equivalent to: PHL 455
Recommended: 6 credits of philosophy or sophomore standing.

REL 461. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSLISTED as PHL 461/REL 461 and PHL 561/REL 561.
Equivalent to: PHL 461

REL 466. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSLISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: HST 466
Recommended: HST 202 and HST 203 or upper-division standing.

REL 470. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSLISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: HST 470

REL 484. RELIGION AND LAW. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western “secular” society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others’ laws, and the ways in which modern societies have used law to separate “religion” from the state. CROSSLISTED as HST 484/REL 484 and HST 584/REL 584.
Equivalent to: HST 484
REL 534. SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Equivalent to: PHL 534

REL 536. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: PHL 536
Recommended: 6 credits of philosophy

REL 543. WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543.
Equivalent to: PHL 543
Recommended: One introductory-level science course

REL 544. BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544.
Equivalent to: PHL 544

REL 548. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548.
Equivalent to: ES 548, PHL 548

REL 555. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSLISTED as PHL 455/REL 455 and PHL 555/REL 555.
Equivalent to: PHL 555
Recommended: 6 credits of philosophy

REL 561. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSLISTED as PHL 461/REL 461 and PHL 561/REL 561.
Equivalent to: PHL 561

REL 566. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSLISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: HST 566
Recommended: HST 202 and HST 203

REL 570. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSLISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: HST 570

REL 584. RELIGION AND LAW. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western “secular” society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others’ laws, and the ways in which modern societies have used law to separate “religion” from the state. CROSSLISTED as HST 484/REL 484 and HST 584/REL 584.
Equivalent to: HST 584

REL 585. POLITICS AND RELIGION IN THE MODERN MIDDLE EAST. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSLISTED as HST 485/REL 485 and HST 585/REL 585.
Equivalent to: HST 585

Twentieth Century Studies

TCS 407. SEMINAR. (1-12 Credits)
Advanced study of selected topics related to issues and problems in the twentieth century introduced in TCS core course offerings. Section I seminars will be graded pass/no pass and carry 1 credit; other sections will be graded A-F and will carry variable credit. This course is repeatable for 16 credits.

TCS 507. SEMINAR. (1-12 Credits)
Advanced study of selected topics related to issues and problems in the Twentieth Century introduced in TCS core course offerings. Section I seminars will be graded P/N and carry 1 credit; other sections will be graded A-F and will carry variable credit. This course is repeatable for 16 credits.

Applied Ethics Certificate

The Applied Ethics undergraduate certificate builds upon the various courses in ethics taught in the School of History, Philosophy, and Religion and courses with ethics-related content found throughout the university, in order to provide students with a systematic and thorough understanding of the moral world for their civic, professional, and personal lives.
Students pursuing a major in any academic or professional field may also pursue applied ethics for educational interest and for professional preparation. The certificate adds a critical philosophical dimension to students’ understanding of their professional aspirations.

Students seeking a baccalaureate degree at OSU may earn the Applied Ethics certificate by completing a minimum of 28 credits of approved course work.

For more information, contact Courtney Campbell, 541-737-5651, ccampbell@oregonstate.edu

Certificate Code: C200

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
<td>4</td>
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<tr>
<td>PHL 150</td>
<td>*GREAT IDEAS IN PHILOSOPHY</td>
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<tr>
<td>PHL 280</td>
<td>*ETHICS OF DIVERSITY</td>
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<tr>
<td>PHL 325</td>
<td>*SCIENTIFIC REASONING</td>
<td></td>
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<tr>
<td>PHL 342</td>
<td>CONTEMPORARY ETHICS</td>
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<tr>
<td>PHL 390</td>
<td>MORAL THEORIES</td>
<td></td>
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<td>PHL 405</td>
<td>READING AND CONFERENCE</td>
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<td>PHL 417</td>
<td>FEMINIST PHILOSOPHIES</td>
<td></td>
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<tr>
<td>PHL 440</td>
<td>*ENVIRONMENTAL ETHICS</td>
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<tr>
<td>PHL 443</td>
<td>*WORLD VIEWS AND ENVIRONMENTAL VALUES</td>
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<td>PHL 444</td>
<td>*BIOMEDICAL ETHICS</td>
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<tr>
<td>PHL 450</td>
<td>TOPICS</td>
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<tr>
<td>PHL 499</td>
<td>TOPICS IN PHILOSOPHY (with departmental approval)</td>
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</tbody>
</table>

**Electives**

Select one of the following: 1, 2

| Ethics and scientific inquiry | 12 |
| Ethics and the environment   |    |
| Ethics, health and medicine  |    |

| Total Hours | 28 |

* Baccalaureate Core Course (BCC)

1. Three concentrations of courses to achieve the 12 elective credits for the Applied Ethics certificate have already been established, but creating an individualized program is possible

2. The Applied Ethics Certificate Coordinator will assist students in course selection from a list available in the School of History, Philosophy, and Religion

Certificate Code: C200

Applied Ethics Graduate Major (MA, MS)

Graduate Areas of Concentration

Art and morality, bioethics, environmental ethics

The MA, MS in Applied Ethics is designed to provide students with skills of moral reasoning and an understanding of ethical values and dilemmas in today’s world. Students will be able to identify, analyze and suggest solutions to ethical problems that arise in their professional and civic lives.

Students are required to take courses in ethical theory, as well as courses in applied ethics and in an appropriate disciplinary or integrated minor. Completion of the degree requires a practicum and thesis. Please note that Oregon State University also requires completion of two years of a foreign language for the master of arts degree.

Major Code: 9580

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<tr>
<th>Code</th>
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<tr>
<td>PHL 525</td>
<td>PHILOSOPHICAL METHODS</td>
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<tr>
<td>PHL 541</td>
<td>CLASSIC MORAL THEORIES</td>
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<tr>
<td>PHL 542</td>
<td>CONTEMPORARY MORAL THEORIES</td>
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</table>

**B. Applied Ethics**

Select 15 credits credits from PHL course offerings including those listed: 2

| PHL 501 | RESEARCH                           | 15    |
| PHL 502 | INDEPENDENT STUDY                  |       |
| PHL 505 | READING AND CONFERENCE             |       |
| PHL 507 | SEMINAR                            |       |
| PHL 517/WGSS 517 | FEMINIST PHILOSOPHIES    |       |
| PHL 540 | ENVIRONMENTAL ETHICS               |       |
| PHL 543/REL 543 | WORLD VIEWS AND ENVIRONMENTAL VALUES | |
| PHL 544/REL 544 | BIOMEDICAL ETHICS                |       |
| PHL 547 | RESEARCH ETHICS                    |       |
| PHL 551 | KNOWLEDGE AND REALITY              |       |
| PHL 555/REL 555 | DEATH AND DYING              |       |
| PHL 561/REL 561 | ART AND MORALITY                |       |
| PHL 570 | PHILOSOPHY OF SCIENCE              |       |
| PHL 574 | PHILOSOPHY OF BIOLOGY              |       |
| PHL 599 | TOPICS IN PHILOSOPHY               |       |

**C. Practicum**

| PHL 510 | INTERNSHIP                         | 3-6   |

**D. Thesis**

| PHL 503 | THESIS                              | 6-9   |

**E. Disciplinary or Integrated Minor**

Select 15 credits

| Total Hours | 48-54 |

1. Foreign Language requirement for MA: Passing at 200-level, test or coursework

2. Maximum of 6 credits from PHL 501, PHL 502, PHL 505

Major Code: 9580

Applied Ethics Graduate Minor

Minor Code: 9580

Minor Code: 9580

History Graduate Minor

Graduate Areas of Concentration

American history (U.S.) Western U.S. history, European history, non-American and non-European history (Asian, African, Latin American, Islamic), history of science

Graduate work in the School of History, Philosophy, and Religion may apply to the Master of Arts in Interdisciplinary Studies degree and to minors in other advanced degree programs.

Students applying for graduate work in history must meet the following requirements:
1. Minimum overall undergraduate GPA of 3.00
2. Appropriate undergraduate course work in history
3. Have Graduate Record Examination scores sent to the School of History, Philosophy, and Religion.

Minor Code: 9000

History Minor

Also available via Ecampus.

Undergraduate students may elect a minor in History to complement course work in their major discipline.

Minor Code: 900

• Courses cannot be taken for S/U credit
• Students must earn a 2.0 GPA or higher in courses applied to the minor
• History minors must complete 27 credits, of which 4 credits must be HST 310 (The Historian's Craft)
• Minor courses may be used to fulfill baccalaureate core, CLA, and minor requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Required</td>
<td>THE HISTORIAN'S CRAFT</td>
<td>4</td>
</tr>
<tr>
<td>Additional HST or HSTS credits (23) with these restrictions:</td>
<td>23</td>
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<tr>
<td>No more than 12 lower-division credits (100/200-level).</td>
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<tr>
<td>At least 12 upper-division credits (including HST 310) taken in residence at OSU (any campus).</td>
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<tr>
<td>No more than 4 blanket credits (HST 401, 402, 403, 405, 406).</td>
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<tr>
<td>No more than 4 internship (HST 410) credits.</td>
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<tr>
<td>Total Hours</td>
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<td>27</td>
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</tbody>
</table>

Minor Code: 900

History of Science Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Development of the physical, biological, and environmental sciences; history of science and medicine; intellectual and social history of science in Europe and the U.S.

The graduate program leading to the MS, MA, and PhD is offered through the School of History, Philosophy, and Religion. Graduate work in the school may apply to the Master of Arts in Interdisciplinary Studies and to minors in other advanced-degree programs.

Requirements for a Master’s Degree

Either the MA or MS may be earned. The MA requires demonstration, either by course work or examination, of a reading knowledge of a foreign language appropriate for research. Both degrees require the successful completion of 45 graduate credits. Candidates are required to have a major field of at least 24 credits of course work (including historiography) from a list of approved history of science courses and a minor field of 15 credits of course work in science, history, or a related (or integrated) field; a thesis is optional.

Requirements for a Doctoral Degree

The equivalent of three years of graduate work beyond the bachelor’s degree is required including a doctoral thesis. This must include the requirements for, or the equivalent of, a master's degree in history of science. Course work should have history of science as a major; the minor field can be in science, history, or a related (or integrated) field. Generally, one foreign language is required.

Major Code: 5440

History of Science Graduate Minor

Graduate Areas of Concentration

History of science and medicine, development of the physical, biological, and environmental sciences, intellectual and social history of science in Europe and the U.S.

Graduate work in the School of History, Philosophy, and Religion may apply to the Master of Arts in Interdisciplinary Studies and to minors in other advanced degree programs.

Students applying for graduate work in history must meet the following requirements:

1. Minimum overall undergraduate GPA of 3.00
2. Appropriate undergraduate course work in history
3. Have Graduate Record Examination scores sent to the School of History, Philosophy, and Religion

Course work in the history of science graduate major provides a critical perspective on the scientific enterprise through the centuries. It is valuable for graduate students in a variety of disciplines in the sciences and the humanities.

Admission Requirements

Students must have completed a four-year baccalaureate degree from an accredited college or university and have achieved a combined GPA of 3.00 for the last 90 quarter (60 semester) credits of graded undergraduate work of the first baccalaureate and all subsequent graded credits.

The applicant must submit photocopies of official transcripts of all previous academic work at the college or university level.

Applicants must also provide:

• A statement of the student's particular fields of interest and overall aims and purpose in the study of the history of science. An additional writing sample (no more than 25 pages) would be helpful to the graduate admissions committee.
• A photocopy of the official Graduate Record Examination (GRE) scores.
• Three letters of recommendation that specifically evaluate academic abilities and professional potential.
1. Minimum overall undergraduate GPA of 3.00
2. Appropriate undergraduate coursework in history
3. Have Graduate Record Examination scores sent to the School of History, Philosophy, and Religion.

Minor Code: 5440

Minor Code: 5440

History Undergraduate Major (BA, BS, HBA, HBS)

Also available via Ecampus.

The History undergraduate major is available to Ecampus students as a BA or BS degree only.

Major Code: 900

Minimum Total Credits (49)

Minimum Upper-Division Credits (33)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Baccalaureate Core</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select 51 credits</td>
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<tr>
<td></td>
<td>I. History Surveys</td>
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<tr>
<td></td>
<td>Select 15 credits of the following:</td>
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<tr>
<td></td>
<td>HST 101 *HISTORY OF WESTERN CIVILIZATION</td>
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<tr>
<td></td>
<td>HST 102 *HISTORY OF WESTERN CIVILIZATION</td>
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<tr>
<td></td>
<td>HST 103 *HISTORY OF WESTERN CIVILIZATION</td>
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<tr>
<td></td>
<td>HST 104 *WORLD HISTORY I: ANCIENT CIVILIZATIONS</td>
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<td></td>
<td>HST 105 *WORLD HISTORY II: MIDDLE AND EARLY MODERN AGES</td>
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<td></td>
<td>HST 106 *WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD</td>
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<td></td>
<td>HST 201 *HISTORY OF THE UNITED STATES</td>
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<td>HST 202 *HISTORY OF THE UNITED STATES</td>
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<td></td>
<td>HST 203 *HISTORY OF THE UNITED STATES</td>
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<tr>
<td></td>
<td>HST 210/PHL 210 *RELIGION IN THE UNITED STATES</td>
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<tr>
<td></td>
<td>II. Global Historical Literacy</td>
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<tr>
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<td>Select 4 upper division credits from each of the following areas:</td>
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<tr>
<td></td>
<td>European History</td>
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<td>U.S. History</td>
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<tr>
<td></td>
<td>Non-European/Non-U.S. History</td>
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<td></td>
<td>III. History Electives</td>
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<tr>
<td></td>
<td>Select 12 credits in any 300- or 400-level HST or HSTS course (Only 4 of these credits may come from HST 410)</td>
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<td></td>
<td>IV. History Capstone Courses</td>
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<tr>
<td></td>
<td>HST 310 THE HISTORIAN’S CRAFT 2</td>
<td>4</td>
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<tr>
<td></td>
<td>HST 407 *SEMINAR 2,3</td>
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</table>

Total credits required for graduation 180

1 History majors select one of the following that cover a period prior to 1800 CE: HST 101, HST 102, HST 104, HST 105 and/or HST 201.
2 A minimum grade of C is required.
3 Students must complete HST 310 before attempting.
* Baccalaureate Core Course
^ Writing Intensive Course (WIC)

Major Code: 900

Medical Humanities Certificate

Also available via Ecampus.

The undergraduate certificate in Medical Humanities offers OSU students a multi-disciplinary integrated program to study health, medicine, and the healing professions. The certificate relies on key courses in medical anthropology, literature and medicine, medical history, and biomedical ethics for its core content foundations. Courses from additional different disciplines—biology; ethnic studies; kinesiology; philosophy; political science; psychology; public health; religious studies; sociology; and women, gender, and sexuality studies—can fulfill complementary elective courses. The certificate program emphasizes skills in professional identity, reflective writing, cultural competency, and diversity as a complement to the scientific features of the healing professions. The certificate will prepare students to empathize with the sufferings of others, reflect critically on medical knowledge and discourse, create new representations of the medical experience, and confront moral, psychological, and ethical dilemmas.

For further information, please contact Courtney Campbell, 541-737-5651, ccampbell@oregonstate.edu

Current students in the Medical Humanities Certificate program should contact David Bishop, 541-737-8918, david.bishop@oregonstate.edu

Certificate Code: C868

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Required</td>
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<tr>
<td></td>
<td>Select a minimum of 10 credits from the following:</td>
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<tr>
<td></td>
<td>ANTH 345 *BIOLOGICAL AND CULTURAL CONSTRUCTIONS OF RACE</td>
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<tr>
<td></td>
<td>ANTH 383 *INTRODUCTION TO MEDICAL ANTHROPOLOGY 1</td>
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<tr>
<td></td>
<td>ENG 489/ENG 589 WRITING, LITERATURE AND MEDICINE</td>
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<tr>
<td></td>
<td>HSTS 416/HSTS 516 *HISTORY OF MEDICINE PRE-1800 1</td>
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<td>HSTS 417/HSTS 517 *HISTORY OF MEDICINE 1</td>
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<td>PHL 275 *INTRODUCTION TO DISABILITY STUDIES 1</td>
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<td>PHL 299 SELECTED TOPICS</td>
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<td>PHL 444/PHL 544 REL 444 *BIOMEDICAL ETHICS 1</td>
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<td>PHL 455/PHL 555 REL 455 DEATH AND DYING 1</td>
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<td>Electives 2</td>
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<td>Select a minimum of 17 credits from the following:</td>
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<tr>
<td></td>
<td>ANTH 240 INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY 1</td>
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<td>ANTH 345 *BIOLOGICAL AND CULTURAL CONSTRUCTIONS OF RACE</td>
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<tr>
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<td>ANTH 352 *ANTHROPOLOGY, HEALTH, AND ENVIRONMENT 1</td>
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<td>ANTH 374 *ANTHROPOLOGY AND GLOBAL HEALTH 1</td>
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<td></td>
<td>ANTH 383 *INTRODUCTION TO MEDICAL ANTHROPOLOGY 1</td>
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<tr>
<td></td>
<td>ANTH 448/ANTH 548 EVOLUTIONARY MEDICINE</td>
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<td></td>
<td>ANTH 461/ANTH 561 NEUROANTHROPOLOGY</td>
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<td>BB 331 *INTRODUCTION TO MOLECULAR BIOLOGY</td>
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<td>BB 332 *MOLECULAR MEDICINE</td>
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<td></td>
<td>BI 301 *HUMAN IMPACTS ON ECOSYSTEMS</td>
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<td></td>
<td>COMM 437 HEALTH COMMUNICATION</td>
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<tr>
<td></td>
<td>ENG 489/ENG 589 WRITING, LITERATURE AND MEDICINE</td>
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<tr>
<td></td>
<td>ENT 300/HORT 330 PLAGUES, PESTS, AND POLITICS 1</td>
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<tr>
<td></td>
<td>ES 445 *NATIVE AMERICAN SCIENCE AND TECHNOLOGY</td>
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</tbody>
</table>
Military History Minor

Also available via Ecampus.

Issues such as war and peace have continually been part of the human condition. This military history minor is designed to better inform students regarding the questions and controversies surrounding military and peace studies. It is not only for current and future military personnel, rather it is designed for all students interested not only in strategy, tactics and military technology but also for the relationship between war and peace regarding topics such gender, social and scientific movements and what it means to serve one's country.

Minor Code: 909

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<td>*HISTORY OF WESTERN CIVILIZATION</td>
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<td>HST 102</td>
<td>*HISTORY OF WESTERN CIVILIZATION</td>
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<tr>
<td>HST 103</td>
<td>*HISTORY OF WESTERN CIVILIZATION</td>
<td></td>
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<tr>
<td>HST 104</td>
<td>*WORLD HISTORY I: ANCIENT CIVILIZATIONS</td>
<td></td>
</tr>
<tr>
<td>HST 105</td>
<td>*WORLD HISTORY II: MIDDLE AND EARLY MODERN AGES</td>
<td></td>
</tr>
<tr>
<td>HST 106</td>
<td>*WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD</td>
<td></td>
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<tr>
<td>HST 201</td>
<td>*HISTORY OF THE UNITED STATES</td>
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<tr>
<td>HST 202</td>
<td>*HISTORY OF THE UNITED STATES</td>
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<tr>
<td>HST 203</td>
<td>*HISTORY OF THE UNITED STATES</td>
<td></td>
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<tr>
<td>HST 315</td>
<td>THE EUROPEAN MILITARY, 1400-1815</td>
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<tr>
<td>HST 316</td>
<td>THE AMERICAN MILITARY, 1607-1865</td>
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<tr>
<td>HST 317</td>
<td>*WHY WAR: A HISTORICAL PERSPECTIVE</td>
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<tr>
<td>HST 318</td>
<td>THE AMERICAN MILITARY, 1865-PRESENT</td>
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<tr>
<td>HST 338</td>
<td>*HITLER'S EUROPE</td>
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<tr>
<td>HST 341</td>
<td>HISTORY OF RUSSIA</td>
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<tr>
<td>HST 385</td>
<td>*THE ARAB-ISRAELI CONFLICT</td>
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<tr>
<td>HST 386</td>
<td>*MODERN IRAN: REVOLUTION AND ITS AFTERMATH</td>
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<tr>
<td>HST 425</td>
<td>*THE HOLOCAUST IN ITS HISTORY</td>
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<tr>
<td>HST 426</td>
<td>WORLD WAR I: A GLOBAL HISTORY</td>
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<tr>
<td>HST 427</td>
<td>WORLD WAR II: A GLOBAL HISTORY</td>
<td></td>
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<tr>
<td>HST 488</td>
<td>*THE UNITED STATES AND VIETNAM 1945-1995</td>
<td></td>
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<tr>
<td>HST 494</td>
<td>MODERN JAPAN: A CULTURAL HISTORY</td>
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<tr>
<td>HST 495</td>
<td>CHINA IN 20TH CENTURY</td>
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<tr>
<td>HSTS 415</td>
<td>**THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY</td>
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</tbody>
</table>

Total Hours: 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Courses available to Ecampus students earning the certificate
2 Courses taken as required 10 credits cannot also be counted as electives

Certificate Code: C868

Peace Studies Certificate

For more information, contact the program director.
Joseph A. Orosco, Director
102D Hovland Hall
Oregon State University
Corvallis, OR 97331-3902
541-737-4335
Email: joseph.orosco@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/shpr/academic-programs/certificate-programs/peace-studies-certificate-requirements/ (http://liberalarts.oregonstate.edu/shpr/academic-programs/certificate-programs/peace-studies-certificate-requirements/)

Certificate Code: C815

To earn the undergraduate Peace Studies certificate, students must complete a minimum of 30 credits consisting of 12 credits from the PAX core courses and 18 credits of elective courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PAX 201</td>
<td>STUDY OF PEACE AND THE CAUSES OF CONFLICT</td>
<td>3</td>
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<tr>
<td>Select at least 9 credits from the following:</td>
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<tr>
<td>ANTH 380</td>
<td>CULTURES OF CONFLICT</td>
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<tr>
<td>COMM 440/COMM 540</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>HST 317</td>
<td>WHY WAR: A HISTORICAL PERSPECTIVE</td>
<td></td>
</tr>
<tr>
<td>PHL 344</td>
<td>PACIFISM, JUST WAR, AND TERRORISM</td>
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<tr>
<td>PS 205</td>
<td>INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td></td>
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</tbody>
</table>

Electives
Select 18 credits from the following areas:

- Peace, Research and Practice
- Communication and Peace
- Economics and Peace
- Ethics and Peace
- History and Peace
- Inequality and Peace
- Politics and Peace

Total Hours 30

* Baccalaureate Core Course (BCC)

Certificate Code: C815

Philosophy Graduate Minor

Graduate Areas of Concentration

Aesthetic theory, ethics (including environmental ethics and biomedical ethics), history of philosophy, logic and philosophy of science, religious studies

The School of History, Philosophy, and Religion is committed to teaching students the skills and knowledge they need to reason cogently and decide wisely about difficult issues they will confront as citizens and professionals. The school offers graduate work leading to the Master of Arts in Interdisciplinary Studies degree with a specialization in applied ethics and in other areas of philosophy and religious studies. The MAIS thesis option is encouraged. The study of applied ethics builds on a special strength among school faculty.

Graduate credit is offered in logic, ethics (including environmental ethics and biomedical ethics), aesthetics, religious studies, philosophy of science, contemporary philosophy, and history of philosophy. PHL 550 is offered in conjunction with the 'IDEAS MATTER' lecture series.

Prospective students should request additional program literature from the school. Some teaching assistantship support is available.

Minor Code: 955

Philosophy Minor

The Philosophy minor allows students to specialize in such areas as ethics, legal and political philosophy, philosophy and religion, non-Western philosophies and religious ideas, philosophy of art, logic, philosophy of science, and the history of philosophy.

Minor Code: 955

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PHL 301</td>
<td>HISTORY OF WESTERN PHILOSOPHY</td>
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<tr>
<td>PHL 302</td>
<td>HISTORY OF WESTERN PHILOSOPHY</td>
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</tr>
<tr>
<td>PHL 303</td>
<td>HISTORY OF WESTERN PHILOSOPHY</td>
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</tbody>
</table>

Logic
Select one course from the following: 3-4

- PHL 101 | CRITICAL THINKING                                      |       |
- PHL 121 | REASONING AND WRITING                                   |       |
- PHL 321 | DEDUCTIVE LOGIC                                        |       |
- PHL 325 | SCIENTIFIC REASONING                                   |       |
- PHL 421 | MATHEMATICAL LOGIC                                     |       |

Concentration
Select a minor area of concentration with approval of a faculty advisor

Electives
Select as many as needed to complete the total credit requirement and must include 12 credits of upper division with at least 3 credits at the 400 level

Total credits required for minor 1 27

* Baccalaureate Core Course

1 A grade of C– or better is required in all courses used to complete minor requirements. Only one elective may be taken with S/U grading

Minor Code: 955

Philosophy Undergraduate Major (BA, BS, HBA, HBS)

Also available via Ecampus.

An undergraduate major in philosophy provides a broad education and intellectual skills that are useful in many occupations and areas of life. It is also a valuable background for graduate study in philosophy and religious studies and for advanced study in such professional fields as law and public service.

Major Code: 955

- At least 44 total credits of PHL courses.
- At least 24 credits must be upper division.
No courses used to satisfy the requirements of major may be taken S/U.

Only courses with C− or better will be accepted for the major.

Students must have a 2.5 GPA in those courses used to satisfy the requirements of the major.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PHL 121</td>
<td>*REASONING AND WRITING</td>
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<tr>
<td>PHL 201</td>
<td>*INTRODUCTION TO PHILOSOPHY</td>
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</tr>
<tr>
<td>PHL 203</td>
<td>*THE MEANING OF EXISTENCE</td>
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</tr>
<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
<td></td>
</tr>
<tr>
<td>PHL 207</td>
<td>*POLITICAL PHILOSOPHY</td>
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</tr>
<tr>
<td>PHL 208/REL 208</td>
<td>INTRODUCTION TO BUDDHIST TRADITIONS</td>
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</tr>
<tr>
<td>PHL 213/REL 213</td>
<td>*INTRODUCTION TO HINDU TRADITIONS</td>
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<tr>
<td>PHL 251</td>
<td>*KNOWERS, KNOWING, AND THE KNOWN</td>
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<tr>
<td>PHL 280</td>
<td>*ETHICS OF DIVERSITY</td>
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<tr>
<td>PHL 301</td>
<td>*HISTORY OF WESTERN PHILOSOPHY</td>
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<tr>
<td>PHL 321</td>
<td>DEDUCTIVE LOGIC</td>
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</tr>
<tr>
<td>PHL 443/REL 443</td>
<td>*WORLD VIEWS AND ENVIRONMENTAL VALUES</td>
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<tr>
<td>PHL 444/REL 444</td>
<td>*BIOMEDICAL ETHICS</td>
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</table>

Students must take at least one PHL course with a WIC designation (e.g. PHL 407, PHL 474)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PHL 213/REL 213</td>
<td>*INTRODUCTION TO HINDU TRADITIONS</td>
<td>3-4</td>
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<tr>
<td>PHL 214/REL 214</td>
<td>*INTRODUCTION TO ISLAMIC TRADITIONS</td>
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<tr>
<td>PHL 275</td>
<td>*INTRODUCTION TO DISABILITY STUDIES</td>
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<tr>
<td>PHL 280</td>
<td>*ETHICS OF DIVERSITY</td>
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<tr>
<td>PHL 312/REL 312</td>
<td>*ASIAN THOUGHT</td>
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<tr>
<td>PHL 316/REL 316</td>
<td>INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS</td>
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<tr>
<td>PHL 345/REL 345</td>
<td>*FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE</td>
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<tr>
<td>PHL 371/REL 371</td>
<td>*PHILOSOPHY OF CHINA</td>
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<td>PHL 360</td>
<td>*PHILOSOPHY AND THE ARTS</td>
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<tr>
<td>PHL 417/WS 417</td>
<td>FEMINIST PHILOSOPHIES</td>
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<tr>
<td>PHL 430/REL 430</td>
<td>HISTORY OF BUDDHIST PHILOSOPHY</td>
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<tr>
<td>PHL 448/ES 448/ REL 448</td>
<td>NATIVE AMERICAN PHILOSOPHIES</td>
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<td>PHL 160</td>
<td>*QUESTS FOR MEANING: WORLD RELIGIONS</td>
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<tr>
<td>PHL 202</td>
<td>INTRODUCTION TO RELIGIOUS STUDIES</td>
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Select 8 credits from the following lower division courses:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>PHL 170</td>
<td>*THE IDEA OF GOD</td>
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<tr>
<td>PHL 205</td>
<td>*RELIGIOUS ETHICS AND MORAISON PROBLEMS</td>
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</tr>
<tr>
<td>PHL 208</td>
<td>INTRODUCTION TO BUDDHIST TRADITIONS</td>
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<tr>
<td>PHL 210/HST 210</td>
<td>RELIGION IN THE UNITED STATES</td>
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<tr>
<td>PHL 213</td>
<td>*INTRODUCTION TO HINDU TRADITIONS</td>
<td></td>
</tr>
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<td>PHL 214</td>
<td>*INTRODUCTION TO ISLAMIC TRADITIONS</td>
<td></td>
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<tr>
<td>PHL 407</td>
<td>*WORLD VIEWS AND VALUES IN THE BIBLE</td>
<td></td>
</tr>
<tr>
<td>REL 215</td>
<td>*INTRODUCTION TO JEWISH TRADITIONS</td>
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Select 8 credits from the following upper division courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>HST 325</td>
<td>*EARLY CHRISTIANITY: ORIGINS TO 600</td>
<td>8</td>
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<tr>
<td>HST 350</td>
<td>*MODERN LATIN AMERICA</td>
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<tr>
<td>HST 352</td>
<td>*AFRICA IN LATIN AMERICAN HISTORY</td>
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<tr>
<td>HST 387</td>
<td>*ISLAMIC CIVILIZATION</td>
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<tr>
<td>HST 388</td>
<td>*ISLAMIC CIVILIZATION</td>
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</tr>
<tr>
<td>HST 425</td>
<td>*THE HOLOCAUST IN ITS HISTORY</td>
<td></td>
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<tr>
<td>HST 466</td>
<td>RELIGION AND U.S. FOREIGN RELATIONS</td>
<td></td>
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<tr>
<td>HST 485</td>
<td>*POLITICS AND RELIGION IN THE MODERN MIDDLE EAST</td>
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</tr>
<tr>
<td>PHL 312</td>
<td>*ASIAN THOUGHT</td>
<td></td>
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<tr>
<td>PHL 315</td>
<td>*GANDHI AND NONVIOLENCE</td>
<td></td>
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<tr>
<td>PHL 344</td>
<td>*PACIFISM, JUST WAR, AND TERRORISM</td>
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<tr>
<td>PHL 345</td>
<td>*FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE</td>
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<tr>
<td>PHL 371</td>
<td>*PHILOSOPHIES OF CHINA</td>
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<tr>
<td>PHL 430</td>
<td>HISTORY OF BUDDHIST PHILOSOPHY</td>
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<tr>
<td>PHL 431</td>
<td>BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE</td>
<td></td>
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<tr>
<td>PHL 432</td>
<td>*YOGA AND TANTRIC TRADITIONS</td>
<td></td>
</tr>
<tr>
<td>PHL 436</td>
<td>PHILOSOPHY AND RELIGION</td>
<td></td>
</tr>
<tr>
<td>PHL 443</td>
<td>*WORLD VIEWS AND ENVIRONMENTAL VALUES</td>
<td></td>
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<tr>
<td>PHL 444</td>
<td>*BIOMEDICAL ETHICS</td>
<td></td>
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<tr>
<td>PHL 455</td>
<td>DEATH AND DYING</td>
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<tr>
<td>PHL 461</td>
<td>ART AND MORALITY</td>
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Select four credits from the following:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Any HST, PHL, REL course, or special topics as approved by academic advisor.</td>
<td>4</td>
<td></td>
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</tbody>
</table>

Total Hours 28

* Baccalaureate Core Course
^ Writing Intensive Course (WIC)

Minor Code: 978

Religious Studies Undergraduate Major (BA, BS, HBA, HBS)

Also available via Ecampus.

The School of History, Philosophy, and Religion offers a BA or BS degree in Religious Studies as well as a minor in Religious Studies, and an undergraduate certificate in medical humanities. Courses emphasize skills in critical thinking, argumentative and expository writing, cultural literacy, citizenship, and global diversity. Majors in religious studies pursue graduate studies and careers in numerous fields, including education, government, humanitarian services, journalism, law, medicine, and politics.
Major Code: 977

Required Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>REL 160/PHL 160</td>
<td>QUEST FOR MEANING: WORLD RELIGIONS ¹</td>
<td>4</td>
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<tr>
<td>REL 202/PHL 202</td>
<td>INTRODUCTION TO RELIGIOUS STUDIES ¹</td>
<td>4</td>
</tr>
<tr>
<td>REL 407</td>
<td>*SEMINAR ¹</td>
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</table>

Global Literacy in Religion

Select 12 credits of the following: 12

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>REL 206/PHL 206</td>
<td>RELIGIOUS ETHICS AND MORAL PROBLEMS</td>
<td></td>
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<tr>
<td>REL 208/PHL 208</td>
<td>INTRODUCTION TO BUDDHIST TRADITIONS ¹</td>
<td></td>
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<tr>
<td>REL 210/PHL 210</td>
<td>RELIGION IN THE UNITED STATES ¹</td>
<td></td>
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<tr>
<td>HST 210</td>
<td></td>
<td></td>
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<tr>
<td>REL 213/PHL 213</td>
<td>INTRODUCTION TO HINDU TRADITIONS ¹</td>
<td></td>
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<tr>
<td>REL 214/PHL 214</td>
<td>INTRODUCTION TO ISLAMIC TRADITIONS ¹</td>
<td></td>
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<tr>
<td>REL 215/HST 215</td>
<td>INTRODUCTION TO JEWISH TRADITIONS</td>
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<tr>
<td>REL 220/PHL 220</td>
<td>WORLD-VIEWS AND VALUES IN THE BIBLE ¹</td>
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</table>

Studies in Religion and Culture

Select 24 credits from courses below. 12 credits must come from courses in the School of History, Philosophy, and Religion (SHPR): 12

SHPR Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HST 486</td>
<td>A HISTORY OF CHRISTIANITY IN AFRICA</td>
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<tr>
<td>HSTS 423</td>
<td>SCIENCE AND RELIGION</td>
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<tr>
<td>REL 170/PHL 170</td>
<td>THE IDEA OF GOD ¹</td>
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<tr>
<td>REL 199</td>
<td>SPECIAL TOPICS</td>
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<tr>
<td>REL 201/PAX 201</td>
<td>STUDY OF PEACE AND THE CAUSES OF CONFLICT ¹</td>
<td></td>
</tr>
<tr>
<td>REL 299</td>
<td>SPECIAL TOPICS</td>
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<tr>
<td>REL 310/PHL 310</td>
<td>CRITICS OF RELIGION</td>
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</tr>
<tr>
<td>REL 312/PHL 312</td>
<td>ASIAN THOUGHT ¹</td>
<td></td>
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<tr>
<td>REL 315/PHL 315</td>
<td>GANDHI AND NONVIOLENCE ¹</td>
<td></td>
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<tr>
<td>REL 316/PHL 316</td>
<td>INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS</td>
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<tr>
<td>REL 324/HST 324</td>
<td>ANCIENT JEWISH HISTORY</td>
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<tr>
<td>REL 325/HST 325</td>
<td>EARLY CHRISTIANITY ORIGINS TO 600</td>
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<tr>
<td>REL 327/HST 327</td>
<td>HISTORY OF MEDIEVAL EUROPE</td>
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<tr>
<td>REL 328/HST 328</td>
<td>HISTORY OF MEDIEVAL EUROPE ¹</td>
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<tr>
<td>REL 330/HST 330</td>
<td>HISTORY OF EARLY MODERN EUROPE</td>
<td></td>
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<tr>
<td>REL 333/HST 333</td>
<td>MEDIEVAL AND EARLY MODERN SPANISH HISTORY</td>
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<tr>
<td>REL 344/PHL 344</td>
<td>PACIFISM, JUST WAR, AND TERRORISM</td>
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<tr>
<td>REL 345/PHL 345</td>
<td>FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE</td>
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<tr>
<td>REL 350/HST 350</td>
<td>MODERN LATIN AMERICA ¹</td>
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<td>REL 352/HST 352</td>
<td>AFRICANS IN LATIN AMERICAN HISTORY</td>
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<tr>
<td>REL 364/HST 364</td>
<td>UNITED STATES RELIGION AND SOCIAL REFORM ¹</td>
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<tr>
<td>REL 371/PHL 371</td>
<td>PHILOSOPHIES OF CHINA</td>
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<tr>
<td>REL 387/HST 387</td>
<td>ISLAMIC CIVILIZATION</td>
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<td>REL 388/HST 388</td>
<td>ISLAMIC CIVILIZATION</td>
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<tr>
<td>REL 399</td>
<td>SPECIAL TOPICS</td>
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<td>REL 402</td>
<td>INDEPENDENT STUDY</td>
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<td>REL 405</td>
<td>READING AND CONFERENCE</td>
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<tr>
<td>REL 411/PHL 411</td>
<td>GREAT FIGURES IN PHILOSOPHY</td>
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<tr>
<td>REL 415</td>
<td>SELECTED TOPICS</td>
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<td>REL 425/HST 425</td>
<td>THE HOLOCAUST IN ITS HISTORY ¹</td>
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<tr>
<td>REL 430/PHL 430</td>
<td>HISTORY OF BUDDHIST PHILOSOPHY</td>
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<tr>
<td>REL 431/PHL 431</td>
<td>BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE</td>
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<td>REL 432</td>
<td>YOGA AND TANTRIC TRADITIONS</td>
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<tr>
<td>REL 433/PHL 433</td>
<td>THEORY AND PRACTICE OF MODERN YOGA</td>
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<tr>
<td>REL 434/PHL 434</td>
<td>SPIRITUALITY AND ECOLOGY GREEN YOGA</td>
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<tr>
<td>REL 436/PHL 436</td>
<td>PHILOSOPHY AND RELIGION</td>
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<tr>
<td>REL 443/PHL 443</td>
<td>WORLD VIEWS AND ENVIRONMENTAL VALUES ¹</td>
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<tr>
<td>REL 444/PHL 444</td>
<td>BIOMEDICAL ETHICS ¹</td>
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Non-SHPR Courses

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ANTH 452</td>
<td>FOLKLORE AND EXPRESSIVE CULTURE</td>
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<tr>
<td>ANTH 472</td>
<td>CONTEMPORARY INDIAN ISSUES</td>
<td></td>
</tr>
<tr>
<td>ENG 275</td>
<td>*THE BIBLE AS LITERATURE ¹</td>
<td></td>
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<tr>
<td>ENG 295/PHL 295</td>
<td>FEMINISM AND THE BIBLE</td>
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<tr>
<td>WGS 295</td>
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<tr>
<td>ENG 330</td>
<td>*THE HOLOCAUST IN LITERATURE AND FILM</td>
<td></td>
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<tr>
<td>ENG 360</td>
<td>NATIVE AMERICAN LITERATURE</td>
<td></td>
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<tr>
<td>PS 361</td>
<td>CLASSICAL POLITICAL THOUGHT ¹</td>
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<tr>
<td>PS 370</td>
<td>SCIENCE, RELIGION, AND POLITICS ¹</td>
<td></td>
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<tr>
<td>SOC 452</td>
<td>SOCIOLOGY OF RELIGION</td>
<td></td>
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<tr>
<td>WGS 223</td>
<td>INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES ¹</td>
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<tr>
<td>WGS 380</td>
<td>MUSLIM WOMEN ¹</td>
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<tr>
<td>WGS 495</td>
<td>*GLOBAL FEMINIST THEOLOGIES ¹</td>
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<tr>
<td>WGS 496</td>
<td>FEMINIST THEOLOGIES IN THE UNITED STATES</td>
<td></td>
</tr>
</tbody>
</table>

Total credits required for graduation 180

* Baccalaureate Core Course
^ Writing Intensive Course (WIC)
¹ Courses offered online via Ecampus

Major Code: 977

School of Language, Culture, and Society

Anthropology

Anthropology offers courses to meet the needs of students interested in a comprehensive understanding of human societies and cultures past and present. Prehistoric, historic, ethnographic, and linguistic study provides the basis for understanding how a variety of societies solve common problems. The anthropology curriculum provides a cross-cultural perspective, a sound basis for later professional or graduate education.

An anthropology degree enables students to pursue a broad range of jobs requiring a liberal arts background; for example, education, human and governmental services, law, business, media, and medicine. It prepares them especially well for work situations that emphasize cross-cultural awareness, international contacts, and management of cultural resources.

Anthropology bridges sciences and the humanities and develops critical thinking, communication skills, facility with group processes, and the ability to work independently. It can help students succeed in an increasingly interconnected and complex world.

Ethnic Studies

Ethnic studies is an established academic discipline traditionally defined by a concentration on the experiences and concerns of the four major ethnic minority groups historically under-represented in United States political and institutional life and in university curricula.
Ethnic studies faculty bring a variety of methodological approaches to bear on the exploration of issues affecting African American, Asian American, Chicano/a-Latino/a, and American Indian and Alaskan Native communities. A degree in ethnic studies provides a sound basis for future work in graduate or professional programs and is of value to students interested in careers in a broad range of jobs requiring a liberal arts background and an understanding of race, ethnicity, and cultural competency.

**World Languages**

World languages and cultures (WLC) offers major programs leading to a BA degree in French, German, or Spanish, as well as minor programs in Asian Languages and Cultures, French, German, and Spanish for undergraduate students with majors in other disciplines. The major and minor programs provide students with the opportunity to develop language skills and to raise their understanding of and appreciation for world literatures and cultures.

Proficiency in a world language and knowledge of another culture can enhance career possibilities in fields that range from business, library work, and government service to park service, oceanography, agriculture, and forestry. Students often find it possible to combine languages with another major such as business administration, psychology, political science, sociology, and professional training to prepare for an exciting, internationally oriented career.

Study of a language other than English can help students improve communication skills in English, become more linguistically aware, develop analytical skills, and communicate on an equal basis with non-English-speaking people. Through language courses, students can gain a global perspective, more fully understand different cultures and value systems, and enhance their general knowledge of world development.

An undergraduate academic major (French, German, or Spanish) is required as a prerequisite to the Fifth-Year Teacher Education Program designed to prepare students for licensure and/or other graduate programs in education.

WLC cooperates with institutions of the Oregon University System and with other Northwest institutions of higher education in administering overseas study centers at Beijing and Fujian, China; Quito, Ecuador; Angers, Lyon, and Poitiers, France; Baden-Wurttemberg and Cologne, Germany; Tokyo, Japan; Seoul, Korea; Puebla, Mexico; Santander, Oviedo, and Segovia, Spain. Students may also study at different institutions in Russia and in the former Soviet republics. See the International Programs section of this catalog.

**Liberal Studies**

The BA degree in Liberal Studies offers area studies that allow students to use language and culture courses taken in the School of Language, Culture, and Society to fulfill core course requirements. Students majoring in liberal studies can elect to complete their undergraduate degree using prestructured programs in the following areas: Asian studies, Chinese studies, European studies and Japanese studies.

A minimum of 45 credits of course work in the concentration area is required to complete the Liberal Studies major.

**Women, Gender, and Sexuality Studies**

The Women, Gender, and Sexuality Studies Program at OSU relies on multi-disciplinary approaches to the study of gender and sexuality, particularly as they intersect with race, ethnicity, class, culture, religion, nation, and ability. Our program emphasizes academic excellence, the use of feminist and anti-racist pedagogies, and scholarship that contributes to social change and justice. We are committed to challenging all forms of oppression, and we center queer, transnational, and women of color feminisms in our curriculum. We encourage creative, innovative, and collaborative frameworks of study, and we work to meet the needs of a wide range of students, developing curriculum that is meaningful for students who wish to pursue careers in academia, as well as those who may be interested in community organizing, feminist nonprofit work, and/or other professional areas. The Women, Gender, and Sexuality Studies Program offers an undergraduate major, minor, and certificate, as well as the MA in Women, Gender, and Sexuality Studies and the opportunity to declare Women, Gender, and Sexuality Studies as a primary and/or secondary area in the MAIS. We also offer undergraduate and graduate minors in Queer Studies.

**Certificate Programs**

The School of Language, Culture, and Society participates in the Languages in Culture and Latin American Affairs certificate programs. These interdisciplinary programs are designed for students who wish to combine their school major with a broad knowledge of Latin American or Russian affairs, past and present, or who wish to explore how languages and cultures interact. Core courses are typically taken in language, in the humanities and social sciences.

**Graduate Programs**

The School of Language, Culture, and Society offers master’s of arts and doctor of philosophy degrees in Applied Anthropology, College Student Services Administration; Contemporary Hispanic Studies; and Women, Gender, and Sexuality Studies. Graduate minors are offered in Anthropology; Applied Anthropology; Contemporary Hispanic Studies; Ethnic Studies; Food in Culture and Social Justice; Foreign Languages and Literatures; and Women, Gender, and Sexuality Studies.

Students may earn the Master of Arts in Interdisciplinary Studies (MAIS) degree in the areas of anthropology, applied anthropology, ethnic studies, foreign languages and literatures, French, German, Spanish, and women studies. Typically, candidates who select French, German or Spanish as one of their primary areas complete graduate course work in language, linguistics, literature and culture studies. To be admitted to a world language component of the MAIS degree, students must meet the Graduate School’s general entrance requirements and obtain the consent of a graduate faculty member of the School of Language, Culture, and Society who agrees to serve as the field advisor. A maximum of 6 graduate credits completed at an overseas study center may be used to satisfy requirements for any one of three fields of the MAIS degree.

**Undergraduate Programs**

**Majors**

- Anthropology (p. 736)
  - Options:
    - Archaeology
    - Biocultural Option
    - Cultural/Linguistic
    - General Anthropology
  - Ethnic Studies (p. 741)
  - French (p. 743)
  - German (p. 744)
Minors
• Anthropology (p. 735)
• Asian Languages and Cultures (p. 739)
• Ethnic Studies (p. 740)
• French (p. 742)
• German (p. 744)
• Global Development Studies (p. 744)
• Queer Studies (p. 747)
• Social Justice (p. 747)
• Spanish (p. 748)
• Women, Gender, and Sexuality Studies (p. 751)

Certificates
• Food in Culture and Social Justice (p. 741)
• Language in Culture (p. 745)
• Latin American Affairs (p. 746)
• Women, Gender, and Sexuality Studies (p. 748)

Graduate Programs
Majors
• Applied Anthropology (p. 737)
• College Student Services Administration (p. 739)
• Women, Gender, and Sexuality Studies (p. 749)

Minors
• Anthropology (p. 735)
• Applied Anthropology (p. 738)
• Ethnic Studies (p. 740)
• Food in Culture and Social Justice (p. 742)
• Foreign Languages and Literatures (p. 742)
• Queer Studies (p. 746)
• Women, Gender, and Sexuality Studies (p. 750)

Susan Bernardin, Director
203 Waldo Hall
Oregon State University
Corvallis, OR 97331-4603
Phone: 541-737-2759
Email: susan.bernardin@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/slcs

Faculty
Professors Brauner, Gross, Krause, Lee, Price, Rivera-Mills, Shaw, Wood
Associate Professors Boudraa, Cheyney, Davis, Driskill, Duncan, Heiduschke, Maldonado, Minc, Mize, Osei-Kofi, Sakurai, Thompson, Tilt, Yu
Assistant Professors Barnd, Boovy, Carpena-Mendez, Gerkey, Herrera, Lopez-Cevallos, K. Maes, Shirazi, Trujillo
Senior Instructors Chavarria, Escala, Freehling-Burton, McCullough, Nakajima, Nolan, Palacios, Rolston, Warren
Instructors Cunningham, Davis-Malewitz, Detar, Druckenmiller, Ehlers, Esterberg, Floyd, Freeman, Ho, Kim, Krebs, Kudlacek, Lazzaretti, C.

Anthropology
ANTH 101. *INTRODUCTION TO ANTHROPOLOGY. (3 Credits)
Located at the intersection of the humanities and the sciences, anthropology strives for a holistic understanding of the human condition. This course introduces students to the basic concepts, theories and methods of anthropology, including its four main sub-fields: archaeology, biological anthropology, cultural anthropology, and linguistic anthropology. The course is driven by fundamental questions, including: What is culture? How do anthropologists study human populations, both past and present? How can this field help us better understand contemporary human problems? (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

ANTH 110. *INTRODUCTION TO CULTURAL ANTHROPOLOGY. (3 Credits)
Investigates cultural adaptation and change in different environmental and historical contexts. Compares the means by which cultures solve common human problems. Shows similarities and differences throughout the world in systems of values, family, religion, economics, and politics. Students are asked to consider future cultural conditions. Uses a video format. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

ANTH 159. *LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION. (4 Credits)
Unpack language, race and racism--as well as the intersections between those ideas-- as cornerstones to understanding identity and society as inherently socially constructed notions. CROSSLISTED as ANTH 159/ES 159/WLC 159. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 159, WLC 159

ANTH 199. SPECIAL STUDIES. (1-3 Credits)
Equivalent to: ANTH 199H
This course is repeatable for 3 credits.

ANTH 208. *WESTERN CULTURE STUDY ABROAD. (3 Credits)
Overseas study of the history and contemporary form of important features of Western culture. Based on at least 10 weeks of studying abroad. CROSSLISTED as ANTH 208/LING 208. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: LING 208

ANTH 209. *CULTURAL DIVERSITY STUDY ABROAD. (3 Credits)
Overseas study of non-Western cultures. Based on at least 10 weeks of studying abroad. CROSSLISTED as ANTH 209/LING 209. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: LING 209

ANTH 210. *COMPARATIVE CULTURES. (3 Credits)
Compares the cultures originating in Asia, Africa, and precolonial Australia, Oceania, and North and South America. Introduces method and theory for comparative cultural analysis from historical, ethnographic, and indigenous viewpoints. Considers the contribution and influences of minority and ethnic groups on the mainstream culture in nation states. Summarizes the characteristics of cultures in the major world culture areas. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: ANTH 210H
ANTH 230. TIME TRAVELERS. (3 Credits)
Introduction to the historical developments of modern archaeology. The
often romanticized public image of archaeology will be contrasted with
scientific reality. The nature of archaeological data, modern field methods,
analytical techniques, and theoretical background will be reviewed in
order to illustrate how the unwritten record of human cultural behavior is
deciphered. (SS)
Attributes: LACS – Liberal Arts Social Core

ANTH 240. INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY. (3 Credits)
An investigation of the origin of modern people (Homo sapiens) in a
historical context; review of key discoveries and current research on
the relationships between humans and other primates; exploration of
contrasting views of humanity. (SS)
Attributes: LACS – Liberal Arts Social Core

ANTH 251. *LANGUAGE IN THE USA. (3 Credits)
Examines the linguistic aspects of ethnic, class, and gender differences
in the United States of America, with a focus on language attitudes.
Uses both oral and written materials and quantitative and qualitative
approaches. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ANTH 251H

ANTH 251H. *LANGUAGE IN THE USA. (3 Credits)
Examines the linguistic aspects of ethnic, class, and gender differences
in the United States of America, with a focus on language attitudes.
Uses both oral and written materials and quantitative and qualitative
approaches. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator
Equivalent to: ANTH 251

ANTH 261. *FOOD IN AMERICAN CULTURE. (3 Credits)
Fosters understanding of the meanings of foods and foodways in
American culture. Uses food as a lens to explore general topic areas such
as work, family, ecology, and identity. Critically examines core issues that
shape and have shaped American culture. CROSSLISTED as ANTH 261/
FCSJ 261. (Bacc Core Course) (SS)
Attributes: CPWC – Core, Pers, West Culture; LACS – Liberal Arts Social Core
Equivalent to: FCSJ 261

ANTH 284. *PRIMATE ADAPTATION AND EVOLUTION. (4 Credits)
Introduces students to our closest living relatives, the primates. Uses
theories and concepts from evolutionary biology to explore the diverse
anatomical and behavioral adaptations of different primate species. Also
explores the relationships between anatomy, behavior, and ecology on the
individual and community level. Provides an evolutionary and ecological
framework with which to view primates (including humans) and all living
organisms. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

ANTH 311. *PEOPLES OF THE WORLD-NORTH AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history,
ecological adaptations, population, family and gender roles, religious
ideology, political and economic systems, modern social changes, and
contemporary issues pertaining to indigenous peoples in culturally
distinct regions of the world. Emphasis is placed on dispelling stereotypic
images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 311H
Recommended: ANTH 110 or ANTH 210 or completion of social
processes and institutions requirement.

ANTH 311H. *PEOPLES WORLD-NORTH AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history,
ecological adaptations, population, family and gender roles, religious
ideology, political and economic systems, modern social changes, and
contemporary issues pertaining to indigenous peoples in culturally
distinct regions of the world. Emphasis is placed on dispelling stereotypic
images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 311
Recommended: ANTH 110 or ANTH 210 or completion of social
processes and institutions requirement.

ANTH 312. *PEOPLES WORLD-EUROPE. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history,
ecological adaptations, population, family and gender roles, religious
ideology, political and economic systems, modern social changes, and
contemporary issues pertaining to indigenous peoples in culturally
distinct regions of the world. Emphasis is placed on dispelling stereotypic
images, both past and present. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: ANTH 312H
Recommended: ANTH 110 or ANTH 210 or completion of social
processes and institutions requirement.

ANTH 312H. *PEOPLES WORLD-EUROPE. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history,
ecological adaptations, population, family and gender roles, religious
ideology, political and economic systems, modern social changes, and
contemporary issues pertaining to indigenous peoples in culturally
distinct regions of the world. Emphasis is placed on dispelling stereotypic
images, both past and present. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: ANTH 312
Recommended: ANTH 110 or ANTH 210 or completion of social
processes and institutions requirement.

ANTH 313. *PEOPLES OF THE WORLD-LATIN AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history,
ecological adaptations, population, family and gender roles, religious
ideology, political and economic systems, modern social changes, and
contemporary issues pertaining to indigenous peoples in culturally
distinct regions of the world. Emphasis is placed on dispelling stereotypic
images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 313H
Recommended: ANTH 110 or ANTH 210 or completion of social
processes and institutions requirement.

ANTH 313H. *PEOPLES OF THE WORLD-LATIN AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history,
ecological adaptations, population, family and gender roles, religious
ideology, political and economic systems, modern social changes, and
contemporary issues pertaining to indigenous peoples in culturally
distinct regions of the world. Emphasis is placed on dispelling stereotypic
images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 313
Recommended: ANTH 110 or ANTH 210 or completion of social
processes and institutions requirement.
ANTH 314. *PEOPLES OF THE WORLD-MIDDLE EAST. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 314H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 314H. *PEOPLES OF THE WORLD-MIDDLE EAST. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 314
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 315. *PEOPLES OF THE WORLD-AFRICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 315H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 315H. *PEOPLES OF THE WORLD-AFRICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 315
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 316. *PEOPLES OF THE WORLD-SOUTH AND SOUTHEAST ASIA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 317. *PEOPLES OF THE WORLD-PACIFIC. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 317H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 318. *PEOPLES OF THE WORLD-CHINA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Prerequisites: ANTH 110 with D- or better or ANTH 210 with D- or better
Equivalent to: ANTH 318
Recommended: Completion of social processes and institutions requirement

ANTH 319. *PEOPLES OF THE WORLD-JAPAN AND KOREA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 330. *EVOLUTION OF PEOPLE, TECHNOLOGY, AND SOCIETY. (3 Credits)
Overview of the evolution and prehistory of the human species, including the development and interaction of human biology, technology, and society. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACS – Liberal Arts Social Core
Equivalent to: ANTH 330H
ANTH 331. MESOAMERICAN PREHISTORY. (3 Credits)
Explores the archaeology and prehistory of Mesoamerica from Paleol–Indian times through the Olmec, Maya, Zapotec, and Aztec cultures to the Spanish Conquest. Themes include the transition to settled agriculture, emergence of social inequality and political authority, the role of the natural environment, and the rich cultural heritage of Mesoamerican civilizations.
Attributes: LACN – Liberal Arts Non-Western Core
Recommended: Understanding of the fundamentals of archaeology

ANTH 332. ARCHAEOLOGICAL INFERENCE. (4 Credits)
In this course on archaeological inference, or the thought process of forming our understanding about the past, we will take a guided tour of the main stages of archaeological research design and try our hand at making archaeological inferences. We begin by learning about the basic conceptual problems in the study of the past, then, we engage with the theories and models used to address them, and finally we apply this knowledge in hands-on analytical activities during the laboratory sessions with archaeological artifacts. Lec/lab.
Prerequisites: ANTH 230 with D- or better

ANTH 345. *BIOLOGICAL AND CULTURAL CONSTRUCTIONS OF RACE. (3 Credits)
The social, cultural, and historical context of human biological diversity in the United States. Students become acquainted with primary resources relating to biological diversity within the modern human species and will offer a critical perspective on racial/ethnic categorization of that diversity. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ANTH 345H
Recommended: Sophomore standing and completion of one anthropology course.

ANTH 350. LANGUAGE, CULTURE AND SOCIETY. (4 Credits)
An examination of the communicative functions of language and the role of language in the construction of social relations. Covers the origins, structure, and diversity of language. Explores the relationships between language and thought and the use of linguistic models in the study of culture. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: 3 credits of social science.

ANTH 352. *ANTHROPOLOGY, HEALTH, AND ENVIRONMENT. (3 Credits)
Major threats to human health are increasingly linked to global environmental changes. This course engages medical and environmental anthropology research to critically explore the values, meanings and ideologies associated with ecological and public health issues in given localities throughout the world. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

ANTH 361. *FOOD JUSTICE. (4 Credits)
Contemporary food systems are examined from a cultural and social justice perspective. The human right to food as recognized by the United Nations serves as the justice grounding point. Impediments to realizing the right to food will be examined in national and international contexts.
CROSSLISTED as ANTH 361/FCSJ 361. (Bacc Core Course) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Equivalent to: FCSJ 361

ANTH 370. *ANTHROPOLOGICAL THEORIES. (4 Credits)
Foundational theories, approaches, and concepts are explored and used as a means to understanding how anthropologists past and present use theory. Students compare and contrast prominent theories, analyze current events and situations, and write a major research paper using anthropological sources.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ANTH 110 with D- or better
Recommended: Completion of social processes and institutions requirement

ANTH 371. RESEARCH METHODS IN CULTURAL ANTHROPOLOGY. (4 Credits)
Designed for anthropology majors, this course involves students in learning about and practicing anthropological research methods. Students practice ethnographic fieldwork by conducting participant observation and interviews, writing fieldnotes, analyzing real-life material for cultural values and power differences, and writing up a research paper.
Prerequisites: ANTH 110 with D- or better

ANTH 372. *SOCIAL NETWORKS AND SOCIETY. (3 Credits)
Introduces the foundational theory and concepts of social network analysis (SNA) and explores practical applications of SNA in environmental science, public health, business, politics, education, and public life. Also explores how the Internet, social media, and other information and communication technologies are affecting social networks and culture in the 21st century. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ANTH 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ES 373, WGSS 373, WLC 373

ANTH 374. *ANTHROPOLOGY AND GLOBAL HEALTH. (3 Credits)
An overview of historical and contemporary issues in gender health with emphasis on politics, globalization, and the complex outcomes of interventions in diverse cultural settings. Students will articulate a critical and evidence-based perspective on complex global health issues. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Equivalent to: ANTH 374H

ANTH 374H. *ANTHROPOLOGY AND GLOBAL HEALTH. (3 Credits)
An overview of historical and contemporary issues in gender health with emphasis on politics, globalization, and the complex outcomes of interventions in diverse cultural settings. Students will articulate a critical and evidence-based perspective on complex global health issues. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: ANTH 374
ANTH 380. *CULTURES IN CONFLICT. (3 Credits)
Communication and commerce draw East and West, industrial and pre-industrial, state and stateless societies together. Beliefs and values clash and complement one another. Explores the processes of intercultural contact, cross-cultural interaction, and the consequences of global penetration of European-American culture. Evaluates theoretical explanations for cultural persistence and change. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Equivalent to: ANTH 380H
Recommended: ANTH 110 or completion of non-Western Cultures requirement

ANTH 380H. *CULTURES IN CONFLICT. (3 Credits)
Communication and commerce draw East and West, industrial and pre-industrial, state and stateless societies together. Beliefs and values clash and complement one another. Explores the processes of intercultural contact, cross-cultural interaction, and the consequences of global penetration of European-American culture. Evaluates theoretical explanations for cultural persistence and change. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: ANTH 380
Recommended: Completion of non-Western Cultures requirement

ANTH 383. *INTRODUCTION TO MEDICAL ANTHROPOLOGY. (3 Credits)
Examines human health and healing systems from evolutionary and cross-cultural perspectives. Using a case study approach, this class explores individual- and population-level experiences of illness and healing, while providing students with the tools to evaluate global disease patterns and international health promotion and education programs. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: ANTH 383H

ANTH 383H. *INTRODUCTION TO MEDICAL ANTHROPOLOGY. (3 Credits)
Examines human health and healing systems from evolutionary and cross-cultural perspectives. Using a case study approach, this class explores individual- and population-level experiences of illness and healing, while providing students with the tools to evaluate global disease patterns and international health promotion and education programs. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: ANTH 383

ANTH 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ANTH 399H
This course is repeatable for 16 credits.

ANTH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ANTH 399
This course is repeatable for 16 credits.

ANTH 401. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 402. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 403. THESIS. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 405. READING AND CONFERENCE. (1-6 Credits)
Equivalent to: ANTH 405H
This course is repeatable for 16 credits.

ANTH 405H. READING AND CONFERENCE. (1-6 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ANTH 405
This course is repeatable for 16 credits.

ANTH 406. PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 407. SEMINAR. (1-3 Credits)
Equivalent to: ANTH 407H
This course is repeatable for 16 credits.

ANTH 407H. SEMINAR. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ANTH 407
This course is repeatable for 16 credits.

ANTH 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 410. INTERNSHIP. (1-16 Credits)
Opportunities for students at junior and first-term senior class levels to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members.
This course is repeatable for 16 credits.
Recommended: 6 credits of anthropology.

ANTH 420. WORLD CULTURES--TOPICS. (4 Credits)
In-depth study of world cultures. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. Graded P/N.
Recommended: 9 credits of social science including 3 credits of anthropology

ANTH 421. ANALYSIS OF LITHIC TECHNOLOGIES. (4 Credits)
Covers the principles, procedures, and purpose of archaeological lithic analysis and the anthropological interpretation of lithic technologies used by prehistoric hunter-gatherers.
Prerequisites: ANTH 230 with D- or better

ANTH 422. HISTORIC MATERIALS ANALYSIS. (3 Credits)
Introduction to the analytical and descriptive methods and techniques used by historical archeologists to study late 18th through 20th century machine and handmade objects.
Prerequisites: ANTH 230 with D- or better

ANTH 423. METHOD AND THEORY IN HISTORICAL ARCHAEOLOGY. (4 Credits)
Examines the origins and growth of historical archaeology in the Americas. Students will critically learn about the linkages with history and anthropology and explore the theoretical underpinnings of historical archaeology.
ANTH 424. SETTLEMENT ARCHAEOLOGY. (4 Credits)
Explores the evolution of the theoretical underpinnings and field methods of settlement archaeology as well as the refinement of the meaning of ‘settlement archaeology’ over time.

ANTH 425. CERAMIC ANALYSIS IN ARCHAEOLOGY. (4 Credits)
Provides fundamental practical skills and theoretical perspectives for the analysis and interpretation of archaeological ceramics. On the practical side, students will learn both basic and advanced techniques for describing and analyzing pottery assemblages encountered by field archaeologists. On the theoretical side, the course will explore the diversity of research questions in which pottery can play a critical role, as well as the various ways in which ceramic data can be interpreted. Lec/lab.

Prerequisites: ANTH 230 with D- or better

ANTH 430. TOPICS IN ARCHAEOLOGY. (1-4 Credits)
Recent advances in archaeology and their application to special fields of study. Topics vary from term to term.

Prerequisites: ANTH 230 with D- or better or ANTH 330 with D- or better

This course is repeatable for 99 credits.

ANTH 432. *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION. (4 Credits)
Reviews the development of culture in the Old and New Worlds with special emphasis placed on the when, where, and how of early domestication of plants and animals. Examines the process of urbanization. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: ANTH 432H
Recommended: 6 credits of anthropology.

ANTH 432H. *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION. (4 Credits)
Reviews the development of culture in the Old and New Worlds with special emphasis placed on the when, where, and how of early domestication of plants and animals. Examines the process of urbanization. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ANTH 432
Recommended: 6 credits of anthropology

ANTH 433. FIRST AMERICANS, LAST FRONTIERS. (4 Credits)
The initial human occupation of the Western Hemisphere is explored with particular emphasis on northeast Siberian cultural progenitors, routes and timing of entry into the Americas, population dispersal theory, the paleoenvironmental record, and human cultural responses to the conditions of the last frontier prior to 8,000 years ago.

Attributes: LACN – Liberal Arts Non-Western Core
Recommended: 6 credits of anthropology

ANTH 434. NORTH AMERICA AFTER THE ICE AGE. (4 Credits)
The development of regional hunting and gathering adaptive strategies in North America from 8000 B.C. to the historic period are examined against a backdrop of changing climate, natural disasters, population growth, and human invention.

Recommended: ANTH 433 or 6 credits of anthropology.

ANTH 435. CULTURAL RESOURCES: POLICY AND PROCEDURES. (4 Credits)
Description and analysis of requirements and demands of cultural resource management. Historical development of cultural resource laws and appropriate field techniques and strategies to implement legislation.

Prerequisites: ANTH 230 with D- or better

ANTH 436. NORTHWEST PREHISTORY. (4 Credits)
Materials and theories relating to prehistoric aboriginal cultures of the Northwest. Evaluation of different theories on the origins and adaptations of prehistoric populations to ecological zones within the Northwest; comparisons of the cultural development through prehistoric times of the Columbia Plateau, intermontane and coastal zones of Oregon, Washington, and British Columbia. Special emphasis on the theories of origin, subsequent development of prehistoric cultures in the Northwest, and the present circumstances of archaeology in the Northwest.

Recommended: 6 credits of anthropology.

ANTH 437. GEOARCHAEOLOGY. (4 Credits)
Provides an introduction to geoarchaeological concepts and methods. Emphasis will be placed on the use of geoscientific perspectives and datasets to solve archaeological problems.

Prerequisites: ANTH 230 with D- or better

ANTH 438. ARCHAEOLOGY FIELD SCHOOL. (10-12 Credits)
Practical skills, archaeological methods and techniques including use of equipment, site surveying and mapping techniques, site excavation strategies, record keeping, field cataloging, report writing, and field camp management.

Recommended: 6 credits of anthropology

ANTH 439. ARCHAEOLOGY OF FORAGERS. (4 Credits)
Provides an in-depth review of the concepts and approaches employed to study cultural aspects of past foraging peoples using archaeological research methods and theoretical perspectives.

ANTH 440. TOPICS IN PHYSICAL ANTHROPOLOGY. (1-4 Credits)
Recent advances in physical anthropology and their applications to special fields of study. Topics vary from term to term.

Prerequisites: ANTH 240 with D- or better or ANTH 330 with D- or better

This course is repeatable for 16 credits.

Recommended: General biology

ANTH 441. HUMAN EVOLUTION. (4 Credits)
The evolutionary history of the primate order as it is represented by fossils of the Paleocene through the Holocene. Special attention given to development of the Hominoids in the Miocene, the Australopithecines in the Pliocene, and members of the genus Homo in the Pleistocene. Lec/lab.

Prerequisites: (ANTH 110 with D- or better or ANTH 210 with D- or better) and ANTH 240 [D-]

Recommended: General biology

ANTH 442. HUMAN ADAPTABILITY. (4 Credits)

Prerequisites: ANTH 240 with D- or better

Recommended: ANTH 340 or general biology

ANTH 443. HUMAN OSTEOLOGY LAB. (4 Credits)
Identification and analysis of human skeletal materials in an archaeological context.

Prerequisites: ANTH 240 with D- or better
ANTH 444. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, palaeodiagnostic assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Prerequisites: ANTH 240 with C or better or ANTH 330 with C or better
Equivalent to: FCSJ 444

ANTH 446. FORENSIC ANTHROPOLOGY. (4 Credits)
Concepts and practices in the use of anthropology in legal matters and police cases, especially involving identification of human remains.
Prerequisites: ANTH 443 with D- or better

ANTH 447. *ARCTIC PERSPECTIVES ON GLOBAL PROBLEMS. (4 Credits)
The Arctic is on the frontline of today’s most pressing global problems. This course uses Arctic perspectives to explore issues affecting us all: climate change, environmental conservation, traditional ecological knowledge, development, energy extraction, indigenous rights, and indigenous media. Using insights from Arctic perspectives, we will plot pathways toward potential solutions. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: ANTH 447H

ANTH 447H. *ARCTIC PERSPECTIVES ON GLOBAL PROBLEMS. (4 Credits)
The Arctic is on the frontline of today’s most pressing global problems. This course uses Arctic perspectives to explore issues affecting us all: climate change, environmental conservation, traditional ecological knowledge, development, energy extraction, indigenous rights, and indigenous media. Using insights from Arctic perspectives, we will plot pathways toward potential solutions. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: ANTH 447

ANTH 448. EVOLUTIONARY MEDICINE. (4 Credits)
Evolutionary medicine is founded on the idea that many challenges to human health can be accounted for by discords between contemporary environments and those under which humans evolved. This course examines ways anthropologists may help to reframe questions about diseases within long-term, evolutionary contexts.
Prerequisites: (ANTH 110 with D- or better or ANTH 210 with D- or better) and (ANTH 240 [D-] or ANTH 330 [D-])

ANTH 449. BIOCULTURAL PERSPECTIVES ON HUMAN REPRODUCTION. (4 Credits)
Examines human reproduction and sexuality from the perspective of the New Biocultural Synthesis, a theoretical approach in anthropology that examines the interface of evolved biological, sociocultural and political-economic factors that interact to produce complex human behaviors and biologies. Topics are presented from a life-history perspective where questions related to human reproduction and evolutionary history are examined across the lifespan from mating and conception through elderhood and menopause. Lec/lab.

ANTH 450. TOPICS IN LINGUISTIC ANTHROPOLOGY. (1-4 Credits)
Recent advances in the study of culture and communication and their application to special fields of knowledge. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 3 credits of linguistic anthropology.

ANTH 452. FOLKLORE AND EXPRESSIVE CULTURE. (4 Credits)
The study of folklore/popular culture in its social and historical context. Examines content, structure, communicative potential, and performative aspects of various forms of oral and written expression. Includes familiarization with the analysis of myths, legends, tall tales, proverbs, riddles, and play languages. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Recommended: 3 credits of social science.

ANTH 453. COMMUNITY HEALTH FIELD SCHOOL. (3-12 Credits)
Meets the growing need for international experiences for students in medical anthropology; international public health; and women, gender and sexuality studies. The field school is offered over a three- to seven-week period during the summer term. In-country time is flexible and can be adjusted depending on program requirements and financial constraints. Provides an intensive cross-cultural field experience in San Juan, Puerto Rico, that is premised on a model of community-engaged, service learning and applied, emancipatory research. This course is repeatable for 12 credits.

ANTH 455. REPRODUCTIVE JUSTICE: A SERVICE LEARNING COURSE. (4 Credits)
Reproductive Justice is a service-learning course that aims to bridge theory and practice in reproductive health and social justice by developing connections between the university campus and members of the local community.

ANTH 459. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ES 459, WLC 459

ANTH 460. ETHNOGRAPHIC FIELD SCHOOL. (6 Credits)
Involves an intensive field experience, learning and developing practical skills for operating socially and culturally in another culture. Students engage in anthropological and mixed research topics, methods, and analysis, such as research ethics, research design, participant observation, ethnographic interviewing, community mapping, qualitative and quantitative data analysis.

ANTH 461. NEUROANTHROPOLOGY. (4 Credits)
The emerging interdisciplinary field of neuroanthropology combines anthropological understandings of human biological and cultural variation with recent findings in neuroscience. Key topics include socialization and enculturation, addiction, ritual, depression, and psychiatric disorders.
Prerequisites: ANTH 240 with C- or better or ANTH 345 with C- or better or ANTH 383 with C- or better
ANTH 465. POPULAR CULTURE: AN ANTHROPOLOGICAL PERSPECTIVE. (4 Credits)
Introduces some of the debates and issues swirling around analyses of late twentieth-, early twenty-first century popular/mass/public/mediated/commercial culture. Learning about its pervasive forms, its origins and effects, how we are situated in it, and how it situates us is vital to understanding the changes that characterize our postmodern world.

ANTH 466. *RURAL ANTHROPOLOGY. (4 Credits)
Concentrates on study of the socio-cultural dynamics in rural communities as they develop in national and global contexts of political and economic change. Includes anthropological readings on rural issues in domestic and international contexts and a research paper on a contemporary rural issue. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: 3 credits of social science.

ANTH 468. ANTHROPOLOGY OF CHILDHOOD. (4 Credits)
Ethnographies of the organization of children’s lives in different cultural contexts are combined with readings on the conceptual and methodological genealogies that have constructed children as research subjects in anthropology.
Recommended: 3 credits of social science

ANTH 469. ENERGY IN CULTURAL PERSPECTIVE. (4 Credits)
Examines historical and current trends in energy around the globe. Course themes include the role of energy in economic development, cultural innovation in energy production, social problems that arise from energy shortages or the uneven distribution of energy resources and social and cultural changes required as societies attempt to reduce their dependence on fossil fuels.
Prerequisites: ANTH 110 with D- or better or ANTH 210 with D- or better

ANTH 470. TOPICS IN CULTURAL ANTHROPOLOGY. (1-16 Credits)
Covers recent advances in cultural anthropology and their applications to the field. Topics vary from term to term.
Equivalent to: ANTH 470H
This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 471. CASH, CLASS AND CULTURE: HUNTER-GATHERERS TO CAPITALISM. (4 Credits)
Students explore the cultural and social effects of capitalism in the contemporary world within the larger question of how economics and society intersect and change over time. Special emphases are put on food and work, but students explore the linkages of global forces and local life in a variety of ways.
Recommended: 3 credits of social science.

ANTH 472. CONTEMPORARY INDIAN ISSUES. (4 Credits)
Examines the background of Indian treaties and reservations with discussions of present issues such as health care, education, the Indian Child Welfare Act, fishing rights, and religious freedom. Issues are discussed in class with considerable class participation and some role playing.
Recommended: 3 credits of social science.

ANTH 473. *GENDER, ETHNICITY, AND CULTURE. (4 Credits)
Study of the practices and ideologies of gender as they intersect with those of ethnicity, race, class, and culture. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: 3 credits of social science.

ANTH 474. CROSS-CULTURAL HEALTH AND HEALING. (4 Credits)
A comprehensive overview of current issues in global health with particular emphasis on social, cultural, and behavioral interventions. Explores issues of health and development in the international context, focusing on such issues as inequality, structural adjustment, economic development, and community-based approaches to health care, specific cultural beliefs and practices, and the influence of people’s perceptions of health, illness, and healing.

ANTH 475. ANTHROPOLOGY IN PRACTICE. (4 Credits)
Capstone course for Anthropology majors. Discusses the use of anthropological skills and methods to solve real-world problems. Addresses professional opportunities for anthropologists; provides career development opportunities; and assesses learning outcomes for Anthropology majors.

ANTH 477. ECOLOGICAL ANTHROPOLOGY. (4 Credits)
Examines past and present interactions between humans and their environments. Emphasizes the concept of system and process of human adaptation.
Recommended: Upper-division standing and 3 credits of social science.

ANTH 478. *ANTHROPOLOGY OF TOURISM. (4 Credits)
Tourism is among the world’s largest industries. The anthropology of tourism seeks to understand the relationships between the industry and the other cultural productions. Students explore the cultural practices and impacts of tourism in relation to both host and guest communities, and travel as cultural practice. Course is taught online and on Corvallis campus. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: 3 credits of social science

ANTH 479. ANTHROPOLOGY OF MIGRATION. (4 Credits)
Focuses on the multiple aspects of population movements around the globe. Investigates the history of recent human migration; current theories, trends and policies; as well as issues of immigrant incorporation and anti-immigrant politics.
Recommended: 3 credits of social science.

ANTH 480. TOPICS IN APPLIED ANTHROPOLOGY. (1-4 Credits)
Recent advances in applied anthropology and their application to special fields of study. Topics vary from term to term.
This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 481. *NATURAL RESOURCES AND COMMUNITY VALUES. (3 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: 3 credits of social science.

ANTH 481H. *NATURAL RESOURCES AND COMMUNITY VALUES. (3 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Recommended: 3 credits of social science.
ANTH 482. *ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT. (4 Credits)
Examines the ideological and theoretical bases of world assistance programs and their effects on different sectors and classes, including women. Causes of world hunger in terms of agronomic, mainstream economic and radical economic paradigms are developed and contrasted. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: AG 482

ANTH 483. ADVANCED MEDICAL ANTHROPOLOGY. (4 Credits)
An overview of anthropological studies of the health of human communities from a biological and behavioral perspective. Topics include prehistory of disease, cultural perspectives on causation of disease and approaches to healing; anthropological approach to international health issues; and case studies.
Prerequisites: (ANTH 110 with D- or better or ANTH 210 with D- or better) and (ANTH 240 [D-] or ANTH 330 [D-])

ANTH 484. *WEALTH AND POVERTY. (4 Credits)
Summarizes the distribution of wealth observed cross-culturally and through time. Determines the relation between wealth distribution and economic productivity. Shows the impact of industrialization and economic wealth distribution in Western civilization and cross-culturally. Evaluates how cultural practices affect wealth distribution in Western and non-Western societies. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: 3 credits of social science

ANTH 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D-] or ES 410 [D-] or WGSS 410 [D-] or WLC 410 [D-])
Equivalent to: ES 485, WGSS 485, WLC 485
This course is repeatable for 4 credits.

ANTH 486. ANTHROPOLGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Attributes: LACS – Liberal Arts Social Core
Equivalent to: FCSJ 486
Recommended: 3 credits of social science.

ANTH 487. LANGUAGE IN GLOBAL CONTEXT. (4 Credits)
Deals with practical uses of linguistics in the global political arena. Explores use of official vs. unofficial languages, language standardization, the preservation of dying languages; problems in learning first and second languages, and the relevance of linguistic knowledge to education and cross-cultural communication.
Prerequisites: ANTH 251 with D- or better or ANTH 350 with D- or better
Recommended: Some knowledge of linguistic structure

ANTH 490. TOPICS IN METHODOLOGY. (1-4 Credits)
Recent advances in anthropological methodologies and their application to special fields of study. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 6 credits of anthropology

ANTH 492. ARCHAEOLOGICAL LABORATORY METHODS. (1-3 Credits)
Provides information on the basics of archaeological laboratory work. Students learn the day-to-day operations of a lab, how to classify and catalog artifacts, and how to do artifact analysis, research hypothesis. Recommended: 6 credits of anthropology

ANTH 497. ARCHAEOLOGICAL FIELD METHODS. (1-3 Credits)
Archaeological field strategies emphasizing reconnaissance and survey. Application of field equipment and project management.

ANTH 498. ORAL NARRATIVE. (3 Credits)
Methodology course focused on the collection and processing of multiple speech genres, including personal narrative, oral history, folklore, and songs. Attention is given to ethics, legal issues, different forms of transcription, and the politics of representation.
Prerequisites: ANTH 350 with D- or better

ANTH 499. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
Equivalent to: ANTH 499H
This course is repeatable for 16 credits.

ANTH 499H. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ANTH 499
This course is repeatable for 16 credits.

ANTH 501. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 999 credits.

ANTH 503. THESIS. (1-12 Credits)
This course is repeatable for 16 credits.

ANTH 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 506. PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 507. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.

ANTH 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 510. GRADUATE INTERNSHIP. (1-16 Credits)
Opportunities for students at junior and first-term senior class levels to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members. This course is repeatable for 16 credits. Recommended: 6 credits of anthropology.

ANTH 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student's research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSLISTED as ANTH 515/ CSSA 515/ES 515/WGSS 515.
Equivalent to: CSSA 515, ES 515, WGSS 515
ANTH 519. BIOLOGIES OF POVERTY. (4 Credits)  
A readings-based, discussion seminar on the applications of biological and biocultural anthropological theory to questions of embodiment and poverty. In it we will explore the ways key theoretical and methodological developments over the past two decades enable biocultural anthropologists to measure and explain the ways poverty and inequality become embedded beneath our skin—that is, the ways culture, belief, difference, power and discrimination are written on our bodies, and thus contribute to inequities in health outcomes across populations.  
Recommended: A minimum of 6 credits of anthropology coursework

ANTH 521. ANALYSIS OF LITHIC TECHNOLOGIES. (4 Credits)  
Covers the principles, procedures, and purpose of archaeological lithic analysis and the anthropological interpretation of lithic technologies used by prehistoric hunter-gatherers.  
Recommended: ANTH 230

ANTH 522. HISTORIC MATERIALS ANALYSIS. (3 Credits)  
Introduction to the analytical and descriptive methods and techniques used by historical archeologists to study late 18th through 20th century machine and handmade objects.  
Recommended: ANTH 230

ANTH 523. METHOD AND THEORY IN HISTORICAL ARCHAEOLOGY. (4 Credits)  
Examines the origins and growth of historical archaeology in the Americas. Students will critically learn about the linkages with history and anthropology and explore the theoretical underpinnings of historical archaeology.

ANTH 524. SETTLEMENT ARCHAEOLOGY. (4 Credits)  
Explores the evolution of the theoretical underpinnings and field methods of settlement archaeology as well as the refinement of the meaning of 'settlement archaeology' over time.

ANTH 525. CERAMIC ANALYSIS IN ARCHAEOLOGY. (4 Credits)  
Provides fundamental practical skills and theoretical perspectives for the analysis and interpretation of archaeological ceramics. On the practical side, students will learn both basic and advanced techniques for describing and analyzing pottery assemblages encountered by field archaeologists. On the theoretical side, the course will explore the diversity of research questions in which pottery can play a critical role, as well as the various ways in which ceramic data can be interpreted. Lec/lab.

Recommended: ANTH 230

ANTH 530. TOPICS IN ARCHAEOLOGY. (1-4 Credits)  
Recent advances in archaeology and their application to special fields of study. Topics vary from term to term.  
This course is repeatable for 16 credits.  
Recommended: ANTH 230 or ANTH 330

ANTH 531. ARCHAEOLOGICAL THEORY. (4 Credits)  
Historical development of archaeological field techniques and theoretical concepts with an emphasis on modern method and theory in North American archaeology.

Recommended: ANTH 230

ANTH 533. FIRST AMERICANS, LAST FRONTIERS. (4 Credits)  
The initial human occupation of the Western Hemisphere is explored with particular emphasis on northeast Siberian cultural progenitors, routes and timing of entry into the Americas, population dispersal theory, the paleoenvironmental record, and human cultural responses to the conditions of the last frontier prior to 8,000 years ago.

Recommended: 6 credits of anthropology.

ANTH 534. NORTH AMERICA AFTER THE ICE AGE. (4 Credits)  
The development of regional hunting and gathering adaptive strategies in North America from 8000 B.C. to the historic period are examined against a backdrop of changing climate, natural disasters, population growth, and human invention.  
Recommended: ANTH 433 or 6 credits of anthropology

ANTH 535. CULTURAL RESOURCES: POLICY AND PROCEDURES. (4 Credits)  
Description and analysis of requirements and demands of cultural resource management. Historical development of cultural resource laws and appropriate field techniques and strategies to implement legislation.  
Recommended: ANTH 431

ANTH 536. NORTHWEST PREHISTORY. (4 Credits)  
Materials and theories relating to prehistoric aboriginal cultures of the Northwest. Evaluation of different theories on the origins and adaptations of prehistoric populations to ecological zones within the Northwest; comparisons of the cultural development through prehistoric times of the Columbia Plateau, intermontane and coastal zones of Oregon, Washington, and British Columbia. Special emphasis on the theories of origin, subsequent development of prehistoric cultures in the Northwest, and the present circumstances of archaeology in the Northwest.  
Recommended: 6 credits of anthropology

ANTH 537. GEOARCHAEOLOGY. (4 Credits)  
Provides an introduction to geoarchaeological concepts and methods. Emphasis will be placed on the use of geoscientific perspectives and datasets to solve archaeological problems.  
Recommended: ANTH 230

ANTH 538. ARCHAEOLOGY FIELD SCHOOL. (1-10 Credits)  
Practical skills, archaeological methods and techniques including use of equipment, site surveying and mapping techniques, site excavation strategies, record keeping, field cataloging, report writing, and field camp management.  
Recommended: 6 credits of anthropology

ANTH 539. ARCHAEOLOGY OF FORAGERS. (4 Credits)  
Provides an in-depth review of the concepts and approaches employed to study cultural aspects of past foraging peoples using archaeological research methods and theoretical perspectives.

ANTH 540. TOPICS IN PHYSICAL ANTHROPOLOGY. (1-4 Credits)  
Recent advances in physical anthropology and their applications to special fields of study. Topics vary from term to term.  
This course is repeatable for 16 credits.  
Recommended: ANTH 240 or ANTH 330 or general biology

ANTH 541. HUMAN EVOLUTION. (4 Credits)  
The evolutionary history of the primate order as it is represented by fossils of the Paleocene through the Holocene. Special attention given to development of the Hominoids in the Miocene, the Australopithecines in the Pliocene, and members of the genus Homo in the Pleistocene. Lec/lab.

Recommended: (ANTH 110 or ANTH 210) and ANTH 240

ANTH 542. HUMAN ADAPTABILITY. (4 Credits)  
Overview of human biology and its various sub fields, applications of human biology in areas of nutrition, health, growth, adaptation, and demography. Understanding adaptive variations among populations and individuals in responses to environment, disease, and nutritional stress.

Recommended: ANTH 240 or ANTH 340 or general biology
ANTH 543. HUMAN OSTEOLOGY LAB. (4 Credits)
Identification and analysis of human skeletal materials in an archaeological context.
Recommended: ANTH 240

ANTH 544. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, paleodietary assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Equivalent to: FCSJ 544
Recommended: ANTH 240 or ANTH 330

ANTH 546. FORENSIC ANTHROPOLOGY. (4 Credits)
Concepts and practices in the use of anthropology in legal matters and police cases, especially involving identification of human remains.
Recommended: ANTH 443

ANTH 547. METHODS IN FOOD IN CULTURE AND SOCIAL JUSTICE STUDIES. (4 Credits)
Exposes graduate students to the methodological approaches and methods used in guiding empirical research on the socio-cultural aspects of food, focusing on vulnerable populations, food security, procurement, foodways, disasters, and climate change. Methodological approaches and methods as evidenced in peer-reviewed publications is the grounding for the course. CROSSLISTED as ANTH 547/FCSJ 547.
Equivalent to: FCSJ 547

ANTH 548. EVOLUTIONARY MEDICINE. (4 Credits)
Evolutionary medicine is founded on the idea that many challenges to human health can be accounted for by discordances between contemporary environments and those under which humans evolved. This course examines ways anthropologists may help to reframe questions about diseases within long-term, evolutionary contexts.
Recommended: (ANTH 110 or ANTH 210) and (ANTH 240 or ANTH 330)

ANTH 549. BIOCULTURAL PERSPECTIVES ON HUMAN REPRODUCTION. (4 Credits)
Examines human reproduction and sexuality from the perspective of the New Biocultural Synthesis, a theoretical approach in anthropology that examines the interface of evolved biological, sociocultural and political-economic factors that interact to produce complex human behaviors and biologies. Topics are presented from a life-history perspective where questions related to human reproduction and evolutionary history are examined across the lifespan from mating and conception through elderhood and menopause. Lec/lab.

ANTH 550. TOPICS IN LINGUISTIC ANTHROPOLOGY. (1-4 Credits)
Recent advances in the study of culture and communication and their application to special fields of knowledge. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 3 credits of linguistic anthropology.

ANTH 551. LINGUISTIC ANTHROPOLOGY. (4 Credits)
The study of language in social context including the relationships between language and age, gender, personality, religion, ethnicity and social class. Examines pidgins, creoles, dialects, genres and the processes of language change.
Recommended: ANTH 251 or ANTH 350

ANTH 552. FOLKLORE AND EXPRESSIVE CULTURE. (4 Credits)
The study of folklore/popular culture in its social and historical context. Examines content, structure, communicative potential, and performative aspects of various forms of oral and written expression. Includes familiarization with the analysis of myths, legends, tall tales, proverbs, riddles, and play languages.
Recommended: ANTH 251 or ANTH 350

ANTH 553. COMMUNITY HEALTH FIELD SCHOOL. (3-12 Credits)
Meets the growing need for international experiences for students in medical anthropology; international public health; and women, gender and sexuality studies. The field school is offered over a three- to seven-week period during the summer term. In-country time is flexible and can be adjusted depending on program requirements and financial constraints. Provides an intensive cross-cultural field experience in San Juan, Puerto Rico, that is premised on a model of community-engaged, service learning and applied, emancipatory research. This course is repeatable for 12 credits.

ANTH 555. REPRODUCTIVE JUSTICE: A SERVICE LEARNING COURSE. (4 Credits)
Reproductive Justice is a service-learning course that aims to bridge theory and practice in reproductive health and social justice by developing connections between the university campus and members of the local community.

ANTH 556. SOCIAL NETWORK ANALYSIS: METHODS AND THEORY. (4 Credits)
An introduction to social network analysis (SNA), focusing on the methods of research design, data collection, and analysis. Students will learn key concepts and theories of SNA, apply these concepts to research projects in their chosen field, develop methods for collecting network data, and perform qualitative and quantitative analysis of these networks. Readings draw on studies of social networks from a variety of disciplines, including anthropology, sociology, environmental studies, public health, and political science.

ANTH 559. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas— as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ES 559, WLC 559

ANTH 560. ETHNOGRAPHIC FIELD SCHOOL. (6 Credits)
Involves an intensive field experience, learning and developing practical skills for operating socially and culturally in another culture. Students engage in anthropological and mixed research topics, methods, and analysis, such as research ethics, research design, participant observation, ethnographic interviewing, community mapping, qualitative and quantitative data analysis.

ANTH 561. NEUROANTHROPOLOGY. (4 Credits)
The emerging interdisciplinary field of neuroanthropology combines anthropological understandings of human biological and cultural variation with recent findings in neuroscience. Key topics include socialization and enculturation, addiction, ritual, depression, and psychiatric disorders.
Recommended: ANTH 240 or ANTH 345 or ANTH 383
ANTH 565. POPULAR CULTURE: AN ANTHROPOLOGICAL PERSPECTIVE. (4 Credits)
Introduces some of the debates and issues swirling around analyses of late twentieth-, early twenty-first century popular/mass/public/mediated/commercial culture. Learning about its pervasive forms, its origins and effects, how we are situated in it, and how it situates us is vital to understanding the changes that characterize our postmodern world.

ANTH 566. RURAL ANTHROPOLOGY. (4 Credits)
Concentrates on study of socio-cultural dynamics in rural communities as they develop in national and global contexts of political and economic change. Includes anthropological readings on rural issues in domestic and international contexts and a research paper on a contemporary rural issue.
Recommended: 3 credits of social science.

ANTH 567. AGRI-FOOD MOVEMENTS. (4 Credits)
Investigates the origins and contemporary status of producer and consumer food movements including, but not limited to, organics, agricultural labor movements, animal welfare, vegetarian and vegan movements, farmers’ markets, and permaculture. CROSSLISTED as ANTH 567/FCSJ 567.
Equivalent to: FCSJ 567

ANTH 568. ANTHROPOLOGY OF CHILDHOOD. (4 Credits)
Ethnographies of the organization of children’s lives in different cultural contexts are combined with readings on the conceptual and methodological genealogies that have constructed children as research subjects in anthropology.
Recommended: 3 credits of social science

ANTH 569. ENERGY IN CULTURAL PERSPECTIVE. (4 Credits)
Examines historical and current trends in energy around the globe. Course themes include the role of energy in economic development, cultural innovation in energy production, social problems that arise from energy shortages or the uneven distribution of energy resources and social and cultural changes required as societies attempt to reduce their dependence on fossil fuels.
Recommended: ANTH 110 or ANTH 210

ANTH 570. TOPICS IN CULTURAL ANTHROPOLOGY. (1-16 Credits)
Covers recent advances in cultural anthropology and their applications to the field. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 571. CASH, CLASS AND CULTURE: HUNTER-GATHERERS TO CAPITALISM. (4 Credits)
Students explore the cultural and social effects of capitalism in the contemporary world within the larger question of how economics and society intersect and change over time. Special emphases are put on food and work, but students explore the linkages of global forces and local life in a variety of ways.
Recommended: 3 credits of social science.

ANTH 572. CONTEMPORARY INDIAN ISSUES. (4 Credits)
Examines the background of Indian treaties and reservations with discussions of present issues such as health care, education, the Indian Child Welfare Act, fishing rights, and religious freedom. Issues are discussed in class with considerable class participation and some role playing.
Recommended: 3 credits of social science.

ANTH 573. GENDER, ETHNICITY, AND CULTURE. (4 Credits)
Study of the practices and ideologies of gender as they intersect with those of ethnicity, race, class, and culture.
Recommended: 3 credits of social science.

ANTH 574. CROSS-CULTURAL HEALTH AND HEALING. (4 Credits)
A comprehensive overview of current issues in global health with particular emphasis on social, cultural, and behavioral interventions. Explores issues of health and development in the international context, focusing on such issues as inequality, structural adjustment, economic development, and community-based approaches to health care, specific cultural beliefs and practices, and the influences of people’s perceptions of health, illness, and healing.

ANTH 575. THEORY OF CULTURE. (4 Credits)
Core ideas in the discipline of anthropology. Examination of the contributions to anthropological method and theory of the major schools of thought in the history of anthropology.
Recommended: 9 credits of upper-division social science, including at least one 400-level anthropology course.

ANTH 576. ADVANCED ANTHROPOLOGICAL THEORY SEMINAR. (4 Credits)
Investigates theories used by current anthropologists to explicate issues of concern in a world of movement, fragmentation, global-local interactions, individuation via state and media unequal power relations, and neoliberal agendas. Students will participate in discussions, essays and a paper that links these theories to their research topics for theses or dissertations.
Recommended: ANTH 575

ANTH 577. ECOLOGICAL ANTHROPOLOGY. (4 Credits)
Examines past and present interactions between humans and their environments. Emphasizes the concept of system and process of human adaptation.
Recommended: 3 credits of social science

ANTH 578. ANTHROPOLOGY OF TOURISM. (4 Credits)
Examines the cultural practices and impacts of tourism in relation to both host and guest communities, and travel itself as a part of culture. We will explore theories of tourism and what role anthropology can play in influencing the industry and tourist and host relationships.
Recommended: 3 credits of social science.

ANTH 579. ANTHROPOLOGY OF MIGRATION. (4 Credits)
Focuses on the multiple aspects of population movements around the globe. Investigates the history of recent human migration; current theories, trends and policies; as well as issues of immigrant incorporation and anti-immigrant politics.
Recommended: 3 credits of social science.

ANTH 580. TOPICS IN APPLIED ANTHROPOLOGY. (1-4 Credits)
Recent advances in applied anthropology and their application to special fields of study. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 581. NATURAL RESOURCES AND COMMUNITY VALUES. (4 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology.
Recommended: 3 credits of social science.
ANTH 582. ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT. (4 Credits)
Examines the ideological and theoretical bases of world assistance programs and their effects on different sectors and classes, including women. Causes of world hunger in terms of agronomic, mainstream economic and radical economic paradigms are developed and contrasted.
Equivalent to: AG 582

ANTH 583. ADVANCED MEDICAL ANTHROPOLOGY. (4 Credits)
An overview of anthropological studies of the health of human communities from a biological and behavioral perspective. Topics include prehistory of disease, cultural perspectives on causation of disease and approaches to healing; anthropological approach to international health issues; and case studies.
Recommended: (ANTH 110 or ANTH 210) and (ANTH 240 or ANTH 330)

ANTH 584. WEALTH AND POVERTY. (4 Credits)
Summarizes the distribution of wealth observed cross-culturally and through time. Determines the relation between wealth distribution and economic productivity. Shows the impact of industrialization and economic wealth distribution in Western civilization and cross-culturally. Evaluates how cultural practices affect wealth distribution in Western and non-Western societies.
Recommended: 3 credits of social science.

ANTH 585. USES OF ANTHROPOLOGY. (4 Credits)
Examines the practical applications of anthropological knowledge in historical and contemporary contexts. Focuses on planned social change and roles of anthropologists in interdisciplinary research and nonacademic settings such as international business, industrial relations, economic and technological development, education, legal institutions, environmental change, minority relations, health care, and cultural preservation. Emphasizes relevance to public policy and ethical issues associated with applications of anthropological knowledge.
Recommended: 3 credits of social science.

ANTH 586. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Equivalent to: FCSJ 586
Recommended: 3 credits of social science.

ANTH 587. LANGUAGE IN GLOBAL CONTEXT. (4 Credits)
Deals with practical uses of linguistics in the global political arena. Explores use of official vs. unofficial languages, language standardization, the preservation of dying languages; problems in learning first and second languages, and the relevance of linguistic knowledge to education and cross-cultural communication.
Recommended: ANTH 251 or ANTH 350 or some knowledge of linguistic structure

ANTH 590. TOPICS IN METHODOLOGY. (1-4 Credits)
Recent advances in anthropological methodologies and their application to special fields of study. Topics vary from term to term.
This course is repeatable for 16 credits.
Recommended: 6 credits anthropology

ANTH 591. ETHNOGRAPHIC METHODS. (4 Credits)
Cultural descriptions are produced through systematic observation, elicitation, and analysis to achieve proximity to the insider's point of view. Covers techniques of interviewing, validating, and interpreting cultural data. Allows students to practice what they have learned.
Recommended: 6 credits of anthropology

ANTH 592. ARCHAEOLOGICAL LABORATORY METHODS. (1-3 Credits)
Provides information on the basics of archaeological laboratory work. Students learn the day-to-day operations of a lab, how to classify and catalog artifacts, and how to do artifact analysis.
Recommended: 6 credits of anthropology

ANTH 593. STATISTICAL APPLICATIONS IN ANTHROPOLOGY. (4 Credits)
Develops the skills necessary to use statistical software to analyze and interpret numerical data. Covers descriptive statistics, correlation, and multivariate statistical procedures. Evaluate the adequacy of data for parametric and nonparametric statistical tests.
Recommended: A minimum of 6 credits of anthropology if an undergraduate

ANTH 595. ANTHROPOLOGICAL RESEARCH DESIGN. (4 Credits)
Critical examination of research design and methodology in anthropology; analysis of methods and procedures of research in the subfields of anthropology.
Recommended: 9 credits of upper-division social science, including at least one 400-level anthropology course.

ANTH 597. ARCHAEOLOGICAL FIELD METHODS. (1-3 Credits)
Archaeological field strategies emphasizing reconnaissance and survey. Application of field equipment and project management.

ANTH 598. ORAL TRADITIONS. (3 Credits)
Method of examining unwritten culture preserved in speech, including local history, folklore, and songs passed from one generation to another. May include the use of life history, genealogy, and other means of collecting information. Attention is given to ethics, legal issues, and the process of transcription.
Recommended: ANTH 350

ANTH 599. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 602. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ANTH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
ANTH 695. ANTHROPOLOGICAL RESEARCH DESIGN. (4 Credits)
Doctoral student seminar focused on the research process, from the selection of a research topic, to the choice of appropriate methods for data collection and analysis, to the submission of a research proposal. Class assignments will result in completion of a research proposal. Seminal discussion will focus on problem formulation, statement of objectives, theoretical background, methodological approach, analytical techniques, ethical responsibilities, justification for the research, data analysis and interpretation, and budgetary concerns.

ANTH 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 808. WORKSHOPS. (1-16 Credits)
This course is repeatable for 16 credits.

Arabic Language

ARAB 111. FIRST-YEAR ARABIC. (4 Credits)
Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Initiation to Arabic culture and attitudes. Designed for students with no prior training in Arabic. Native and/or bilingual speakers of Arabic will not receive credit for ARAB 111, ARAB 112, ARAB 113.
Equivalent to: ARAB 111H

ARAB 199. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

ARAB 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ARAB 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ARAB 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

American Sign Language

ASL 111. FIRST-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A beginning course to learn the basics of American Sign Language. The course focuses on the ASL language and its uses of syntax, grammar, vocabulary, facial expressions and deaf culture.

ASL 112. FIRST-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of ASL 111 with the development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 111, ASL 112, ASL 113.
Prerequisites: ASL 111 with D- or better
Recommended: Basic foundation of the language

ASL 113. FIRST-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of ASL 111 and ASL 112 with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 111, ASL 112, ASL 113.
Prerequisites: ASL 112 with D- or better

ASL 211. SECOND-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of the first-year ASL courses with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 211, ASL 212, ASL 213.
Prerequisites: ASL 113 with D- or better

ASL 212. SECOND-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of the second-year ASL series with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 211, ASL 212, ASL 213.
Prerequisites: ASL 211 with D- or better

ASL 213. SECOND-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of the second-year ASL series with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 211, ASL 212, ASL 213.
Prerequisites: ASL 212 with D- or better

Asian Languages and Cultures

ASN 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Chinese Language

CHN 111. FIRST-YEAR CHINESE. (4 Credits)
Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111, CHN 112, CHN 113.
Equivalent to: CHN 111H

CHN 112. FIRST-YEAR CHINESE. (4 Credits)
Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111, CHN 112, CHN 113.
Prerequisites: CHN 111 with D- or better

CHN 113. FIRST-YEAR CHINESE. (4 Credits)
Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111, CHN 112, CHN 113.
Prerequisites: CHN 112 with D- or better

CHN 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

CHN 211. SECOND-YEAR CHINESE. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211, CHN 212, CHN 213. Completion of CHN 213 with grade of C- or better satisfies BA requirement in foreign languages. Lec/Rec.
Prerequisites: CHN 113 with C- or better

CHN 212. SECOND-YEAR CHINESE. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211, CHN 212, CHN 213. Completion of CHN 213 with grade of C- or better satisfies BA requirement in foreign languages. Lec/discussion/activity.
Prerequisites: CHN 211 with D- or better
CHN 213. SECOND-YEAR CHINESE. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211, CHN 212, CHN 213. Completion of CHN 213 with grade of C- or better satisfies BA requirement in foreign languages. Lec/discussion.
Prerequisites: CHN 212 with C- or better

CHN 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 6 credits.

CHN 311. THIRD-YEAR CHINESE LANGUAGE. (3 Credits)
Further development of listening, speaking, reading, and writing skills to a more advanced level with emphasis on the practical application of the Chinese language.
Prerequisites: CHN 213 with C- or better

CHN 312. THIRD-YEAR CHINESE LANGUAGE. (3 Credits)
Further development of listening, speaking, reading, and writing skills to a more advanced level with emphasis on the practical application of the Chinese language. Lec/rec.
Prerequisites: CHN 311 with C- or better

CHN 313. THIRD-YEAR CHINESE LANGUAGE. (3 Credits)
Further development of listening, speaking, reading, and writing skills to a more advanced level with emphasis on the practical application of the Chinese language.
Prerequisites: CHN 312 with C- or better

CHN 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students, with assignments as proctor or tutor in lower-division Chinese courses. May be repeated for credit. No credit may be used to satisfy requirements for a minor in Chinese. Graded P/N.
This course is repeatable for 6 credits.
Recommended: Completion of third-year Chinese with a minimum 3.0 GPA in that sequence

CHN 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

CHN 411. FOURTH-YEAR CHINESE (NEWSPAPER CHINESE). (3 Credits)
Development of reading, writing, and speaking skills at a more advanced level; reading of newspaper articles from China, Taiwan, and other sources; oral reports and compositions in Chinese. Not offered every year.
Recommended: CHN 313

CHN 412. FOURTH-YEAR CHINESE (NEWSPAPER CHINESE). (3 Credits)
Development of reading, writing, and speaking skills at a more advanced level; reading of newspaper articles from China, Taiwan, and other sources; oral reports and compositions in Chinese. Not offered every year.
Recommended: CHN 411

CHN 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 505. READING AND CONFERENCE. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 16 credits.

College Student Services Administration

CSSA 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AHE 501, ED 501
This course is repeatable for 16 credits.

CSSA 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 502
This course is repeatable for 16 credits.

CSSA 503. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 503
This course is repeatable for 999 credits.

CSSA 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 505
This course is repeatable for 16 credits.

CSSA 506. PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 506
This course is repeatable for 16 credits.

CSSA 507. SEMINAR. (1-5 Credits)
Graded P/N.
Equivalent to: AHE 507
This course is repeatable for 16 credits.

CSSA 508. WORKSHOP. (1-3 Credits)
Graded P/N.
Equivalent to: AHE 508
This course is repeatable for 16 credits.

CSSA 510. INTERNSHIP. (1-18 Credits)
Graded P/N.
Equivalent to: ED 510
This course is repeatable for 18 credits.

CSSA 513. RESEARCH IN HIGHER EDUCATION. (3 Credits)
Basic understanding of research and assessment ideas, uses, and practices in higher education and student affairs.
Equivalent to: AHE 513

CSSA 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student's research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSLISTED as ANTH 515/ CSSA 515/ES 515/WGSS 515.
Equivalent to: ANTH 515, ES 515, WGSS 515
CSSA 520. MULTICULTURAL ISSUES IN HIGHER EDUCATION. (3 Credits)
Developing understanding, knowledge, and skills of multiculturalism affecting the student affairs profession and careers in student affairs administration.
Equivalent to: AHE 520

CNSA 530. FUNDAMENTALS OF COUNSELING. (3 Credits)
Explores basic helping skills and processes appropriate in a variety of settings, specifically within the higher education arena. Instruction will focus on a variety of counseling skills and techniques through videotape and role plays. Course activities will explore ethical standards of conduct, multicultural considerations and competencies, and engage in discussions of counseling issues within higher education.
Equivalent to: COUN 530

CNSA 535. TRAGEDY AND CRISIS MANAGEMENT IN HIGHER EDUCATION. (3 Credits)
Introduction to the history of major incidents of college and university tragedies and best practices for preventing and responding to these crisis situations.

CNSA 548. AMERICAN HIGHER EDUCATION. (3 Credits)
The origins and development of higher education in the United States from the colonial colleges to the present.
Equivalent to: AHE 548

CNSA 549. GLOBALIZATION IN HIGHER EDUCATION. (3 Credits)
Exposes students to the multifaceted nature of global education by exploring Globalization/internationalization as it relates not only to student affairs, but to the greater higher education setting.

CNSA 551. PROGRAMS AND FUNCTIONS IN COLLEGE STUDENT SERVICES. (3 Credits)
Historical, philosophical, and organizational foundations; operational components and functional areas; overview and analysis of college student services in postsecondary educational institutions; leadership development.
Equivalent to: AHE 551

CNSA 552. STUDENT DEVELOPMENT IN UNIVERSITIES AND COLLEGES. (3 Credits)
Theoretical and philosophical foundations of student development; analysis of college student characteristics and the student culture; nontraditional student subgroups; student attitudes, values, and beliefs; concepts and models that promote student learning; and assessment of student growth.
Equivalent to: AHE 552
This course is repeatable for 6 credits.

CNSA 553. STUDENT DEVELOPMENT IN UNIVERSITIES AND COLLEGES II. (3 Credits)
Gain a deeper understanding of adult student populations and development theory (specifically, cognitive theories and typologies) and its application to practice.

CNSA 554. LEGAL ISSUES IN HIGHER EDUCATION. (3 Credits)
A comprehensive presentation and discussion of the law governing administration within public colleges and universities with a special emphasis on tort liability and freedom of expression.
Equivalent to: AHE 554

CNSA 557. PROFESSIONAL DEVELOPMENT IN COLLEGE STUDENT SERVICES. (1 Credit)
Self-assessment, goal setting, professional growth, and professional ethics as a practitioner in college student services administration. Graded P/N.
Equivalent to: AHE 557

CNSA 558. ORGANIZATION AND ADMINISTRATION OF COLLEGE STUDENT SERVICES. (3 Credits)
Legal foundations, governance models, planning, and goal setting, resource acquisition and allocation, personnel and financial management and administrative leadership.
Equivalent to: AHE 558

CNSA 559. CSSA TRANSITIONS. (3 Credits)
First-term CSSA students will explore issues of professional transition, orientation and acculturation, including: foundational professional values that inform student affairs work; student affairs professional associations; student affairs research and scholarship; social justice in higher education; and approaches to self-care and professional well-being.

CNSA 574. BUDGET AND FINANCE. (2 Credits)
Introduction to budget and finance in student services. Overview of topics with which student affairs practitioners should be familiar, able to use, and to assess.
Equivalent to: AHE 574

CNSA 599. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AHE 599, ED 599
This course is repeatable for 16 credits.

Ethnic Studies

ES 101. *INTRODUCTION TO ETHNIC STUDIES. (3 Credits)
This interdisciplinary course focuses on the ethnic group experience in the United States with emphasis on African Americans, Native Americans, Chicanos/as, Latinos/as, and Asian Americans. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACS – Liberal Arts Social Core

ES 159. *LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed notions. CROSSLISTED as ANTH 159/ES 159/WLC 159. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ANTH 159, WLC 159

ES 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 201. *INVENTING ETHNIC AMERICA. (3 Credits)
An examination of past and present constructions of race and ethnicity in U.S. culture and society and their impact on individuals, institutions, policies, and practices, with particular emphasis on contemporary America. (Bacc Core Course) (H) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core

ES 211. *INTRODUCTION TO LATINO/A STUDIES. (4 Credits)
An introduction to key concepts and ideas in Latino/a Studies, with a focus on the processes that led to the historical incorporation of various Latin@ groups into the United States, and the factors that have shaped contexts of reception for Latino/as historically. Students will explore connections and disconnections between historical and present day discourses and processes. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
ES 213. *LATINO/A IDENTITIES AND ACTIVISM. (4 Credits)
A comparative interdisciplinary treatment of contemporary Latino/a cultures and current issues affecting their status in the United States. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

ES 221. *SURVEY OF AFRICAN AMERICAN STUDIES I. (4 Credits)
An interdisciplinary survey of the African American experience beginning with pre-colonial Africa to the early 1900s. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 221

ES 221H. *SURVEY OF AFRICAN AMERICAN STUDIES I. (3 Credits)
An interdisciplinary survey of the African American experience beginning with pre-colonial Africa and ending with World War I. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 221

ES 223. *SURVEY OF AFRICAN AMERICAN STUDIES II. (4 Credits)
An interdisciplinary survey of the African American experience from World War I to the present. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: ES 223

ES 223H. *SURVEY OF AFRICAN AMERICAN STUDIES II. (4 Credits)
An interdisciplinary survey of the African American experience from World War I to the present. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ES 223

ES 231. *INTRODUCTION TO ASIAN AMERICAN STUDIES. (4 Credits)
An examination of the histories and experiences of Asian Americans from the mid-1800s to the present through historical texts, oral histories, personal essays, video, audio, and creative writings. (H) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core

ES 233. *ASIAN PACIFIC AMERICAN ACTIVISM AND EMPOWERMENT. (4 Credits)
A look at Asian Pacific American activism and issues, from early labor organizing to contemporary community efforts, with particular emphasis on the 1960s to the present. (H) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core

ES 241. *INTRODUCTION TO NATIVE AMERICAN STUDIES. (4 Credits)
A survey of Native American cultures and history, both prior to and following contact with Europeans. Introduces the key contemporary issues and questions in the field of Native American studies. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 241H

ES 241H. *INTRODUCTION TO NATIVE AMERICAN STUDIES. (4 Credits)
A survey of Native American cultures and history, both prior to and following contact with Europeans. Introduces the key contemporary issues and questions in the field of Native American studies. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ES 243. *NATIVE AMERICAN ASSIMILATION AND ACTIVISM. (4 Credits)
Comprehensive course dealing with Native American experiences in the United States. Focuses on tribal and individual Native American activism and responses to government policies and cultural practices of assimilation since 1900. (Bacc Core Course) (H) (NC)
Attributes: CPDP – Core, Pers, Cult Diversity; CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ES 260. *INTRODUCTION TO PACIFIC ISLANDS STUDIES. (4 Credits)
Introduction to the geography, societies, histories, cultures, and contemporary issues of Oceania (Pacific islands). Especially concerned with the experience of indigenous communities and the representations generated inside and outside Oceania. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

ES 270. MAKING ALLIANCES AND SOLIDARITIES. (4 Credits)
Examines the history of social justice movement alliances and solidarity work. Students will learn from case studies and analyses of successes and failures in collaborations across race, gender, class, sexuality, and indigenous communities. Students will extend course learning via experiential projects requiring the application and practice of alliances-making and solidarity principles.

ES 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 311. NARRATIVES OF LATINO MIGRATIONS. (3 Credits)
A study of the scholarship and creative literature dealing with migrations from Mexico and other Latin American countries to the United States.
Attributes: LACH – Liberal Arts Humanities Core

ES 321. AFRICAN AMERICAN POLITICAL AND SOCIAL THOUGHT: 20TH CENTURY. (4 Credits)
This interdisciplinary course examines the dialogues, conflicts and representations produced by African Americans beginning with the closing years of the 19th century (1895) and ending with the opening days of World War II. (SS)
Attributes: LACS – Liberal Arts Social Core

ES 323. CONTEMPORARY AFRICAN AMERICAN SOCIAL DISCOURSE. (4 Credits)
Interdisciplinary course examines key African American political discourse(s) that emerged in response to major social and cultural transformations occurring in the United States after World War II to the present. (SS)
Attributes: LACS – Liberal Arts Social Core

ES 332. ASIAN PACIFIC AMERICANS AND THE MEDIA. (4 Credits)
A broad study of representations of Asians, Pacific Islanders, and Asian Pacific Americans in various US media, including media produced by Asian Pacific Americans themselves.
Attributes: LACH – Liberal Arts Humanities Core
ES 334. *ASIAN PACIFIC AMERICAN LITERATURE. (4 Credits)
An examination of various works by Asian Pacific American writers and some of the critical debates surrounding them. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPLA – Core, Pers, Lit and Arts

ES 345. NATIVE AMERICANS IN OREGON. (4 Credits)
Analysis and understanding of the complex experiences of Native Americans in the present state of Oregon, from early contact with those of other ethnicities to contemporary demographic contexts. (H) (NC)
Attributes: LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ES 350. *PUBLIC DISCOURSE AND WRITINGS ON RACE. (4 Credits)
Explores historical and contemporary cases of private, political, and public discourse on race and difference. Students will study diverse examples to explore strategies and methods of dominant and resistant discourse, as well as their social and material impacts. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ES 351. *ETHNIC MINORITIES IN OREGON. (4 Credits)
Exploration of the cultures and contributions of major ethnic groups in the state of Oregon. With timelines, oral histories, and audiovisual aids, the course will allow students to learn the ethnic and regional diversity in Oregon history. (Bacc Core Course) (H)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

ES 353. *ENVIRONMENTAL RACISM. (4 Credits)
Introduces environmental racism; the unequal impact of environmental harm on communities of color and indigenous peoples. Presents empirical evidence and theoretical frames, and explores efforts by government, residents, and activists to combat it. Considers questions of environmental justice via social structure, public access, open space, indigeneity, food, and media. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 353H

ES 353H. *ENVIRONMENTAL RACISM. (4 Credits)
Introduces environmental racism; the unequal impact of environmental harm on communities of color and indigenous peoples. Presents empirical evidence and theoretical frames, and explores efforts by government, residents, and activists to combat it. Considers questions of environmental justice via social structure, public access, open space, indigeneity, food, and media. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 353

ES 354. *LITERATURE OF ETHNIC MINORITIES IN THE UNITED STATES. (4 Credits)
An examination of various literary works by ethnic minorities addressing issues of race and ethnicity in U.S. culture and society. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ES 355. *RACE, SPACE, AND DIFFERENCE. (4 Credits)
A hands-on approach to exploring how we make space, and why geography is always infused with markers of social identity and exercises of power. Will practice ‘reading’ space and landscapes, and learn how notions of race and other forms of ‘difference’ shape space (and vice versa) to produce experiences of inclusion, exclusion, cooperation, and conflict. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 355H

ES 355H. *RACE, SPACE, AND DIFFERENCE. (4 Credits)
A hands-on approach to exploring how we make space, and why geography is always infused with markers of social identity and exercises of power. Will practice ‘reading’ space and landscapes, and learn how notions of race and other forms of ‘difference’ shape space and (vice versa) to produce experiences of inclusion, exclusion, cooperation, and conflict. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 355

ES 357. *FARMWORKER JUSTICE MOVEMENTS. (4 Credits)
Justice movements for farmworkers have a long and storied past in the annals of US history. This course begins with the 1960s Chicano civil rights era struggles for social justice. Focus on the varied strategies of four farmworker justice movements: United Farm Workers, Farm Labor Organizing Committee, Pineros y Campesinos Unidos Noroeste, and the Coalition of Immokalee Workers. The course is structured around the question of the movement and its various articulations. Course covers central themes and strategies that comprise the core of farmworker movements but is designed to allow students to explore other articulations they find relevant. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 357H

ES 357H. *FARMWORKER JUSTICE MOVEMENTS. (4 Credits)
Justice movements for farmworkers have a long and storied past in the annals of US history. This course begins with the 1960s Chicano civil rights era struggles for social justice. Focus on the varied strategies of four farmworker justice movements: United Farm Workers, Farm Labor Organizing Committee, Pineros y Campesinos Unidos Noroeste, and the Coalition of Immokalee Workers. The course is structured around the question of the movement and its various articulations. Course covers central themes and strategies that comprise the core of farmworker movements but is designed to allow students to explore other articulations they find relevant. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 357

ES 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSLISTED as ES 361/ QS 361/WGSS 361/WLC 361.
Equivalent to: ES 361, WGSS 361, WLC 361
Recommended: Prior filmmaking experience

ES 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ANTH 373, WGSS 373, WLC 373
ES 375. *ARTS AND SOCIAL JUSTICE. (4 Credits)
Explores concepts of structural inequality, difference, power, and discrimination through a critical survey of arts activism. Think critically about artwork and artists which address a number of social issues in the United States, including race, ethnicity, class, gender, sexuality, immigration, and indigeneity. CROSSLISTED as ES 375/QS 375/WGSS 375.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 375, WGSS 375.

ES 377. *HEALTH AND SOCIAL JUSTICE. (4 Credits)
Introduction to the intersection of health and social justice, to better understand socially unjust health differences (inequities) present in communities across the United States and abroad. Examination of relevant historical issues, theories of justice, human rights, and empirical evidence of health inequities, with an emphasis in critical analysis and applied knowledge. Overview of community-engaged participatory approaches that may be used to address social injustices and health inequities. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

ES 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ES 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ES 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ES 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ES 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

ES 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ES 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 416. MIGRANT HEALTH. (4 Credits)
An overview of major health and health care issues related to immigrant communities in the United States. From an ecological perspective, students gain an understanding of the theories and realities about migration and the migration-health relationship. In particular, the situation of migrant and seasonal farmworkers in the Pacific Northwest is analyzed. Specific topics include assimilation and acculturation, access to care, protective practices (the so-called Latino paradox), migrant health centers and community health workers, environmental and occupational issues, immigrant families.

ES 431. *QUEER OF COLOR CRITIQUES. (4 Credits)
'Queer of color critiques' refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 431, WGSS 431.

ES 437. *(EN)GENDERING ASIAN PACIFIC AMERICA. (4 Credits)
An examination of intersecting articulations of race, class, gender, sexuality, and ethnicity as they relate to and are addressed by Asian Pacific Americans. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: ES 431

ES 444. NATIVE AMERICAN LAW: TRIBES, TREATIES, AND THE UNITED STATES. (4 Credits)
Examination of the parameters of native treaty relationships with the federal and state governments, and considers the future of these agreements.
Attributes: LACN – Liberal Arts Non-Western Core; LACS – Liberal Arts Social Core

ES 445. *NATIVE AMERICAN SCIENCE AND TECHNOLOGY. (4 Credits)
Examination of scientific and technological discovery, continuity, and change among indigenous peoples, with particular emphasis on selected communities of pre- and post-European contact North America. (Bacc Core Course) (H) (NC)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 445H

ES 445H. *NATIVE AMERICAN SCIENCE AND TECHNOLOGY. (4 Credits)
Examination of scientific and technological discovery, continuity, and change among indigenous peoples, with particular emphasis on selected communities of pre- and post-European contact North America. (Bacc Core Course) (H) (NC)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 445

ES 448. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 448, REL 448

ES 451. THEORIES OF RACE AND ETHNICITY. (4 Credits)
A seminar examining various theories of race and ethnicity, their historical contexts, and applications.
ES 452. *ETHNICITY IN FILM. (4 Credits)
Using ethnicity and gender as primary frames of reference, this upper-division/graduate level seminar seeks to introduce students to critical film theory and examine ethnicity and gender as a force both in front of and behind the camera. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACN – Liberal Arts Non-Western Core

ES 453. *ETHNOHISTORY METHODOLOGY. (4 Credits)
A seminar developing techniques for collecting, analyzing, and incorporating ethnic community histories in research papers and theses. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

ES 455. INTERNSHIP SEMINAR. (1 Credit)
Prepares students for the internship and provides an opportunity to explore career options and/or graduate study.
Recommended: ES 101 and ES 201

ES 457. *LITERATURE BY WOMEN OF COLOR IN THE UNITED STATES. (4 Credits)
An examination of works by various women writers of color and their treatment of issues such as race, ethnicity, class, sexuality, and gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

ES 458. RACIAL PATTERNS OF URBANIZATION. (4 Credits)
This interdisciplinary course will examine the linkages between race and patterns of urbanization. It will examine how ideologies about race, gender, and class have set the themes of debate and discussion about urbanization in both theoretical and popular discourses.

ES 459. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas— as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ES 469/PS 469/WLC 469 and ES 569/PS 569/WLC 569.
Equivalent to: ANTH 459, WLC 459

ES 460. ETHNICITY AND SOCIAL JUSTICE. (4 Credits)
Seminar examines inequities and social justice issues in contemporary U.S. society, particularly dimensions of race and ethnicity in our public policies and practices impacting communities in areas such as housing, poverty, employment, public health, education, law enforcement, and the environment.

ES 461. RACISM AND THE PRISON INDUSTRIAL COMPLEX. (4 Credits)
The prison industrial/punishment complex in the late 20th and early 21st centuries has become a growth industry with the privatization of prisons, and mass incarceration of mostly people-of-color. This course examines the history and growth of this industry and the implications that it has on this democracy.

ES 463. US EMPIRE/IMPERIALISM, SETTLER/COLONIALISM, CAPITALISM/RACE. (4 Credits)
How and when did the United States become an empire? This course approaches the historical and contemporary actions of the United States as both a continental and global empire through historiography, socio-political, economic, and racial analyses of U.S. hegemony. Students will learn from recent interdisciplinary scholars who have worked to understand the development of U.S. empire as a series of overlapping cultural projects in the homeland, and beyond the borders of the United States as mutually constitutive of political, and economic, and cultural processes of empire-building, that is capital accumulation, and power.

ES 464. FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: FCSJ 464

ES 472. *INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
"Two-spirit" refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/WGSS 572. (Writing Intensive Course).
Attributes: CWIC – Core, Skills, WIC
Equivalent to: QS 472, WGSS 472
Recommended: QS 262 or ES 242 or WGSS 414

ES 477. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
Queer/trans people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: QS 477, WGSS 477
Recommended: QS 262 and QS 462

ES 483. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 483, PS 483, WLC 483
ES 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSTLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D-] or ES 410 [D-] or WGSS 410 [D-] or WLC 410 [D-])
Equivalent to: ANTH 485, WGSS 485, WLC 485
This course is repeatable for 4 credits.

ES 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 500. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ES 501. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ES 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ES 504. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ES 505. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 506. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ES 507. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 508. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ES 509. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student’s research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSTLISTED as ANTH 515/CSSA 515/ES 515/WGSS 515.
Equivalent to: ANTH 515, CSSA 515, WGSS 515

ES 516. MIGRANT HEALTH. (4 Credits)
An overview of major health and health care issues related to immigrant communities in the United States. From an ecological perspective, students gain an understanding of the theories and realities about migration and the migration-health relationship. In particular, the situation of migrant and seasonal farmworkers in the Pacific Northwest is analyzed. Specific topics include assimilation and acculturation, access to care, protective practices (the so-called Latino paradox), migrant health centers and community health workers, environmental and occupational issues, immigrant families.

ES 531. QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSTLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531.
Equivalent to: QS 531, WGSS 531

ES 537. (EN)GENDERING ASIAN PACIFIC AMERICA. (4 Credits)
An examination of intersecting articulations of race, class, gender, sexuality, and ethnicity as they relate to and are addressed by Asian Pacific Americans.
Equivalent to: ES 531

ES 544. NATIVE AMERICAN LAW: TRIBES, TREATIES, AND THE U.S.. (4 Credits)
Examination of the parameters of native treaty relationships with the federal and state governments, and considers the future of these agreements.

ES 548. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSTLISTED as ES 448/PHEL 448/REL 448 and ES 548/PHEL 548/REL 548.
Equivalent to: PHEL 548, REL 548

ES 551. THEORIES OF RACE AND ETHNICITY. (4 Credits)
A seminar examining various theories of race and ethnicity, their historical contexts, and applications.

ES 552. ETHNICITY IN FILM. (4 Credits)
Using ethnicity and gender as primary frames of reference, this upper-division/graduate level seminar seeks to introduce students to critical film theory and examine ethnicity and gender as a force both in front of and behind the camera.

ES 553. ETHNOHISTORY METHODOLOGY. (4 Credits)
A seminar developing techniques for collecting, analyzing, and incorporating ethnic community histories in research papers and theses.

ES 557. LITERATURE BY WOMEN OF COLOR IN THE UNITED STATES. (4 Credits)
An examination of works by various women writers of color and their treatment of issues such as race, ethnicity, class, sexuality, and gender.

ES 558. RACIAL PATTERNS OF URBANIZATION. (4 Credits)
This interdisciplinary course will examine the linkages between race, ethnicity, class, and patterns of urbanization. It will examine how ideologies about race, gender, and class have set the themes of debate and discussion and about urbanization in both theoretical and popular discourses.
ES 559. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas— as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSTLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ANTH 559, WLC 559

ES 560. ETHNICITY AND SOCIAL JUSTICE. (4 Credits)
Seminar examines inequities and social justice issues in contemporary U.S. society, particularly dimensions of race and ethnicity in our public policies and practices impacting communities in areas such as housing, poverty, employment, public health, education, law enforcement, and the environment.

ES 561. RACISM AND THE PRISON INDUSTRIAL COMPLEX. (4 Credits)
The prison industrial/punishment complex in the late 20th and early 21st centuries has become a growth industry with the privatization of prisons, and mass incarceration of mostly people-of-color. This course examines the history and growth of this industry and the implications that it has on this democracy.

ES 563. US EMPIRE/IMPERIALISM, SETTLER/COLONIALISM, CAPITALISM/RACE. (4 Credits)
How and when did the United States become an empire? This course approaches the historical and contemporary actions of the United States as both a continental and global empire through historiography, socio-political, economic, and racial analyses of U.S. hegemony. Students will learn from recent interdisciplinary scholars who have worked to understand the development of U.S. empire as a series of overlapping cultural projects in the homeland, and beyond the borders of the United States as mutually constitutive of political, and economic, and cultural processes of empire-building, that is capital accumulation, and power.

ES 564. FOOD AND ETHNIC IDENTITY: DECOLONIZING OUR FOOD AND BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSTLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564.
Equivalent to: FCSJ 564

ES 569. TOPICS IN JOTERIA STUDIES. (3 Credits)
A space for engaging with arts, activism and scholarship emerging from queer Latin@/Chican@ experiences and consciousness is provided. Offered winter term in odd years. CROSSTLISTED as ES 569/ QS 569/ SPAN 569/ WGSS 569.
Equivalent to: QS 569, SPAN 569, WGSS 569
This course is repeatable for 6 credits.

ES 572. INDIGENOUS TWO-SPRIT AND QUEER STUDIES. (4 Credits)
'Two-spirit' refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSTLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/WGSS 572.
Equivalent to: QS 572, WGSS 572
Recommended: QS 262 or ES 242 or WGSS 414 or WGSS 514

ES 575. CRITICAL RACE FEMINISM AND OUTSIDER JURISPRUDENCE. (4 Credits)
Critical exploration of critical legal justice movements and their relationship to social identities. Seminar emphasizes specific legal cases, federal and state laws, and constitutional issues that impact groups deemed outsiders in legal discourse as well as their social implications. The critical justice movement and anti-subordination struggles will be explored via case analyses that shape race, class, gender, sexuality, and disability relations. Theoretical contributions of law and society, critical race theory. LatCrit, and critical race feminism, critical white studies, critical mixed race studies, OutCrit, ClassCrit, and critical disability studies applied to historical precedent and current attempts at marginalizing/empowering communities. CROSSTLISTED as ES 575/ WGSS 575.
Equivalent to: WGSS 575

ES 577. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSTLISTED as ES 477/QS 477/ WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: QS 577, WGSS 577
Recommended: QS 262 and QS 464

ES 583. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/ their program of study. CROSSTLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 583, PS 583, WLC 583

ES 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

Food in Culture and Social Justice

FCSJ 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
FCSJ 261. *FOOD IN AMERICAN CULTURE. (3 Credits)
Fosters understanding of the meanings of foods and foodways in American culture. Uses food as a lens to explore general topic areas such as work, family, ecology, and identity. Critically examines core issues that shape and have shaped American culture. CROSSLISTED as ANTH 261/ FCSJ 261. (Bacc Core Course) (SS)
Attributes: CPWC – Core, Pers, West Culture; LACS – Liberal Arts Social Core
Equivalent to: ANTH 261

FCSJ 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 361. *FOOD JUSTICE. (4 Credits)
Contemporary food systems are examined from a cultural and social justice perspective. The human right to food as recognized by the United Nations serves as the justice grounding point. Impediments to realizing the right to food will be examined in national and international contexts. CROSSLISTED as ANTH 361/FCSJ 361. (Bacc Core Course) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Equivalent to: ANTH 361

FCSJ 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 403. THESIS. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 405. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 406. FOOD PROJECTS. (1-6 Credits)
Graded P/N.
This course is repeatable for 6 credits.

FCSJ 407. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.

FCSJ 410. INTERNSHIP. (1-16 Credits)
Opportunities for students to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members.
This course is repeatable for 16 credits.
Recommended: 6 credits of FCSJ

FCSJ 422. INTERCULTURAL LEARNING COMMUNITY. (3-6 Credits)
Taught as a learning community combining students, professors and community members to explore contemporary food-related questions in two different countries. Syllabus content will change depending on 1) The countries chosen, 2) The questions that are most of interest to the members of the community. Depending on the year, up to 25% of the time might be spent on the Corvallis campus.
Prerequisites: FCSJ 454 with C- or better
This course is repeatable for 6 credits.

FCSJ 444. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, paleodietary assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Prerequisites: ANTH 240 with C or better or ANTH 330 with C or better
Equivalent to: ANTH 444

FCSJ 454. *INTERNATIONAL PERSPECTIVES ON FOOD SYSTEMS. (4 Credits)
Macro and micro-comparative overview of food systems in at least two different international settings, highlighting the influences of culture, social structure, geography, and economy on food systems. Non-traditional and emerging theoretical critiques of such influences on food systems are highlighted. (Bacc Core Course) (H) (SS) (NC)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core; LACS – Liberal Arts Social Core

FCSJ 464. FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: ES 464

FCSJ 467. CAPSTONE: FOOD IN CULTURE AND SOCIAL JUSTICE. (1 Credit)
Working under the supervision of a Food in Culture and Social Justice faculty person, students further engage with a topic previously explored in FCSJ course work and produce a 5-page paper and public poster, presentation or website that demonstrates critical thinking and writing competencies about food, culture and social justice. Graded P/N.
Equivalent to: ANTH 467
Recommended: Completion or concurrent enrollment in the last coursework for the FCSJ undergraduate certificate

FCSJ 486. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Attributes: LACS – Liberal Arts Social Core
Equivalent to: ANTH 486
Recommended: 3 credits of social science.

FCSJ 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 501. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.
FCSJ 503. THESIS. (1-12 Credits)
This course is repeatable for 999 credits.

FCSJ 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 506. FOOD PROJECTS. (1-6 Credits)
Graded P/N.
This course is repeatable for 6 credits.

FCSJ 507. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.

FCSJ 510. GRADUATE INTERNSHIP. (1-16 Credits)
Opportunities for students to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members.
This course is repeatable for 16 credits.
Recommended: 6 credits of FCSJ

FCSJ 522. INTERCULTURAL LEARNING COMMUNITY. (3-6 Credits)
Taught as a learning community combining students, professors and community members to explore contemporary food-related questions in two different countries. Syllabus content will change depending on 1) The countries chosen, 2) The questions that are most of interest to the members of the community. Depending on the year, up to 25% of the time might be spent on the Corvallis campus.
Prerequisites: FCSJ 554 with C or better
This course is repeatable for 6 credits.

FCSJ 544. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, paleodietary assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Equivalent to: ANTH 544
Recommended: ANTH 240 or ANTH 330

FCSJ 547. METHODS IN FOOD IN CULTURE AND SOCIAL JUSTICE. (4 Credits)
Exposes graduate students to the methodological approaches and methods used in guiding empirical research on the socio-cultural aspects of food, focusing on vulnerable populations, food security, procurement, foodways, disasters, and climate change. Methodological approaches and methods as evidenced in peer-reviewed publications is the grounding for the course. CROSSLISTED as ANTH 547/FCSJ 547.
Equivalent to: ANTH 547

FCSJ 554. INTERNATIONAL PERSPECTIVES ON FOOD SYSTEMS. (4 Credits)
Macro and micro-comparative overview of food systems in at least two different international settings, highlighting the influences of culture, social structure, geography, and economy on food systems. Non-traditional and emerging theoretical critiques of such influences on food systems are highlighted.

FCSJ 564. FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564.
Equivalent to: ES 564

FCSJ 567. AGRI-FOOD MOVEMENTS. (4 Credits)
Investigates the origins and contemporary status of producer and consumer food movements including, but not limited to, organics, agricultural labor movements, animal welfare, vegetarian and vegan movements, farmers' markets, and permaculture. CROSSLISTED as ANTH 567/FCSJ 567.
Equivalent to: ANTH 567

FCSJ 568. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Equivalent to: ANTH 586
Recommended: 3 credits of social science.

FCSJ 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

French

FR 111. FIRST-YEAR FRENCH. (4 Credits)
Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with no prior training in French. Native and/or bilingual speakers of French will not receive credit for FR 111, FR 112, FR 113. Lec/rec.

FR 112. FIRST-YEAR FRENCH. (4 Credits)
Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with no prior training in French. Native and/or bilingual speakers of French will not receive credit for FR 111, FR 112, FR 113. Lec/rec.
Prerequisites: FR 111 with D- or better or placement test

FR 113. FIRST-YEAR FRENCH. (4 Credits)
Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with no prior training in French. Native and/or bilingual speakers of French will not receive credit for FR 111, FR 112, FR 113. Lec/rec.
Prerequisites: FR 112 with D- or better or placement test

FR 121. SURVIVAL FRENCH FOR STUDENTS AND TRAVELERS. (3 Credits)
Provides practical linguistic tools for short stays in France. Basic conversation skills, pronunciation, introduction to French non-verbal language, as well as cultural tools, introduction to French etiquette, visual dictionary, and tips for avoiding cross-cultural misunderstandings common between Americans and the French.

FR 188. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society.
This course is repeatable for 12 credits.
FR 199. SPECIAL STUDIES. (1-16 Credits)
Conversation, pronunciation, vocabulary-building, etc. Supplements basic sequence FR 111, FR 112, FR 113. May be repeated for credit when topic varies.
This course is repeatable for 16 credits.

FR 211. SECOND-YEAR FRENCH. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of French will not receive credit for FR 211, FR 212, FR 213. Lec/rec.
Prerequisites: FR 111 with D- or better or placement test

FR 212. SECOND-YEAR FRENCH. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Completion of FR 211 with a grade of C- or better satisfies BA requirement in foreign languages. Native and/or bilingual speakers of French will not receive credit for FR 211, FR 212, FR 213. Lec/rec.
Prerequisites: FR 211 with D- or better or placement test

FR 213. SECOND-YEAR FRENCH. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Completion of FR 212 with a grade of C- or better satisfies BA requirement in foreign languages. Native and/or bilingual speakers of French will not receive credit for FR 211, FR 212, FR 213. Lec/rec.
Prerequisites: FR 212 with D- or better or placement test

FR 288. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society.
This course is repeatable for 12 credits.

FR 299. SPECIAL STUDIES. (1-16 Credits)
Conversation, pronunciation, vocabulary-building, etc. Supplements basic sequence FR 211, FR 212, FR 213. May not be offered every year. May be repeated for credit when topic varies.
This course is repeatable for 16 credits.

FR 300. ADVANCED FRENCH CONVERSATION. (3 Credits)
Focuses on oral communication through extensive listening and speaking practice in French. Students will interact with francophone cultures and the French language through personal research and presentations, exchanges with native and non-native francophone speakers, as well as through diverse authentic documents. Time will be dedicated to a targeted practice of French pronunciation, topical vocabulary and idiomatic expressions. Some reading and writing will also be required to develop oral skills. Native speakers of French are not eligible to take this course.
Prerequisites: FR 311 with C- or better

FR 311. THIRD-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French.
Prerequisites: FR 213 with C- or better or placement test

FR 312. THIRD-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French.
Prerequisites: FR 311 with C- or better or placement test

FR 313. THIRD-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French.
Prerequisites: FR 312 with C- or better or placement test

FR 315. FRENCH FOR BUSINESS. (3 Credits)
Recommended: FR 213

FR 319. SELECTED TOPICS IN FRENCH LANGUAGE. (3 Credits)
Skill-orientation variable. Conducted in French. May be repeated for credit when topic varies.
This course is repeatable for 9 credits.

FR 321. FRENCH CONVERSATION FOR ADVANCED SPEAKERS I. (1 Credit)
Designed for students who would like to continue developing basic listening and speaking skills in French through independent work with a variety of media. Graded P/N.
Prerequisites: FR 213 with D- or better

FR 322. FRENCH CONVERSATION FOR ADVANCED SPEAKERS II. (1 Credit)
Designed for students who would like to continue developing basic listening and speaking skills in French through independent work with a variety of media.
Prerequisites: FR 213 with D- or better

FR 323. FRENCH CONVERSATION FOR ADVANCED SPEAKERS III. (1 Credit)
Designed for students who would like to continue developing basic listening and speaking skills in French through independent work with a variety of media.
Prerequisites: FR 213 with D- or better

FR 333. FRENCH CULTURE AND SOCIETY SINCE THE REVOLUTION. (3 Credits)
Cultural life of the French people from 1789 to the present. Conducted in French. Need not be taken in order. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 6 credits of 300-level French

FR 336. QUEBEC: TEXTS AND CONTEXTS. (3 Credits)
Intended for intermediate and advanced students in French. Offers an introductory knowledge of Quebec. Discussions and readings cover a variety of topics, including geography, history, cinema, literature, popular culture, the language issue, American and French influences, ethnic diversity and immigration, among other topics of interest.
Prerequisites: FR 211 with D- or better

FR 339. FRENCH: FRANCOPHONE STUDIES. (3 Credits)
May be repeated for credit when topic varies. Not offered every year.
Equivalent to: FR 339H
This course is repeatable for 9 credits.
FR 340. INTRODUCTION TO FRENCH LITERARY STUDIES. (3 Credits)
Concepts and vocabulary fundamental to the study of French literature; general view of the main currents of French literary history; introduction to French versification; techniques of literary analysis; practice in literary analysis and in writing about literature; explication de texte. Conducted in French. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: FR 213

FR 343. THE SHORT STORY: WOMEN IN THE FRANCOPHONE WORLD. (3 Credits)
A selection of short stories written by francophone women representing various regions of the French-speaking world. These stories revolve around contemporary issues affecting and of interest particularly to women in these francophone societies. Among major themes will be immigration, conditions of women, quest for identity, tradition versus modernity, and other related topics.
Prerequisites: FR 311 with C or better

FR 349. SELECTED TOPICS IN FRANCOPHONE LITERATURE. (3 Credits)
Literary works, themes, movements, or authors from French-speaking areas of the world. Conducted in French. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.

FR 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students. Assignments as proctors or tutors in lower-division French courses. No more than 2 credits may be used to satisfy degree requirements for a major in French; may not be used to satisfy requirements for a minor in French. Graded P/N. This course is repeatable for 6 credits.
Recommended: Completion of 12 upper-division credits in French, including FR 311, FR 312, FR 313 and FR 351, with a minimum 3.0 GPA

FR 388. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society.
This course is repeatable for 12 credits.

FR 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

FR 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FR 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

FR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FR 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FR 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FR 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

FR 411. FOURTH-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; analysis of writing styles and techniques; oral reports and original presentations in French; original compositions. Conducted in French.
Prerequisites: FR 313 with D- or better

FR 421. FRENCH CONVERSATION FOR ADVANCED SPEAKERS IV. (1 Credit)
Designed for students who would like to continue developing listening and speaking skills in French through independent work with a variety of media. Graded P/N.
Prerequisites: FR 313 with D- or better

FR 422. FRENCH CONVERSATIONS FOR ADVANCED SPEAKERS V. (1 Credit)
Designed for students who would like to continue developing listening and speaking skills in French through independent work with a variety of media. Graded P/N.
Prerequisites: FR 313 with D- or better

FR 423. FRENCH CONVERSATION FOR ADVANCED SPEAKERS VI. (1 Credit)
Designed for students who would like to continue developing listening and speaking skills in French through independent work with a variety of media.
Prerequisites: FR 313 with D- or better

FR 439. *FRENCH/FRANCOPHONE STUDIES. (3 Credits)
Variable topics in language, culture, or literature. May be repeated for credit when topic varies. Conducted in French. Not offered every year.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 9 credits.

FR 449. SELECTED TOPICS IN FRANCOPHONE LITERATURE. (3 Credits)
Conducted in French. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.

FR 488. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French Society.
This course is repeatable for 12 credits.

FR 499. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
Equivalent to: FR 499H
This course is repeatable for 9 credits.

FR 499H. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. See Schedule of Classes for current offerings and prerequisites. Not offered every year.
Attributes: HNRS – Honors Course Designator
Equivalent to: FR 499
This course is repeatable for 9 credits.

FR 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FR 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

FR 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FR 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FR 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
FR 511. FOURTH-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; analysis of writing styles and techniques; oral reports and original presentations in French; original compositions. Conducted in French.
Recommended: FR 313
FR 539. FRENCH/FRANCOPHONE STUDIES. (3 Credits)
Variable topics in language, culture, or literature. May be repeated for credit when topic varies. Conducted in French. See Schedule of Classes for current topics and prerequisites. Not offered every year.
This course is repeatable for 12 credits.
FR 588. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society.
This course is repeatable for 12 credits.

German
GER 100. BASIC GERMAN. (5 Credits)
Exposes students to the basic elements of German grammar, vocabulary, speaking and listening. This course fulfills the Deficient in a Foreign Language (DFL) admission requirement. Course credits do not count towards the BA requirement in a second language, German minor, German major, German language certificate or International Degree. Taught in English.

GER 111. FIRST-YEAR GERMAN. (4 Credits)
Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111, GER 112, or GER 113. Lec/lab/rec.

GER 112. FIRST-YEAR GERMAN. (4 Credits)
Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111, GER 112, or GER 113. Lec/lab/rec.
Prerequisites: GER 111 with D- or better

GER 113. FIRST-YEAR GERMAN. (4 Credits)
Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111, GER 112, or GER 113. Lec/lab/rec.
Prerequisites: GER 112 with D- or better

GER 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

GER 211. SECOND-YEAR GERMAN. (4 Credits)
Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of second-year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Native or bilingual speakers of German will not receive credit for GER 211, GER 212 or GER 213. Lec/lab/rec.
Prerequisites: GER 113 with D- or better

GER 212. SECOND-YEAR GERMAN. (4 Credits)
Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of Second-Year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Native or bilingual speakers of German will not receive credit for GER 211, GER 212, or GER 213. Lec/rec.
Prerequisites: GER 211 with D- or better

GER 213. SECOND-YEAR GERMAN. (4 Credits)
Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of Second-Year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Completion of GER 213 with grade of C- or better satisfies BA requirement in foreign languages. Native or bilingual speakers of German will not receive credit for GER 211, GER 212, or GER 213. Lec/rec.
Prerequisites: GER 212 with D- or better

GER 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

GER 311. THIRD-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. Required of German majors and minors.
Prerequisites: GER 213 with C or better

GER 312. THIRD-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. Required of German majors and minors.
Prerequisites: GER 213 with C- or better

GER 313. THIRD-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. Both courses required of German majors and minors.
Prerequisites: GER 213 with C- or better

GER 319. SELECTED TOPICS IN GERMAN LANGUAGE. (3 Credits)
Focus on development of German language skills and/or history of the language. Conducted in German. May be repeated for credit when topic varies. Lec/rec. Not offered every year.
This course is repeatable for 9 credits.

GER 329. SELECTED TOPICS IN LITERATURE AND/OR CULTURE. (3 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.

GER 331. *GERMAN CULTURE. (3 Credits)
Aspects of history, politics, art, music, literature, and everyday life in German-speaking countries. Attention to development of German language skills. Conducted in German. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: GER 213

GER 332. *GERMAN CULTURE. (3 Credits)
Aspects of history, politics, art, music, literature, and everyday life in German-speaking countries. Attention to development of German language skills. Conducted in German. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Prerequisites: GER 213 with D- or better
GER 339. SELECTED TOPICS IN GERMAN CULTURE. (3 Credits)
Focus on specific aspects of German culture. Attention to development of German language skills. Conducted in German. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.
Recommended: Completion of 9 credits from GER 311, GER 312, GER 313.

GER 349. SELECTED TOPICS IN GERMAN LITERATURE. (3 Credits)
Attention to development of German language skills. Conducted in German. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.
Recommended: GER 213

GER 351. GERMAN PRONUNCIATION AND PHONETICS. (3 Credits)
Analysis of the fundamentals of the German sound system, including pronunciation, phonology, phonetic and contrastive analysis of sounds; phonemes, intonation, and tone patterns. Required of students working toward a teaching certificate in German. Not offered every year.
This course is repeatable for 9 credits.
Recommended: GER 213

GER 355. TRANSLATION. (3 Credits)
Introduces students to translation studies in theory and practice. Students will learn problems behind translating texts and strategies to overcome these issues, before working on shorter and longer translation projects of a variety of texts. Taught in English.
Prerequisites: GER 312 with D- or better

GER 361. CRITICAL ISSUES OF GERMAN CINEMA. (3 Credits)
Critique of current scholarly debates in German cinema (popular cinema, stars, institutional and cultural frameworks, cultural politics, and transnational connections) in connection with the critical viewing of a large variety of films from various periods. Taught in English.
Prerequisites: GER 311, GER 312

GER 362. DIVIDED SCREEN: GERMAN CINEMA BETWEEN 1945 AND 1990. (3 Credits)
Introduces German cinema between the corner dates 1945–division into East and West–and German unification in 1990. Compares and contrasts films made in East and West Germany to understand differences and similarities in the political and cultural set-up of the two states.

GER 363. CONTEMPORARY GERMAN CINEMA. (3 Credits)
Introduces German cinema after unification in 1990. Analyzes German films from various genres, ‘schools,’ and directors. Reflects and compares contemporary issues of Germany, Austria, and Switzerland to Hollywood cinema.

GER 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students, with assignments as proctors or tutors in lower-division German language courses. No more than 2 credits may be used to satisfy degree requirements for a major in German; no credit may be used to satisfy requirements for a minor in German. Graded P/N.
This course is repeatable for 6 credits.
Recommended: Completion of 12 upper-division credits in German, including GER 311, GER 312, GER 313

GER 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

GER 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

GER 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

GER 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

GER 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

GER 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

GER 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

GER 411. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GER 313 with C- or better

GER 412. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Prerequisites: GER 411 with C- or better

GER 413. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Prerequisites: GER 412 with C- or better

GER 421. GERMAN LANGUAGE TANDEM. (1 Credit)
Optional course that can be taken to fine-tune advanced German speaking skills with the help of a native speaker. Graded P/N.
This course is repeatable for 6 credits.

GER 449. SELECTED TOPICS IN GERMAN LITERATURE. (3 Credits)
May be repeated for credit when topic varies. Conducted in German.
This course is repeatable for 9 credits.
Recommended: 9 upper-division credits in German.

GER 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

GER 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

GER 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

GER 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

GER 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

GER 511. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Recommended: GER 313

GER 512. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Recommended: GER 411 or GER 511

GER 513. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Recommended: GER 412 or GER 512

GER 549. SELECTED TOPICS IN GERMAN LITERATURE. (3 Credits)
May be repeated for credit when topic varies. Conducted in German.
This course is repeatable for 9 credits.
Recommended: 9 upper-division credits in German.
**Hebrew**

HEBR 111. INTRODUCTION TO HEBREW. (4 Credits)
Prerequisites: HEBR 111 with D- or better
Development of listening comprehension, speaking, reading, and writing skills. Designed specifically for students with no prior training in Hebrew. Native speakers of Hebrew will not receive credit for HEBR 111, HEBR 112, HEBR 113.

HEBR 112. INTERMEDIATE HEBREW I. (4 Credits)
Prerequisites: HEBR 111 with D- or better
Development of listening comprehension, speaking, reading, and writing skills. Native speakers of Hebrew will not receive credit for HEBR 111, HEBR 112, HEBR 113.

HEBR 113. INTERMEDIATE HEBREW II. (4 Credits)
Prerequisites: HEBR 112 with D- or better
This course is repeatable for 16 credits.
Development of listening comprehension, speaking, reading, and writing skills. Native speakers of Hebrew will not receive credit for HEBR 211, HEBR 212, HEBR 213. Taught via Ecampus only.

HEBR 211. SECOND-YEAR HEBREW I. (4 Credits)
Prerequisites: HEBR 211 with D- or better
Further development of listening comprehension, speaking, reading, and writing skills. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 211. Taught via Ecampus only.

HEBR 212. SECOND-YEAR HEBREW II. (4 Credits)
Prerequisites: HEBR 211 with D- or better
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 211, HEBR 212, HEBR 213. Taught via Ecampus only.

HEBR 213. SECOND-YEAR HEBREW III. (4 Credits)
Prerequisites: HEBR 212 with D or better
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 211, HEBR 212, HEBR 213.

**Italian**

IT 111. FIRST-YEAR ITALIAN. (4 Credits)
Prerequisites: IT 111 with D- or better
Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111, IT 112, IT 113. Not offered every year.

IT 112. FIRST-YEAR ITALIAN. (4 Credits)
Prerequisites: IT 111 with D- or better
Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111, IT 112, IT 113. Not offered every year.

IT 113. FIRST-YEAR ITALIAN. (4 Credits)
Prerequisites: IT 112 with D- or better
Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111, IT 112, IT 113. Not offered every year.

**Japanese**

JPN 111. FIRST-YEAR JAPANESE. (4 Credits)
Prerequisites: JPN 111 with D- or better
This course is repeatable for 16 credits.
Development of listening comprehension, speaking, reading, and writing skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Lec/lab/rec.
JPN 112. FIRST-YEAR JAPANESE. (4 Credits)
Designed to help students develop an understanding of basic language structures and to acquire the ability to use them appropriately in a variety of practical, everyday social contexts. Primary focus is on verbal and non-verbal communication skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Lec/lab/rec.
Prerequisites: JPN 111 with D- or better

JPN 113. FIRST-YEAR JAPANESE. (4 Credits)
Designed to help students develop an understanding of basic language structures and to acquire the ability to use them appropriately in a variety of practical, everyday social contexts. Primary focus is on verbal and non-verbal communication skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Lec/lab/rec.
Prerequisites: JPN 111 with D- or better

JPN 199. SPECIAL STUDIES: INTENSIVE JAPANESE. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 211. SECOND-YEAR JAPANESE. (4 Credits)
Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Lec/lab/rec.
Prerequisites: JPN 113 with D- or better

JPN 212. SECOND-YEAR JAPANESE. (4 Credits)
Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Lec/lab/rec.
Prerequisites: JPN 211 with D- or better

JPN 213. SECOND-YEAR JAPANESE. (4 Credits)
Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Lec/lab/rec.
Prerequisites: JPN 212 with D- or better

JPN 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 311. THIRD-YEAR JAPANESE. (3 Credits)
Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. Lec/lab/rec.
Prerequisites: JPN 213 with C- or better or placement test

JPN 312. THIRD-YEAR JAPANESE. (3 Credits)
Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. Lec/lab/rec.
Prerequisites: JPN 311 with C- or better or placement test

JPN 313. THIRD-YEAR JAPANESE. (3 Credits)
Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. Lec/rec. Recommended: JPN 312

JPN 329. SPECIAL TOPICS IN LANGUAGE, CULTURE, OR LITERATURE. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 345. MULTIMODAL LITERACIES: JAPANESE. (2 Credits)
Introduction to the analysis and production of multimodal literacies. Study of semiotic resources such as language and images across modalities such as film, manga, and social media. Required of all majors in World Languages and Cultures. Taught in Japanese. Has to be taken in conjunction with the lecture session in English.
Corequisites: WLC 345
Recommended: JPN 213

JPN 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students, with assignment as proctor or tutor in lower-division Japanese courses. No credit may be used to satisfy requirements for a minor in Japanese. Graded P/N. This course is repeatable for 6 credits.

JPN 388. JAPANESE STUDIES, JAPANESE STUDY CENTER. (1-12 Credits)
May be repeated for credit when topic varies. This course is repeatable for 12 credits.

JPN 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

JPN 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

JPN 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

JPN 411. FOURTH-YEAR JAPANESE. (3 Credits)
Designed to help students apply grammatical points and expressions that they have learned from the first through the third year. It also stresses further development of reading and writing skills. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: JPN 313 with C- or better

JPN 412. FOURTH-YEAR JAPANESE. (3 Credits)
Further development of conversational, reading, and writing skills. Readings include excerpts from contemporary essays, short stories, novels, plays, and newspaper articles. Not offered every year.
Prerequisites: JPN 411 with C- or better

JPN 413. FOURTH-YEAR JAPANESE. (3 Credits)
Further development of conversational, reading, and writing skills. Readings include excerpts from contemporary essays, short stories, novels, plays, and newspaper articles. Not offered every year.
Prerequisites: JPN 412 with C- or better

JPN 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

JPN 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
**Korean**

**KOR 111. FIRST-YEAR KOREAN. (4 Credits)**
For students with no prior training in Korean. Basic language skills along with cultural understanding by introducing the history of Hangul, traditional holidays, games, songs, foods and drama. Provides the Korean alphabet (Hangul), basic vocabulary, grammar, listening, speaking, reading, and writing skills. Three areas of focus: (1) reading and writing the Korean alphabet; (2) basic colloquial expressions; and (3) cultural understanding.

**KOR 112. FIRST-YEAR KOREAN. (4 Credits)**
Basic language skills along with cultural understanding by introducing the history of Hangul, traditional holidays, games, songs, foods and drama. Provides the Korean alphabet (Hangul), basic vocabulary, grammar, listening, speaking, reading, and writing skills. Three areas of concentration: (1) reading and writing the Korean alphabet, (2) basic colloquial expressions, and (3) cultural understanding.

**Prerequisites:** KOR 111 with D- or better

**KOR 113. FIRST-YEAR KOREAN. (4 Credits)**
Designed to increase fluency in listening, speaking, reading and writing skills through various topics that are relevant to students' life, sports, health, experiences, housing. Enlarge vocabulary and knowledge of grammar and sentence structure with honorifics, adjectives, connectives, and comparatives. Discuss Korean culture and literature using folk tales.

**Prerequisites:** KOR 112 with D- or better

**KOR 211. SECOND-YEAR KOREAN. (4 Credits)**
Designed to increase fluency in listening, speaking, reading, and writing skills through pragmatic topics necessary for survival in the target language culture. Topic-based lessons consist of model dialogues, narration, vocabulary, grammar and culture corresponding to the level of intermediate low (ACTFL).

**Prerequisites:** KOR 113 with D or better or Korean 113 with a score of 1

**KOR 212. SECOND-YEAR KOREAN. (4 Credits)**
Designed to increase fluency in listening, speaking, reading, and writing skills through pragmatic topics necessary for survival in the target language culture. Topic-based lessons consist of model dialogues, narration, vocabulary, grammar, and culture corresponding to the level of Intermediate Mid (ACTFL). Students learn to describe favorite activities, feelings, foods, restaurants, fashions, colors, and physical appearances. Students also learn to engage in a conversation as well as to write compositions related to daily life, making recommendations, asking for and giving directions, making a telephone call, and writing a recipe.

**Prerequisites:** KOR 211 with D or better

**KOR 213. SECOND-YEAR KOREAN. (4 Credits)**
Designed to increase fluency in integrated language skills through pragmatic topics necessary for survival in target language culture. Topic-based lesson consists of model dialogues, narration, vocabulary, grammar and culture corresponding to the intermediate high level. Students will learn to speak in paragraph length conversations; write compositions related to their daily lives, and such social needs as giving suggestions, making appointments and plans, giving descriptions and excuses, asking for and giving advice for a job interview. Visual media makes learning more fun and authentic. Students are required to participate in face-to-face meetings on a regular basis with a weekly partner and the instructor.

**Prerequisites:** KOR 212 with D or better

**Linguistics**

**LING 111. CLASSROOM STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (4 Credits)**
Beginning classroom-based instruction of a language otherwise not taught at OSU. Skill areas addressed include reading, writing, speaking, listening and culture. Not for students who have previous proficiency in the target language. May be repeated for credit for different languages. For a master-apprentice approach, enroll instead in the LING 114, LING 115, LING 116 sequence. This course is repeatable for 12 credits.

**LING 112. CLASSROOM STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (4 Credits)**
Beginning classroom-based instruction of a language otherwise not taught at OSU. Skill areas addressed include reading, writing, speaking, listening and culture. Not for students who have previous proficiency in the target language. May be repeated for credit for different languages. For a master-apprentice approach, enroll instead in the LING 114, LING 115, LING 116 sequence. This course is repeatable for 12 credits.

**LING 113. CLASSROOM STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (4 Credits)**
Beginning classroom-based instruction of a language otherwise not taught at OSU. Skill areas addressed include reading, writing, speaking, listening and culture. Not for students who have previous proficiency in the target language. May be repeated for credit for different languages. For a master-apprentice approach, enroll instead in the LING 114, LING 115, LING 116 sequence. This course is repeatable for 12 credits.

**LING 114. MASTER/APPRENTICE STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (1-4 Credits)**
LING 114, LING 115, and LING 116 provides context-rich beginning language instruction, in close collaboration with a native speaker, of a language otherwise not taught at OSU. Learners work toward a level of communicative proficiency approaching the intermediate low level in each of the primary skill areas. Four credits of one language are required before moving on to the next course in the sequence. May be repeated for credit for up to three languages. Not for students who have previous proficiency in the target language. This course is repeatable for 12 credits.

**LING 115. MASTER/APPRENTICE STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (1-4 Credits)**
LING 114, LING 115, and LING 116 provides context-rich beginning language instruction, in close collaboration with a native speaker, of a language otherwise not taught at OSU. Learners work toward a level of communicative proficiency approaching the intermediate low level in each of the primary skill areas. Four credits of one language are required before moving on to the next course in the sequence. May be repeated for credit for up to three languages. Not for students who have previous proficiency in the target language. This course is repeatable for 12 credits.
LING 116. MASTER/APPRENTICE STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (1-4 Credits)
LING 114, LING 115, and LING 116 provides context-rich beginning language instruction, in close collaboration with a native speaker, of a language otherwise not taught at OSU. Learners work toward a level of communicative proficiency approaching the intermediate low level in each of the primary skill areas. Four credits of one language are required before moving on to the next course in the sequence. May be repeated for credit for up to three languages. Not for students who have previous proficiency in the target language.
This course is repeatable for 12 credits.

LING 199. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 208. *WESTERN CULTURE STUDY ABROAD. (3 Credits)
Overseas study of the history and contemporary form of important features of Western culture. Based on at least 10 weeks of studying abroad. CROSSTLISTED as ANTH 208/LING 208. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: ANTH 208

LING 209. *CULTURAL DIVERSITY STUDY ABROAD. (3 Credits)
Overseas study of non-Western cultures. Based on at least 10 weeks of studying abroad. CROSSTLISTED as ANTH 209/LING 209. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: ANTH 209

LING 251. *LANGUAGES OF OREGON. (3 Credits)
Basic lessons in languages spoken in Oregon’s minority language communities presented by native informants; discussion, language analysis, and assessment facilitated by linguistics faculty. Languages presented will vary. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: LING 251H

LING 299. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 401. RESEARCH. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 16 credits.

LING 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LING 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

LING 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LING 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LING 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 16 credits.

LING 451. GENERAL LINGUISTICS. (3 Credits)
Language systems; comparative philology, historical, descriptive, and structural linguistics; semantics; phonetics and phonemics. Not offered every year.
Recommended: 9 credits upper-division foreign language training

LING 499. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

LING 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LING 503. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

LING 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LING 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LING 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

LING 510. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

LING 545. METHODS AND MATERIALS FOR SECOND LANGUAGE ACQUISITION. (4 Credits)
Historical and contemporary approaches to teaching and assessment in the second language classroom; emphasis on evaluating second language teaching methods and materials.

LING 551. GENERAL LINGUISTICS. (3 Credits)
Language systems; comparative philology, historical, descriptive, and structural linguistics; semantics; phonetics and phonemics. Not offered every year.
Recommended: 9 credits upper-division foreign language training

LING 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Queer Studies

QS 262. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia’s and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSTLISTED as QS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 262H, WGSS 262, WGSS 262H

QS 262H. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia’s and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSTLISTED as QS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 262, WGSS 262, WGSS 262H

QS 299. SPECIAL TOPICS. (3 Credits)
This course is repeatable for 9 credits.
QS 321. *QUEER POP CULTURE. (3 Credits)
Examines the concept of Queer popular culture through film, music, TV, image, and other mediums. Seeks to disrupt dominant discourses around gender and sexuality by centralizing women of color feminisms and queer of color critiques to analyze popular representations of gender, sexuality, race, class, disability, and other social locations. CROSSLISTED as QS 321/WGSS 321. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WGSS 321

QS 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSLISTED as ES 361/QS 361/WGSS 361/WLC 361.
Equivalent to: ES 361, WGSS 361, WLC 361
Recommended: Prior filmmaking experience

QS 362. *SERVING LGBTQ+ COMMUNITIES. (3 Credits)
Engages the ethics and responsibilities involved in serving LGBTQ+ communities in fields such as education, health, law, and social services for those entering and/or continuing professions in fields that historically underserve LGBTQ+ people. Topics include LGBTQ+ youth, LGBTQ+ elders; issues affecting LGBTQ+ people across their lifespans; approaches to cultural competency; violence against LGBTQ+ people, forms of oppression including heterosexism, homophobia, and transphobia; and LGBTQ+ community resilience. CROSSLISTED as QS 362/WGSS 362. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WGSS 362

QS 364. *TRANSgendEr PoLITICs. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 364H, WGSS 364, WGSS 364H

QS 364H. *TRANSgendEr PoLITICs. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 364, WGSS 364, WGSS 364H

QS 375. *ArTS aNd SoCIal JusTIce. (4 Credits)
Explores concepts of structural inequality, difference, power, and discrimination through a critical survey of arts activism. Think critically about artwork and artists who address a number of social issues in the United States, including race, ethnicity, class, gender, sexuality, immigration, and indigeneity. CROSSLISTED as ES 375/QS 375/ WGSS 375.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 375, WGSS 375

QS 399. SPECIAL TOPICS IN QUEER STUDIES. (3 Credits)
This course is repeatable for 12 credits.

QS 409. PRACTICUM: PROJECTS IN QUEER STUDIES. (1-12 Credits)
Capstone projects bring theory into practice through research, design, and implementation of a project that synthesizes and demonstrates learning in the Queer Studies program.
This course is repeatable for 12 credits.

QS 431. *QUEER OF COLOR CRITIQUES. (4 Credits)
'Queer of color critiques' refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 431, WGSS 431

QS 432. *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/QS 532/WGSS 532. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ART 432, WGSS 432

QS 462. *QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSLISTED as QS 462/WGSS 462 and QS 562/WGSS 562. (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity
Equivalent to: WGSS 462

QS 472. *INdIGEnous TWO-SPRIT AND QUEER STUDIES. (4 Credits)
'Two-spirit' refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/WGSS 572. (Writing Intensive Course).
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ES 472, WGSS 472
Recommended: QS 262 or ES 242 or WGSS 414

QS 473. TRANSGENDER LIVES. (4 Credits)
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSLISTED as QS 473/WGSS 473 and QS 573/WGSS 573.
Equivalent to: WGSS 473
Recommended: WGSS/QS 262, WGSS/QS 364
QS 476. *TRANSNATIONAL SEXUALITIES. (4 Credits)
Explores contemporary experiences of sexualities within transnational contexts. Analyzes themes including queer and LGBTQI organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSLISTED as QS 476/WGSS 476 and QS 576/WGSS 576. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: QS 262 with D- or better
Equivalent to: WGSS 476
QS 477. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/ WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: ES 477, WGSS 477
Recommended: QS 262 and QS 462
QS 499. SPECIAL TOPICS IN QUEER STUDIES. (4 Credits)
Topics in gay, lesbian, bisexual, transgender, and queer issues and scholarship. May be repeated for credit when topic varies. This course is repeatable for 12 credits.
QS 524. TRANS/GENDER POLITICS. (4 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgenders theories, arts, and activism. CROSSLISTED as QS 524/WGSS 524.
Equivalent to: WGSS 524
QS 531. QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531.
Equivalent to: ES 531, WGSS 531
QS 532. GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/ QS 532/WGSS 532.
Equivalent to: ART 532, WGSS 532
QS 562. QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSLISTED as QS 462/WGSS 462 and QS 562/WGSS 562.
Equivalent to: WGSS 562
QS 569. TOPICS IN JOTERIA STUDIES. (3 Credits)
A space for engaging with arts, activism and scholarship emerging from queer Latin@/Chican@ experiences and consciousness is provided. Offered winter term in odd years. CROSSLISTED as ES 569/QS 569/ SPAN 569/WGSS 569.
Equivalent to: ES 569, SPAN 569, WGSS 569
This course is repeatable for 6 credits.
QS 572. INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
'Two-spirit' refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/ WGSS 572.
Equivalent to: ES 572, WGSS 572
Recommended: QS 262 or ES 242 or WGSS 414 or WGSS 514
QS 573. TRANSGENDER LIVES. (4 Credits)
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSLISTED as QS 473/WGSS 473 and QS 573/ WGSS 573.
Equivalent to: WGSS 573
Recommended: WGSS/QS 262, WGSS/QS 364
QS 576. TRANSNATIONAL SEXUALITIES. (4 Credits)
Explores contemporary experiences of sexualities within transnational contexts. Analyzes themes including queer and LGBTQI organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSLISTED as QS 476/WGSS 476 and QS 576/WGSS 576.
Equivalent to: WGSS 576
Recommended: QS 262
QS 577. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/ WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: ES 577, WGSS 577
Recommended: QS 262 and QS 462
QS 599. SPECIAL TOPICS IN QUEER STUDIES. (4 Credits)
Topics in gay, lesbian, bisexual, transgender, and queer issues and scholarship. May be repeated for credit when topic varies. This course is repeatable for 12 credits.

Russian Courses
RUS 111. FIRST-YEAR RUSSIAN. (4 Credits)
Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Designed for students with no prior training in Russian. Native and/or bilingual speakers of Russian will not receive credit for RUS 111, RUS 112, RUS 113.
RUS 112. FIRST-YEAR RUSSIAN. (4 Credits)
Prerequisites: Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Designed for students with no prior training in Russian. Native and/or bilingual speakers of Russian will not receive credit for RUS 111, RUS 112, RUS 113.
This course is repeatable for 16 credits.

RUS 113. FIRST-YEAR RUSSIAN. (4 Credits)
Prerequisites: PREREQUISITES: RUS 112 with D- or better
This course is repeatable for 16 credits.

RUS 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 299. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 329. SPECIAL TOPICS IN LANGUAGE, CULTURE, AND/OR LITERATURE. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

RUS 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

Spanish

SPAN 111. FIRST-YEAR SPANISH. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Native speakers and bilingual speakers will not receive credit for SPAN 111, SPAN 112, SPAN 113. Lec/rec.

SPAN 112. FIRST-YEAR SPANISH. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Native speakers and bilingual speakers may not receive credit for SPAN 111, SPAN 112, SPAN 113. Lec/rec.

SPAN 113. FIRST-YEAR SPANISH. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Native speakers and bilingual speakers may not receive credit for SPAN 111, SPAN 112, SPAN 113. Lec/rec.

SPAN 117. FIRST-YEAR SPANISH-COMPLETE SEQUENCE. (12 Credits)
Introduction to Spanish. Listening, speaking, reading, and writing skills developed. Students must take all twelve credits. Entire first-year sequence in eight weeks.

SPAN 188. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.

SPAN 199. SPECIAL STUDIES. (1-3 Credits)
This course is repeatable for 9 credits.

SPAN 211. SECOND-YEAR SPANISH. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers will not receive credit for SPAN 211, SPAN 212, SPAN 213.

SPAN 212. SECOND-YEAR SPANISH. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers may not receive credit for SPAN 211, SPAN 212, SPAN 213.

SPAN 213. SECOND-YEAR SPANISH. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers may not receive credit for SPAN 211, SPAN 212, SPAN 213. Completion if SPAN 213 with a grade of C- or better satisfies BA requirement for foreign languages.

SPAN 214. SECOND-YEAR SPANISH FOR NATIVE SPEAKERS. (4 Credits)
Designed for native speakers who learned Spanish in a home environment. Introduction to written Spanish.

SPAN 215. SECOND-YEAR SPANISH FOR NATIVE SPEAKERS. (4 Credits)
Designed for native speakers who learned Spanish in a home environment. Introduction to written Spanish.

SPAN 216. SECOND-YEAR SPANISH FOR NATIVE SPEAKERS. (4 Credits)
Designed for native speakers who learned Spanish in a home environment. Introduction to written Spanish. Completion of SPAN 216 with a grade of C- or better satisfies BA requirement for foreign languages.

SPAN 217. SECOND-YEAR SPANISH-COMPLETE SEQUENCE. (12 Credits)
Intermediate Spanish. Listening, speaking, reading, and writing skills developed. Students must take all 12 credits. Entire second-year sequence in eight weeks.

SPAN 221. SPANISH FOR MEDICAL PROFESSIONS I. (4 Credits)
Provides students in health science and pre-professional disciplines with a working knowledge of Spanish used in health sciences and cultural competency needed to serve Latino populations.

SPAN 222. SPANISH FOR MEDICAL PROFESSIONS II. (4 Credits)
Provides students in health science and pre-professional disciplines with a working knowledge of Spanish used in health sciences and cultural competency needed to serve Latino populations.

Equivalent to: SPAN 111, SPAN 112, SPAN 113

This course is repeatable for a maximum of 3 credits.

Recommended: SPAN 214

Recommended: SPAN 215

Recommended: SPAN 217

Recommended: SPAN 221

Recommended: SPAN 222
SPAN 236. *CONTEMPORARY LATIN AMERICAN CULTURE. (3 Credits)
Students will examine the main currents of modern Latin American culture since the beginning of the 20th century. Key subjects covered include the mural movement, 'magical realism' in postwar literature, syncretism in the region's music and religion, and environmentalism in literature and the arts. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

SPAN 237. *U.S. LATINO/A IDENTITIES AND CULTURES. (3 Credits)
An introduction to past and contemporary experiences of Latinos/as in the U.S. related to patterns of (im)migration as well as sociohistorical and political events that have shaped U.S. Latino identities. In addition, the course will explore the current social, political, economic and cultural status and experiences of Latinos/as in different regions of the United States. (Taught in English) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

SPAN 288. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language; Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters; Section 4: Topics, Hispanic society.
This course is repeatable for 12 credits.

SPAN 299. SPECIAL STUDIES. (1-3 Credits)
This course is repeatable for 9 credits.

SPAN 311. ADVANCED SPANISH GRAMMAR. (3 Credits)
Students further develop language skills acquired in earlier courses while studying more complex structural aspects of the language through the application of grammar concepts in composition and other language tasks.
Prerequisites: SPAN 213 with C- or better or placement test
Equivalent to: SPAN 314

SPAN 312. INTERMEDIATE WRITING SKILLS. (3 Credits)
Focuses on written communication in Spanish. Authentic texts are used to identify writing processes and products and see how composition is informed by cultural considerations. Special attention will be paid to the author's purpose and the distinctiveness of the target audience. Students will create original written works and reinforce oral communication skills through class discussions.
Prerequisites: SPAN 213 with C- or better or placement test
Equivalent to: SPAN 315

SPAN 313. SPANISH LANGUAGE THROUGH CULTURE. (3 Credits)
Development of Spanish language through an exploration of cultural products, perspectives and practices of Spanish-speaking communities around the world.
Equivalent to: SPAN 316
Recommended: SPAN 213

SPAN 314. THIRD-YEAR SPANISH FOR NATIVE SPEAKERS. (3 Credits)
Extensive practice in reading, writing, and speaking; refinement of spelling, grammar and vocabulary within a dynamic cultural context. Native speakers should take SPAN 314, SPAN 315, SPAN 316 instead of SPAN 311, SPAN 312, SPAN 313; credit is not allowed for both.
Equivalent to: SPAN 311
Recommended: SPAN 216

SPAN 315. THIRD-YEAR SPANISH FOR NATIVE SPEAKERS. (3 Credits)
Extensive practice in reading, writing, and speaking; refinement of spelling, grammar and vocabulary within a dynamic cultural context. Native speakers should take SPAN 314, SPAN 315, SPAN 316 instead of SPAN 311, SPAN 312, SPAN 313; credit is not allowed for both.
Equivalent to: SPAN 312
Recommended: SPAN 314

SPAN 316. THIRD-YEAR SPANISH FOR NATIVE SPEAKERS. (3 Credits)
Extensive practice in reading, writing, and speaking; refinement of spelling, grammar and vocabulary within a dynamic cultural context. Native speakers should take SPAN 314, SPAN 315, SPAN 316 instead of SPAN 311, SPAN 312, SPAN 313; credit is not allowed for both.
Equivalent to: SPAN 313
Recommended: SPAN 315

SPAN 317. DIRECTED READING AND WRITING IN SPANISH. (3 Credits)
Emphasis on reading comprehension and improving writing ability. Students will build on their language skills and cultural awareness using different forms of literary expression from the Spanish-speaking world.
Equivalent to: SPAN 327
Recommended: 9 credits of upper-division Spanish

SPAN 318. INTRODUCTION TO SPANISH LANGUAGE LITERATURE. (3 Credits)
Provides the literary background and analytical tools for students to discuss Spanish language literature with some depth and prepares students for more advanced literature courses. Some discussion of Latin American and Spanish history, politics and culture will provide a context for the readings.
Recommended: 9 credits of upper-division Spanish

SPAN 319. SPANISH FOR BUSINESS. (3 Credits)
Recommended: SPAN 312

SPAN 320. SPANISH CONVERSATION. (3 Credits)
Extensive listening and speaking practice in Spanish, and systematic contact with Latin culture. Emphasis on vocabulary, pronunciation, intonation, and comprehension. Native speakers of Spanish are not eligible to take this course. May be used to satisfy requirements for the major or minor.
Recommended: 6 credits of upper-division Spanish

SPAN 327. MEXICAN-AMERICAN LITERATURE AND COMPREHENSION FOR SPANISH HERITAGE LANGUAGE LEARNERS. (3 Credits)
Combines the study of fiction, drama, and poetry in Spanish language produced by people of Mexican origin in what is today the United States, with intensive practice in the writing of formal Spanish. Students are encouraged to develop their independent thinking and analytical ability. Designed for students from a Spanish-speaking background.
Equivalent to: SPAN 317
Recommended: SPAN 316

SPAN 331. *THE CULTURES OF SPAIN AND PORTUGAL. (3 Credits)
Historical development of the cultures and societies of the Iberian Peninsula. Taught in Spanish. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.
SPAN 332. **THE CULTURES OF SPAIN AND PORTUGAL.** (3 Credits)
Historical development of the cultures and societies of the Iberian Peninsula. Taught in Spanish. (H) (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Recommended:** Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 333. **CULTURES OF SPAIN AND PORTUGAL.** (3 Credits)
Historical development of the cultures and societies of today's Iberian Peninsula. Taught in Spanish.
**Recommended:** Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 336. **LATIN AMERICAN CULTURE.** (3 Credits)
Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. (H) (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Recommended:** Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 337. **LATIN AMERICAN CULTURE.** (3 Credits)
Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. (H) (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Recommended:** Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 338. **LATIN AMERICAN CULTURE.** (3 Credits)
Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. (H) (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Recommended:** Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 339. **MEXICAN IMMIGRANT EXPERIENCE IN THE UNITED STATES.** (3 Credits)
An interdisciplinary analysis of the immigration from Mexico to the United States. It will include discussions of literary, cultural and political accounts. Emphasis on the development of presentational communication skills in Spanish. Taught in Spanish.
**Recommended:** 12 credits from SPAN 314, SPAN 315, SPAN 316, SPAN 317, SPAN 318, SPAN 331, SPAN 332, SPAN 336, SPAN 337, SPAN 338.

SPAN 344. **SELECTED TOPICS IN LITERATURE.** (3 Credits)
Taught in Spanish. May be repeated for credit when topic varies.
**This course is repeatable for 9 credits.**
**Recommended:** Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 350. **PHONETICS AND PRONUNCIATION.** (3 Credits)
An exploration of the organs of speech and hearing, acoustic analysis, and transcription of native and learner Spanish speech samples.
**Recommended:** 3 credits of upper-division Spanish.

SPAN 351. **HISPANIC LINGUISTICS.** (3 Credits)
**Recommended:** SPAN 350

SPAN 379. **PROCTOR EXPERIENCE.** (1 Credit)
Supervised practicum for advanced students, with assignments as proctors or tutors in lower-division Spanish language courses. No more than 2 credits may be used to satisfy degree requirements for a major in Spanish; no credit may be used to satisfy requirements for a minor in Spanish. Graded P/N.
**This course is repeatable for 3 credits.**
**Recommended:** Completion of 21 upper-division credits in Spanish with a minimum 3.00 GPA.

SPAN 388. **HISPANIC STUDIES, HISPANIC STUDY CENTERS.** (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises). Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.
**This course is repeatable for 12 credits.**

SPAN 399. **SPECIAL TOPICS.** (1-16 Credits)
**This course is repeatable for 16 credits.**

SPAN 407. **SEMINAR.** (1-16 Credits)
**This course is repeatable for 16 credits.**

SPAN 403. **THESIS.** (1-16 Credits)
**This course is repeatable for 16 credits.**

SPAN 405. **READING AND CONFERENCE.** (1-16 Credits)
**This course is repeatable for 16 credits.**

SPAN 408. **INTERNSHIP.** (1-15 Credits)
**This course is repeatable for 15 credits.**

SPAN 409. **SPECIALIZED GRAMMAR OR LINGUISTICS TOPICS.** (3 Credits)
Students develop an in-depth knowledge of various linguistic aspects of Spanish, particularly in regard to problematic grammatical structures and the development of writing proficiency. The main focus is on integrating a thorough understanding of grammatical structures into writing using selected literary works as models. Students analyze their own linguistic progress and apply this meta-knowledge to their writing.
**Recommended:** 18 credits of upper-division Spanish.

SPAN 410. **RESEARCH.** (1-16 Credits)
**This course is repeatable for 16 credits.**

SPAN 412. **ADVANCED COMPOSITION.** (3 Credits)
Emphasis on creative writing. Students will read and discuss a series of stories with the same theme, then write their own. The subjunctive and other advanced grammar topics will be reviewed and incorporated into the writing activities. Taught in Spanish.
**Recommended:** 18 credits of upper-division Spanish

SPAN 413. **ADVANCED COMMUNICATION SKILLS.** (3 Credits)
Contextualized exploration of skills outlined in the National Standards Project's.
**Recommended:** 18 credits of upper-division Spanish
SPAN 435. SPECIAL TOPICS IN LATIN AMERICAN CULTURE. (3 Credits)
Historical and contemporary aspects of the cultures of Latin America. May include material relevant to Spain and U.S. Latinos. May be repeated for credit when topic varies.
This course is repeatable for 9 credits.
Recommended: 18 credits of upper-division Spanish

SPAN 438. *SELECTED TOPICS IN LUSO-HISPANIC CULTURE. (3 Credits)
Contemporary aspects of the cultures of Spain, Portugal, or Latin America with a cross-cultural perspective. Topics and language of instruction vary. May be repeated for credit when topic varies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 9 credits.
Recommended: Completion of 6 credits from SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338.

SPAN 439. TOPICS IN MEXICAN CULTURE AS EVIDENCED THROUGH MEXICAN FILM. (3 Credits)
Critical analysis and evaluation of films as cultural texts that open up a window into Mexican society. Movies with strong sexual content, explicit violence, language, and/or drug use will be viewed in the class. Taught in Spanish with some readings in English. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.
Recommended: Completion of 12 credits from SPAN 316, SPAN 317, SPAN 318, SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338, SPAN 339, SPAN 411, SPAN 412, SPAN 413 with a minimum grade of B-

SPAN 441. CONTEMPORARY SHORT STORY. (3 Credits)
An exploration and comparison of the short story in its various manifestations across the Spanish-speaking world in the 20th and 21st centuries. Themes such as identity, discrimination, class conflict, language, power, resistance, and marginalization will be analyzed within the socio-historical contexts in which the literary works were created.
Recommended: At least 12 credits of upper-division Spanish.

SPAN 444. SELECTED TOPICS IN THE LITERATURE OF SPAIN. (3 Credits)
Representative Spanish prose, poetry, and drama, with an emphasis on the 19th and 20th centuries. Taught in Spanish. See Schedule of Classes for current term offering. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 12 credits.
Recommended: Completion of 21 upper-division credits in Spanish.

SPAN 445. SELECTED TOPICS IN THE LITERATURE OF LATIN AMERICA. (3 Credits)
Representative prose, poetry, and drama of Spanish America and/or Brazil, with an emphasis on the mid-19th century to the present. Topics and language of instruction may vary. See Schedule of Classes for current term offering. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 18 credits.
Recommended: Completion of 21 upper-division credits in Spanish.

SPAN 446. RECENT LATIN AMERICAN LITERATURE. (3 Credits)
Recent fiction that goes beyond Magical Realism. Discussion includes literary techniques, as well as Latin American history, politics and cultural values. Taught in Spanish.
Recommended: Completion of 21 upper-division credits of Spanish.

SPAN 447. MEXICAN WOMEN WRITERS. (3 Credits)
Fiction by contemporary Mexican women, emphasizing how the writing reflects the authors’ lives, as well as Mexican history, politics and cultural values. Taught in Spanish.
Recommended: Completion of 21 upper-division credits of Spanish.

SPAN 448. LATIN AMERICAN GREAT WORKS. (3 Credits)
Major works by Latin American writers, concentrating on literary style and technique, as well as Latin American history, politics and culture. Taught in Spanish.
Recommended: Completion of 21 upper-division credits of Spanish.

SPAN 453. SPANISH SOCIOLINGUISTICS. (3 Credits)
Provides a foundation of sociolinguistic theory from which various topics can be analyzed, discussed and applied to language situations that are specific to Spanish. These include language contact, Spanish varieties, language policy, and language attitudes. All topics are presented within the context of speech communities and the external and internal variables that affect these communities.
Prerequisites: SPAN 350 with C- or better

SPAN 455. INTRODUCTION TO SPANISH TRANSLATION. (3 Credits)
Combines beginning translation theory with hands-on practice using a variety of activities from several areas of professional specialization. Includes a brief introduction to simultaneous interpretation as it is done in professional conference or broadcast media settings. Participants must be highly proficient in both English and Spanish.
Recommended: 12 credits of upper-division Spanish.

SPAN 456. SPANISH IN THE UNITED STATES. (3 Credits)
Provides a foundation for the study of Spanish in the United States. Focuses on the diverse identities of Latino/as and Spanish speakers as they define what it means to be bilingual locally, regionally, and nationally. Spanish and Spanish-English bilingualism will be studied from critical sociolinguistic, historical and political perspectives.
Prerequisites: SPAN 350 with C- or better

SPAN 462. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
Recommended: SPAN 461

SPAN 470. *ADVANCED SPANISH COORDINATED STUDIES. (1-30 Credits)
Interdisciplinary examination of a topic related to points of contact between Spanish- and English-speaking populations in Oregon and beyond. Includes the study of literature, culture, language skills, and a service-learning component. Constitutes a full-time course load. Taught in Spanish. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
This course is repeatable for 30 credits.

SPAN 488. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises). Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.
This course is repeatable for 12 credits.

SPAN 499. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 99 credits.

SPAN 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
### SPAN 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

### SPAN 506. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

### SPAN 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

### SPAN 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

### SPAN 510. INTERNSHIP. (1-15 Credits)
(See SPAN 410 for description.)
This course is repeatable for 15 credits.

### SPAN 511. SPECIALIZED GRAMMAR OR LINGUISTICS TOPICS. (3 Credits)
Students develop an in-depth knowledge of various linguistic aspects of Spanish, particularly in regard to problematic grammatical structures and the development of writing proficiency. The main focus is on integrating a thorough understanding of grammatical structures into writing using selected literary works as models. Students analyze their own linguistic progress and apply this meta-knowledge to their writing.
**Recommended:** 18 credits of upper-division Spanish.

### SPAN 512. ADVANCED COMPOSITION. (3 Credits)
Emphasis on creative writing. Students will read and discuss a series of stories with the same theme, then write their own. The subjunctive and other advanced grammar topics will be reviewed and incorporated into the writing activities. Taught in Spanish.
**Recommended:** 18 credits of upper-division Spanish

### SPAN 513. ADVANCED COMMUNICATION SKILLS. (3 Credits)
Contextualized exploration of skills outlined in the National Standards Project’s.
**Recommended:** 18 credits of upper-division Spanish

### SPAN 535. SPECIAL TOPICS IN LATIN AMERICAN CULTURE. (3 Credits)
Historical and contemporary aspects of the cultures of Latin America. May include material relevant to Spain and U.S. Latinos. May be repeated for credit when topic varies.
**This course is repeatable for 9 credits.**
**Recommended:** 18 credits of upper-division Spanish

### SPAN 538. SELECTED TOPICS IN LUSO-HISPANIC CULTURE. (3 Credits)
Contemporary aspects of the cultures of Spain, Portugal, or Latin America with a cross-cultural perspective. Topics and language of instruction vary. Not offered every year. May be repeated for credit when topic varies.
**This course is repeatable for 9 credits.**
**Recommended:** Completion of 6 credits from SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338.

### SPAN 544. SELECTED TOPICS IN THE LITERATURE OF SPAIN. (3 Credits)
Representative Spanish prose, poetry, and drama, with an emphasis on the 19th and 20th centuries. Taught in Spanish. Not offered every year. May be repeated for credit when topic varies.
**This course is repeatable for 12 credits.**
**Recommended:** Completion of 21 upper-division credits in Spanish.

### SPAN 545. SELECTED TOPICS IN THE LITERATURE OF LATIN AMERICA. (3 Credits)
Representative prose, poetry, and drama of Spanish America and/or Brazil, with an emphasis on the mid-19th century to the present. Topics and language of instruction may vary. Not offered every year. May be repeated for credit when topic varies.
**This course is repeatable for 18 credits.**
**Recommended:** Completion of 21 upper-division credits in Spanish.

### SPAN 546. RECENT LATIN AMERICAN LITERATURE. (3 Credits)
Recent fiction that goes beyond Magical Realism. Discussion includes literary techniques, as well as Latin American history, politics and cultural values. Taught in Spanish.
**Recommended:** Completion of 21 upper-division credits in Spanish.

### SPAN 547. MEXICAN WOMEN WRITERS. (3 Credits)
Fiction by contemporary Mexican women, emphasizing how the writing reflects the authors’ lives, as well as Mexican history, politics and cultural values. Taught in Spanish.
**Recommended:** 21 upper-division credits of Spanish.

### SPAN 548. LATIN AMERICAN GREAT WORKS. (3 Credits)
Major works by Latin American writers, concentrating on literary style and technique, as well as Latin American history, politics and culture. Taught in Spanish.
**Recommended:** 21 upper-division credits of Spanish.

### SPAN 552. INTRODUCTION TO SPANISH SOCIOLINGUISTICS. (3 Credits)
Provides a foundation of sociolinguistic theory in order to analyze, discuss and apply the theory to Spanish language situations, such as language contact, Spanish varieties, language politics, and language attitudes; all within the context of a speech community and the external and internal variables that affect it.

### SPAN 553. SPANISH SOCIOLINGUISTICS. (3 Credits)
Provides a foundation of sociolinguistic theory from which various topics can be analyzed, discussed and applied to language situations that are specific to Spanish. These include language contact, Spanish varieties, language policy, and language attitudes. All topics are presented within the context of speech communities and the external and internal variables that affect these communities.

### SPAN 555. INTRODUCTION TO SPANISH TRANSLATION. (3 Credits)
Combines beginning translation theory with hands-on practice using a variety of activities from several areas of professional specialization. Includes a brief introduction to simultaneous interpretation as it is done in professional conference or broadcast media settings. Participants must be highly proficient in both English and Spanish.
**Recommended:** 12 credits of upper-division Spanish.

### SPAN 556. SPANISH IN THE UNITED STATES. (3 Credits)
Provides a foundation for the study of Spanish in the United States. Focuses on the diverse identities of Latino/as and Spanish speakers as they define what it means to be bilingual locally, regionally, and nationally. Spanish and Spanish-English bilingualism will be studied from critical sociolinguistic, historical and political perspectives.
**Recommended:** SPAN 350

### SPAN 561. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
**Recommended:** SPAN 413

### SPAN 562. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
**Recommended:** SPAN 561
SPAN 563. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
Recommended: SPAN 562

SPAN 569. TOPICS IN JOTERIA STUDIES. (3 Credits)
A space for engaging with arts, activism and scholarship emerging from queer Latin@/Chicana/o experiences and consciousness is provided. Offered winter term in odd years. CROSSLISTED as ES 569/QS 569/
SPAN 569/WGSS 569.
Equivalent to: ES 569, QS 569, WGSS 569
This course is repeatable for 6 credits.

SPAN 570. GRADUATE SPANISH COORDINATED STUDIES. (1-15 Credits)
An intensive, team-taught course in which learners engage in advanced exploration of issues of importance to Spanish-speaking communities in Oregon and facilitate the learning of undergraduate native speaker and second language students. Topics change regularly. The course addresses all communicative areas (reading, writing, speaking and listening) and includes content in the areas of literature, linguistics, culture, civic engagement, and service-learning. Successful completion of the full 15 credits with a grade of B or higher meets requirements for the graduate minor in Contemporary Hispanic Studies.
Equivalent to: SPAN 510, SPAN 538, SPAN 545, SPAN 546, SPAN 562, SPAN 563
This course is repeatable for 30 credits.
Recommended: SPAN 599

SPAN 588. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises). Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.

SPAN 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

SPAN 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Women, Gender, and Sexuality Studies

WGSS 110. *GENDER, RACE, AND POP CULTURE. (3 Credits)
Introduces students to the critical analysis of mass media and representations of women, gender, sexuality, and race in popular culture. Topics vary from term to term and may include the entertainment industry, advertising, music, literature, the internet and technology. May be repeated for credit when topic varies. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
This course is repeatable for 9 credits.

WGSS 111. *FEMINIST PERSPECTIVES ON CURRENT EVENTS. (3 Credits)
Introduction to feminist analysis through the examination of current events and their relation to gender, sexuality, race, ethnicity, nationality, religion, class, age, and ability. Topics vary from term to term and may include issues related to politics, social movements, education, the workplace, science and technology, the environment, globalization, arts and culture, and the media. May be repeated for credit when topic varies. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
This course is repeatable for 9 credits.

WGSS 199. SPECIAL STUDIES. (1-3 Credits)
Special topics of contemporary relevance to research of women and gender role issues. For students who seek an elementary introduction to a specific realm of women, gender, and sexuality studies. May be repeated for credit when topic varies.
Equivalent to: WS 199
This course is repeatable for 9 credits.

WGSS 223. *INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES. (3 Credits)
Multidisciplinary introduction to women, gender, and sexuality studies. Focuses on the lives and status of women in society and explores ways institutions such as family, work, media, law and religion affect different groups of women. Explores issues of gender, race, class, age, sexual orientation, size and ability. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WGSS 223H, WS 223, WS 223H

WGSS 223H. *INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES. (3 Credits)
Multidisciplinary introduction to women, gender, and sexuality studies. Focuses on the lives and status of women in society and explores ways institutions such as family, work, media, law and religion affect different groups of women. Explores issues of gender, race, class, age, sexual orientation, size and ability. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: WGSS 223, WS 223, WS 223H

WGSS 224. *WOMEN: PERSONAL AND SOCIAL CHANGE. (3 Credits)
Examines the way the questioning of traditional gender roles and their accompanying power structures can lead to change in women's personal and public lives. Explores women's heritage and contributions and focuses on issues of self-growth and social movements for change. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: WS 224

WGSS 230. *WOMEN IN THE MOVIES. (3 Credits)
Examines ways women are depicted in the movies and how those depictions are created by and create larger social constructions of women. Special attention is given to the intersections of race, class, sexual identity, and age with gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: WGSS 230H, WS 230

WGSS 230H. *WOMEN IN THE MOVIES. (3 Credits)
Examines ways women are depicted in the movies and how those depictions are created by and create larger social constructions of women. Special attention is given to the intersections of race, class, sexual identity, and age with gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WGSS 230

WGSS 235. *WOMEN IN WORLD CINEMA. (3 Credits)
Explores constructions and practices of gender in a transnational, multi-religious, and global framework by examining a wide variety of films about women around the world. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: WGSS 235H, WS 235
WGSS 235H. *WOMEN IN WORLD CINEMA. (3 Credits)
Explores constructions and practices of gender in a transnational, multi-religious, and global framework by examining a wide variety of films about women around the world. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: WGSS 235, WS 235, WS 235H

WGSS 240. *GENDER AND SPORT. (3 Credits)
Focuses on sport as a gendered institution. Drawing from cultural, psychosocial, and political perspectives, the course examines intersections of gender with age, sexual orientation, social class, gender identity, race and ethnicity and politics. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WGSS 240H, WS 240

WGSS 240H. *GENDER AND SPORT. (3 Credits)
Focuses on sport as a gendered institution. Drawing from cultural, psychosocial, and political perspectives, the course examines intersections of gender with age, sexual orientation, social class, gender identity, race and ethnicity and politics. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: WGSS 240

WGSS 262. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia's and transphobia's relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as QS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 262, QS 262H, WGSS 262H

WGSS 262H. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia's and transphobia's relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as QS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 262, QS 262H, WGSS 262

WGSS 270. *RESISTING GENDER VIOLENCE. (3 Credits)
Addresses issues of domestic violence, rape, dating violence, as well as contemporary social debates about pornography and the media’s impact on violence in society, which includes a global perspective. Course focuses on individual and collective practices resisting gender violence. (Bacc Core Course) (SS)
Attributes: CPDP – Core, Perspective, Difference/Pow er/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 270

WGSS 280. *WOMEN WORLDWIDE. (3 Credits)
Focuses on women's experiences throughout the world and examines women's issues and status cross-culturally. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity
Equivalent to: WGSS 280H, WS 280

WGSS 280H. *WOMEN WORLDWIDE. (3 Credits)
Focuses on women's experiences throughout the world and examines women's issues and status cross-culturally. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: WGSS 280, WS 280, WS 280H

WGSS 295. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENG 295, ENG 295H, PHL 295, PHL 295H, WGSS 295H

WGSS 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, PHL 295H, WGSS 295

WGSS 299. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics related to women, gender and sexuality. Description and analysis of different realms of knowledge about gender issues.
Equivalent to: WS 299
This course is repeatable for 12 credits.

WGSS 311. *GLOBAL EXPERIENCE: CULTURAL DIVERSITY. (3 Credits)
Engagement in a study abroad experience outside Western Europe with an emphasis on transnational, queer, and critical race feminist analysis (minimum of 7days). (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
This course is repeatable for 12 credits.

WGSS 312. *GLOBAL EXPERIENCE: WESTERN CULTURE. (3 Credits)
Engagement in a study abroad experience in Western Europe with an emphasis on transnational, queer, and critical race feminist analysis (minimum of 7days). (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
This course is repeatable for 12 credits.

WGSS 313. *GLOB EXP: CONTEMP GLOB ISSU. (3 Credits)
Engagement in a study abroad experience with an emphasis on transnational, queer, and critical race feminist analysis of critical global issues (minimum of 7days).
Attributes: CSGI – Core, Synth, Global Issues
This course is repeatable for 12 credits.

WGSS 319. *Feminist Decolonizing Methodologies: Social Justice Research. (3 Credits)
Examines traditional scientific methods through a feminist philosophy of science lens that incorporates critiques of the racialized and gendered origins of modern science. Second, it introduces the breadth of feminist research methods associated with social justice research.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: WGSS 223 with D- or better or WGSS 223H with D- or better
WGSS 320. *GENDER AND TECHNOLOGY. (3 Credits)
Explores women's contributions and focuses in technology fields.
Analyzes gendered nature of technology. Theory and practice of technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: WS 320

WGSS 321. *QUEER POP CULTURE. (3 Credits)
Examines the concept of Queer popular culture through film, music, TV, image, and other mediums. Seeks to disrupt dominant discourses around gender and sexuality by centralizing women of color feminisms and queer of color critiques to analyze popular representations of gender, sexuality, race, class, disability, and other social locations. CROSSTLISTED as QS 321/WGSS 321. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: QS 321

WGSS 324. *FEMINIST ACTIVISMS. (3 Credits)
Addresses the breadth of feminist social justice activism through a focus on collective movements for social change as well as individual and community resistance. In exploring relationships between feminist theories and practice, students are encouraged to vision and practice a variety of feminist activisms. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WGSS 325H, WS 325

WGSS 325. *DISNEY: GENDER, RACE, EMPIRE. (3 Credits)
Explores constructions of gender, race, class, sexuality, and nation in the animated films of Walt Disney; introduces concepts in film theory and criticism, and develops analyses of the politics of representation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: WGSS 325

WGSS 325H. *DISNEY: GENDER, RACE, EMPIRE. (3 Credits)
Explores constructions of gender, race, class, sexuality, and nation in the animated films of Walt Disney; introduces concepts in film theory and criticism, and develops analyses of the politics of representation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: WS 325

WGSS 340. *GENDER AND SCIENCE. (3 Credits)
Analyzes the relationship between society and science by explaining technology and science as gendered practices and bodies of knowledge. Focuses on the ways the making of women and men affect the making of science and explores the roles of women in scientific pursuits. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACS – Liberal Arts Social Core
Equivalent to: WS 340

WGSS 340H. *GENDER AND SCIENCE. (3 Credits)
Analyzes the relationship between society and science by explaining technology and science as gendered practices and bodies of knowledge. Focuses on the ways the making of women and men affect the making of science and explores the roles of women in scientific pursuits. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: WGSS 340

WGSS 350. *POLITICS OF MOTHERHOOD IN A GLOBAL CONTEXT. (3 Credits)
Introduces students to the politics of motherhood in global contexts, focusing on politics of transnational adoption; motherhood, surrogacy, and biotechnologies; effects of globalization on mothering across borders; mothering in the global welfare state; movements for reproductive justice; and transnational representations of motherhood. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WS 350

WGSS 360. *MEN AND MASCULINITIES IN A GLOBAL CONTEXT. (3 Credits)
Students will become familiar with central topics in global masculinity studies, analyze texts in diverse media, develop original arguments, and engage with issues of masculinity and representation through written and creative work. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WS 360

WGSS 360H. *MEN AND MASCULINITIES. (3 Credits)
Students will become familiar with central topics in global masculinity studies, analyze texts in diverse media, develop original arguments, and engage with issues of masculinity and representation through written and creative work. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WS 360

WGSS 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSTLISTED as ES 361/QS 361/WGSS 361/WLC 361.
Equivalent to: ES 361, QS 361, WLC 361
Recommended: Prior filmmaking experience

WGSS 362. *SERVING LGBTQ+ COMMUNITIES. (3 Credits)
Engages the ethics and responsibilities involved in serving LGBTQ+ communities in fields such as education, health, law, and social services for those entering and/or continuing professions in fields that historically underserve LGBTQ+ people. Topics include LGBTQ+ youth; LGBTQ+ elders; issues affecting LGBTQ+ people across their lifespans; approaches to cultural competency; violence against LGBTQ+ people, forms of oppression including heterosexism, homophobia, and transphobia; and LGBTQ+ community resilience. CROSSTLISTED as QS 362/WGSS 362. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: QS 362

WGSS 364. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSTLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 364, QS 364H, WGSS 364H
WGSS 364H. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
* Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 364, QS 364H, WGSS 364

WGSS 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ANTH 373, ES 373, WLC 373

WGSS 375. *ARTS AND SOCIAL JUSTICE. (4 Credits)
Explores concepts of structural inequality, difference, power, and discrimination through a critical survey of arts activism. Think critically about artwork and artists who address a number of social issues in the United States, including race, ethnicity, class, gender, sexuality, immigration, and indigeneity. CROSSLISTED as ES 375/WS 375/WGSS 375.
* Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 375, QS 375

WGSS 378. *RELIGION AND GENDER: A GLOBAL PERSPECTIVE. (4 Credits)
Introduces students to the academic study of religion, as well as the academic study of gender. In order to offer a global perspective, we will read a series of case studies that deal with the religion as a gendered experience. Students will produce two essays, one of which will be based on independent research. CROSSLISTED as HST 378/REL 378/WGSS 378. (Bacc Core Course)
* Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: HST 378, REL 378

WGSS 380. *MUSLIM WOMEN. (3 Credits)
Examines the lives and experiences of Muslim women in Islamic communities around the world from a variety of perspectives in order to highlight issues significant for contemporary Muslim women: family, education, work, politics, health, marriage, divorce, war, and violence. (Bacc Core Course)
* Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HST 378, REL 378

WGSS 399. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics in women, gender, and sexuality. May be repeated for credit when topic varies.
Equivalent to: WGSS 399H, WS 399
* This course is repeatable for 12 credits.

WGSS 399H. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics in women, gender, and sexuality. May be repeated for credit when topic varies.
* Attributes: HNRS – Honors Course Designator
Equivalent to: WGSS 399, WS 399, WS 399H
* This course is repeatable for 12 credits.

WGSS 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: WS 402
* This course is repeatable for 16 credits.

WGSS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WGSS 407. SEMINAR. (3 Credits)
Equivalent to: WS 407
* This course is repeatable for 99 credits.

WGSS 409. PRACTICUM. (1-12 Credits)
This course is repeatable for 12 credits.

WGSS 410. INTERNSHIP. (1-16 Credits)
The internship experience provides the opportunity to gain experience within an off-campus private, public, or community agency or organization which has as one of its goals the improvement of the status of women in society. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the WGSS program. Only 6 credits will count toward the Women, Gender, and Sexuality Studies major.
Equivalent to: WS 410
* This course is repeatable for 16 credits.

WGSS 414. *SYSTEMS OF OPPRESSION IN WOMEN'S LIVES. (4 Credits)
Explores the ways different systems of oppression and discrimination impact women's lives. Examines sexism, classism, racism, and anti-Jewish oppression, as well as discrimination against queer women, older women, and those who differ in ability and appearance. (SS) (Bacc Core Course)
* Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Prerequisites: WS 223 with D- or better or WGSS 223H with D- or better
Equivalent to: WS 414H

WGSS 416. THEORIES OF FEMINISM. (4 Credits)
Explores feminist conceptions about the nature of the world, women's reality and visions for change. Analyzes major issues raised by the women's movement and the development of feminist ideas, as well as provides a critical examination of feminist thought and different theories which comprise it.
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WGSS 223 with D- or better or WGSS 223H with D- or better or WS 224 with D- or better
Equivalent to: WS 416

WGSS 417. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class, with in-depth consideration of selected social issues such as rape and pornography. CROSSLISTED as PHL 417/WGSS 417 and PHL 517/WGSS 517.
Equivalent to: PHL 417, WS 417

WGSS 418. FEMINIST RESEARCH METHODS. (4 Credits)
Introduces feminist research methods associated with research design, analysis, and interpretation. It utilizes feminist social justice frameworks and focuses on in-depth interviewing and focus groups, oral histories, ethnography, and visual and textual analysis, as well as survey design and community-based participatory research.
Prerequisites: WS 414 with C- or better

WGSS 430. WOMEN OF COLOR FEMINISMS. (4 Credits)
Explores the contemporary experiences of women of color, as well as the theoretical and practical frameworks of women of color feminisms. Analyses key themes in women of color feminisms, including politics of representation, multiple forms of state and interpersonal violence, intersecting forms of oppression, economic justice, reproductive justice, and strategies of resistance.
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WGSS 223 with D- or better or WGSS 223H with D- or better
Equivalent to: WS 430

WGSS 431. QUEER OF COLOR CRITIQUES. (4 Credits)
†Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSTLISTED as ES 431/WS 431/WGSS 431 and ES 531/WS 531/WGSS 531. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 431, WS 431

WGSS 432. *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections of Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSTLISTED as ART 432/WS 432/WGSS 432 and ART 532/WS 532/WGSS 532. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ART 432, WS 432

WGSS 440. *WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women’s use and control of natural resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: WGSS 440H, WS 440

WGSS 440H. *WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women’s use and control of natural resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: WGSS 440

WGSS 450. ECOFEMINISM. (3 Credits)
Focuses on the ecological and feminist principles that mediate humanity’s relationship with nature.
Equivalent to: WS 450

WGSS 460. *SEXUALITIES, FEMINISMS, WOMEN. (4 Credits)
Explores the historical, theoretical, and political dimensions of female sexuality. The course also examines the basic assumptions about the meaning of gendered sexuality, how it has been shaped and controlled, and why women’s sexuality has been/is a source of both women’s liberation and subjugation. In addition, the course incorporates Queer and Trans* theories about gendered/women’s sexualities. (SS) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACS – Liberal Arts Social Core
Prerequisites: WGSS 223 with D- or better or WS 223H with D- or better or WGSS 224 with D- or better
Equivalent to: WS 460

WGSS 462. *QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSTLISTED as WS 462/WGSS 462 and WS 562/WGSS 562. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: WS 462, WS 462

WGSS 463. *GLOBAL SEX WORK AND TRAFFICKING. (3 Credits)
Examination of sex work and trafficking, cross culturally drawing upon case studies from Africa, Asia, the Americas, and Europe. It explores legal and regulatory debates, diversity of sex work-related experiences, and sex work-related social activism to uncover the gendered intersections of power and privilege from a global perspective. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: WGSS 223 with D- or better or WS 223 with D- or better or WGSS 224 with D- or better or WS 224 with D- or better

WGSS 465. WOMEN, WEIGHT, AND BODY IMAGE. (4 Credits)
Focuses on women's increasing struggles with weight, eating disorders, and broader body image issues in contemporary society. Explores how social institutions such as media, medicine, government contribute to weight bias and unhealthy standards for appearance. Examines weightism as a system of oppression that intersects with other systems of oppression including sexism, racism, classism, heterosexism, ableism, and ageism. CROSSTLISTED as PSY 465/WGSS 465 and PSY 565.
Equivalent to: PSY 462, PSY 465
WGSS 466. *FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employs a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WGSS 240 with D- or better or WGSS 262 with D- or better or WGSS 262H with D- or better or WGSS 270 with D- or better or WGSS 280 with D- or better or WGSS 280H with D- or better or WGSS 321 with D- or better or WGSS 325 with D- or better or WGSS 325H with D- or better or WGSS 340 with D- or better or WGSS 340H with D- or better or WGSS 350 with D- or better or WGSS 360 with D- or better or WGSS 360H with D- or better or WGSS 364 with D- or better or WGSS 364H with D- or better or WGSS 373 with D- or better or WGSS 375 with D- or better or WGSS 380 with D- or better or WGSS 380H with D- or better
Equivalent to: PSY 466, WS 466

WGSS 472. *INDIGENOUS TWO SPIRIT AND QUEER STUDIES. (4 Credits)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ES 472, QS 472
Recommended: WS 223 or ES 242 or WGSS 414

WGSS 473. TRANSGENDER LIVES. (4 Credits)
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSLISTED as QS 473/WGSS 473 and QS 573/WGSS 573.
Equivalent to: QS 473
Recommended: WGSS/QS 262, WGSS/QS 364

WGSS 476. *TRANSNATIONAL SEXUALITIES. (4 Credits)
Explores contemporary experiences of sexualities within transnational contexts. Analyzes themes including queer and LGBTQI organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSLISTED as QS 476/WGSS 476 and QS 576/WGSS 576. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: QS 262 with D- or better
Equivalent to: QS 476

WGSS 477. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/ WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: ES 477, QS 477
Recommended: QS 262 and QS 464

WGSS 480. *GENDER AND TRANSNATIONAL ACTIVISMS. (3 Credits)
Focuses on social constructions of gender in global context. It explores the comparative realities of various gendered struggles for social justice and studies key definitions and theoretical assumptions relevant to the subject of global feminist activism. (NC) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Prerequisites: WS 223 with D- or better or WGSS 223H with D- or better or WS 224 with D- or better or WGSS 223 with D- or better or WGSS 224 with D- or better
Equivalent to: WS 480

WGSS 480H. *GENDER AND TRANSNATIONAL ACTIVISMS. (3 Credits)
Focuses on social constructions of gender in global context. It explores the comparative realities of various gendered struggles for social justice and studies key definitions and theoretical assumptions relevant to the subject of global feminist activism. (NC) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WGSS 223 with D- or better or WS 224 with D- or better or WGSS 223H with D- or better or WS 224 with D- or better
Equivalent to: WS 480

WGSS 482. GLOBAL PERSPECTIVES ON WOMEN’S HEALTH. (4 Credits)
Women’s health issues are examined from a global perspective in the context of a woman’s life and through a feminist political lens. Central to our discussions will be an analysis of the interplay among race, class, and gender in shaping particular health care outcomes. The course stresses the potential for women’s agency and autonomy with respect to improving their health and environments.
Equivalent to: WS 482

WGSS 483. RACE, GENDER, AND HEALTH JUSTICE. (4 Credits)
Based on a social justice framework, this course explores the intersections of race, gender, ethnicity, disability and sexuality to provide a deeper understanding of how these factors shape health inequities in diverse communities nationally and globally.

WGSS 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D-] or ES 410 [D-] or WGSS 410 [D-] or WLC 410 [D-])
Equivalent to: ANTH 485, ES 485, WLC 485
This course is repeatable for 4 credits.
WGSS 486. GLOBAL EXPERIENCE I. (1 Credit)
Prepares students to participate in a short-term study abroad experience that emphasizes volunteer experiences in women's organizations and analysis from transnational feminist perspectives.
Equivalent to: WS 486

WGSS 487. GLOBAL EXPERIENCE II. (1 Credit)
Engages students in a short-term study abroad experience that emphasizes volunteer experiences in women's organizations and analysis from transnational feminist perspectives.
Prerequisites: WS 486 with D- or better or WS 586 with D- or better or WGSS 486 with D- or better or WGSS 586 with D- or better
Equivalent to: WS 487

WGSS 488. GLOBAL EXPERIENCE III. (1 Credit)
Students reflect on their short-term study abroad experience by engaging in in-depth transnational feminist analysis of particular aspects of the study abroad experience.
Prerequisites: WS 486 with D- or better or WS 487 with D- or better or WGSS 486 with D- or better or WGSS 487 with D- or better
Equivalent to: WS 488

WGSS 490. SELF-ESTEEM AND PERSONAL POWER. (3 Credits)
Explores ways to improve self-esteem and develop personal power. Focuses on issues of self and identity, contextualizing these in the ways gender is constructed in society. (SS)
Attributes: LACS – Liberal Arts Social Core
Equivalent to: WS 490

WGSS 495. *GLOBAL FEMINIST THEOLOGIES. (4 Credits)
Explores the connections between women's religious experiences around the world and the global problems addressed by feminist theology and spirituality. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WS 495
Recommended: WS 223 or WS 223H or WS 224 or WS 224H or WS 223 or WS 223H or WS 224H or junior standing.

WGSS 495H. *GLOBAL FEMINIST THEOLOGIES. (3 Credits)
Explores the connections between women's religious experiences around the world and the global problems addressed by feminist theology and spirituality. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WS 495H, WS 495
Recommended: WS 223 or WS 223H or WS 224 or WS 224H or WS 223 or WS 223H or WS 224 and junior standing.

WGSS 496. *FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WS 496H, WS 496
Recommended: WS 223 or WS 223H or WS 224 or WS 224H or WS 223 or WS 223H or WS 224 and junior standing.

WGSS 496H. *FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WS 496, WS 496H
Recommended: (WS 223 or WS 223H or WS 224 or WS 224H or WS 223 or WS 223H or WS 224) and junior standing

WGSS 498. FEMINIST PRACTICE. (4 Credits)
For graduating seniors in women, gender, and sexuality studies. Building on knowledge and experiences acquired in required and elective women, gender, and sexuality studies courses, it focuses on central questions for feminist research and activism. In particular, the course helps students develop deeper understandings of the process of generating feminist knowledge and its application in diverse forms of feminist practice.
Prerequisites: WS 414 with D- or better and WS 416 [D-]
Equivalent to: WS 498

WGSS 499. TOPICS. (1-6 Credits)
Topics on contemporary research in women, gender, and sexuality studies. May be repeated for credit when topic varies.
Equivalent to: WS 499
This course is repeatable for 12 credits.

WGSS 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: WS 501
This course is repeatable for 16 credits.

WGSS 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: WS 502
This course is repeatable for 16 credits.

WGSS 503. THESIS. (1-16 Credits)
Equivalent to: WS 503
This course is repeatable for 999 credits.

WGSS 506. PROJECTS. (1-16 Credits)
Equivalent to: WS 506
This course is repeatable for 16 credits.

WGSS 510. INTERNSHIP. (1-16 Credits)
The internship experience provides the opportunity to gain experience within off-campus private, public, or community agency or organization which has as one of its goals the improvement of the status of women in society. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the Women, Gender, and Sexuality Studies program.
Equivalent to: WS 510
This course is repeatable for 16 credits.

WGSS 511. ORIENTATION AND PROFESSIONALIZATION I. (1 Credit)
The WGSS 511, 512, 513 sequence prepares Women, Gender, and Sexuality Studies graduate students to succeed in their courses of study and in their chosen profession. WGSS 511 provides knowledge about Women, Gender, and Sexuality Studies as a discipline and as a course of study that helps students manage the transition to graduate school. Graded P/N.
Equivalent to: GRAD 511, WS 511
WGSS 512. ORIENTATION AND PROFESSIONALIZATION II. (1 Credit)
The WGSS 511, 512, 513 sequence prepares Women, Gender, and
Sexuality Studies graduate students to succeed in their courses of
study and in their chosen profession. WGSS 512 guides students in the
development of an intellectual life with a focus on thriving and surviving
as a scholar in Women, Gender, and Sexuality Studies. Graded P/N.
Equivalent to: GRAD 511, WS 512

WGSS 513. ORIENTATION AND PROFESSIONALIZATION III. (1 Credit)
The WGSS 511, 512, 513 sequence prepares Women, Gender, and
Sexuality Studies graduate students to succeed in their courses of study
and in their chosen profession. WGSS 513 focuses on helping students
shape a future that utilizes the graduate degree in Women, Gender, and
Sexuality Studies. It helps students manage the transition to life after the
Women, Gender, and Sexuality Studies Master's program at OSU. Graded
P/N.
Equivalent to: GRAD 511, WS 513

WGSS 514. SYSTEMS OF OPPRESSION: STRATEGIES FOR RESISTANCE.
(4 Credits)
Explores the ways different systems of oppression function in society.
Applies feminist intersectionality approaches to examine interlocking
systems of inequality and privilege.
Equivalent to: WS 514

WGSS 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the
advanced literature review process including construction of the literature
review as product. One of the primary skills graduate students must
master is advanced review of a body of literature for the research
project. Mastery of the literature review process influences quality
and sophistication of claims developed to justify research, with the
written review clearly delineating the unique contribution of the student's
research and the knowledge gap that it fills. The literature review as a
product is a strong written argument that builds a case from credible
evidence based on previous research. CROSSLISTED as ANTH 515/
CSSA 515/ES 515/WGSS 515.
Equivalent to: ANTH 515, CSSA 515, ES 515

WGSS 516. THEORIES OF FEMINISM. (4 Credits)
Explores feminist conceptions about the nature of the world, women's
reality and visions for change. Analyzes major issues raised by the
women's movement and the development of feminist ideas, as well as
provides a critical examination of feminist thought and different theories
which comprise it.
Equivalent to: WS 516
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or
WGSS 223H or WGSS 224

WGSS 517. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques,
especially those based on race and class, with in-depth consideration of
selected social issues such as rape and pornography. CROSSLISTED as
PHL 417/WGSS 417 and PHL 517/WGSS 517.
Equivalent to: PHL 517, WS 517
Recommended: 6 credits of philosophy

WGSS 518. FEMINIST RESEARCH. (4 Credits)
Explores the socio-political and historical context out of which traditional
research methodologies emerge and the relationship of gender to
scientific pursuits. Teaches what it means to do emancipatory anti-sexist
and participatory research.
Equivalent to: WS 518

WGSS 519. FEMINIST LEADERSHIP. (4 Credits)
Examines theories of feminist leadership and applications in non-profit,
governmental, and higher education institutions.
Equivalent to: WS 521

WGSS 520. GRANT AND FUND DEVELOPMENT FOR FEMINIST
ORGANIZATIONS. (4 Credits)
Provides students with the skills needed to be successful in grant-
writing and fundraising for feminist organizations. Students will address
the politics of grant writing and fund raising in relation to the feminist
movement's aims and goals. They will also work directly with agencies to
understand the trade-offs and value/need of securing funding for social
change organizations.
Equivalent to: WS 522

WGSS 521. COMMUNITY ORGANIZING AND COLLECTIVE ACTION. (2
Credits)
Addresses relationships between theory and action in feminist context.
Explores both social change activism in terms of individual and
collective action strategies and social movement theory in historical and
contemporary perspectives.
Equivalent to: WS 523

WGSS 522. TRANS/GENDER POLITICS. (4 Credits)
Addresses transgender politics—including transsexual, genderqueer,
and gender non-conforming issues—through feminist and intersectional
approaches by analyzing transgender theories, arts, and activism.
CROSSLISTED as QS 524/WGSS 524.
Equivalent to: QS 524

WGSS 523. GENDER AND TECHNOLOGY. (3 Credits)
Explores women's contributions and focuses in technology fields.
Analyzes gendered nature of technology. Theory and practice of
technologies for change and activism.
Equivalent to: WS 525

WGSS 524. WOMEN OF COLOR FEMINISMS. (4 Credits)
Explores the contemporary experiences of women of color, as well as
the theoretical and practical frameworks of women of color feminisms.
Analyses key themes in women of color feminisms, including politics
of representation, multiple forms of state and interpersonal violence,
intersecting forms of oppression, economic justice, reproductive justice,
and strategies of resistance.
Equivalent to: WS 530
Recommended: WGSS 223 or WGSS 223H or WS 223 or WS 223H

WGSS 525. QUEER OF COLOR CRITIQUES. (4 Credits)
'Queer of color critiques' refers to political theories and activism that
emerge from LGBTQ people of color to examine the intersections between
race, sexuality and gender. Addresses these intersections through theory,
history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and
ES 531/QS 531/WGSS 531.
Equivalent to: ES 531, QS 531

WGSS 526. GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3
Credits)
A creative and discussion-based course focusing on ways in which
photography can and has addressed issues of gender and sexuality. An
introduction to key concepts and intersections in Women's, Gender
and Sexuality Studies; Queer Studies and photography theory. Create written
and photographic responses to artworks, texts, personal experience and
pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/
QS 532/WGSS 532.
Equivalent to: ART 532, QS 532
WGSS 535. FEMINIST TEACHING AND LEARNING. (4 Credits)
Focuses on the experiences and practices of the feminist classroom. Key components of the class include issues associated with the identity and development of the teacher, as well as the development of skills to help facilitate understanding, empowerment, and the personal and social agency of students.
*Equivalent to: WS 535*

WGSS 536. FEMINIST MEDIA STUDIES. (4 Credits)
Examination of print, radio, television, and new media from feminist perspectives.

WGSS 540. WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women's use and control of natural resources.
*Equivalent to: WS 540*

WGSS 542. THE INCLUSIVE CLASSROOM: DIFFERENCE, POWER AND DISCRIMINATION. (3 Credits)
An examination of multidisciplinary scholarship on difference, power, and discrimination; critical pedagogies; and curriculum transformation. Discussions of theory and research are coupled with practical hands-on opportunities for students to develop and hone their teaching and course development skills. CROSSLISTED as GRAD 542/WGSS 542.
*Equivalent to: GRAD 542*

WGSS 550. ECOFeminISM. (3 Credits)
Focuses on the ecological and feminist principles that mediate humanity's relationship with nature.
*Equivalent to: WS 550*

WGSS 555. FEMINIST TEXTUAL AND DISCOURSE ANALYSIS. (4 Credits)
Graduate students are introduced to current methods and modes of feminist literary, visual culture, performance, new media, and film studies with a focus on application. In doing so, the course focuses on feminist approaches to key topics within textual studies (such as form, authors, and readers) as well as distinct methodological approaches to various genres and mediums (including poems, performances, photographs, and films).

WGSS 560. SEXUALITIES, FEMINISMS, WOMEN. (4 Credits)
Explores the historical, theoretical, and political dimensions of female sexuality. The course also examines the basic assumptions about the meaning of gendered sexuality, how it has been shaped and controlled, and why women's sexuality has been/is a source of both women's liberation and subjugation. In addition, the course incorporates Queer and Trans* theories about gendered/women's sexualities.
*Equivalent to: WS 560 Recommended: WGSS 223 or WGSS 223H or WGSS 224*

WGSS 562. QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSLISTED as QS 462/WGSS 462 and QS 562/WGSS 562.
*Equivalent to: QS 562, WS 562*

WGSS 566. FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employs a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566.
*Equivalent to: PSY 566, WS 566 Recommended: WS 223 or WS 223H or WS 224 or WGSS 240 or WGSS 262 or WGSS 262H or WGSS 270 or WGSS 280 or WGSS 280H or WGSS 321 or WGSS 325 or WGSS 325H or WGSS 340 or WGSS 340H or WGSS 350 or WGSS 360 or WGSS 360H or WGSS 364 or WGSS 364H or WGSS 373 or WGSS 375 or WGSS 380 or WGSS 380H*

WGSS 569. TOPICS IN JOTERIA STUDIES. (3 Credits)
A space for engaging with arts, activism and scholarship emerging from queer Latin@/Chican@ experiences and consciousness is provided. Offered winter term in odd years. CROSSLISTED as ES 569/QS 569/SPAN 569/WGSS 569.
*Equivalent to: ES 569, QS 569, SPAN 569 This course is repeatable for 6 credits.*

WGSS 572. INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
'Two-spirit' refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/WGSS 572.
*Equivalent to: ES 572, QS 572 Recommended: QS 262 or ES 242 or WGSS 414 or WGSS 514*

WGSS 573. TRANSGENDER LIVES. (4 Credits)
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSLISTED as QS 473/WGSS 473 and QS 573/WGSS 573.

WGSS 575. CRITICAL RACE FEMINISM AND OUTSIDER JURISPRUDENCE. (4 Credits)
Critical exploration of critical legal justice movements and their relationship to social identities. Seminar emphasizes specific legal cases, federal and state laws, and constitutional issues that impact groups deemed outsiders in legal discourse as well as their social implications. The critical justice movement and anti-subordination struggles will be explored via case analyses that shape race, class, gender, sexuality, and disability relations. Theoretical contributions of law and society, critical race theory, LatCrit, and critical race feminism, critical white studies, critical mixed race studies, OutCrit, ClassCrit, and critical disability studies applied to historical precedent and current attempts at marginalizing/empowering communities. CROSSLISTED as ES 575/WGSS 575.
*Equivalent to: ES 575*
WGSS 576. TRANSNATIONAL SEXUALITIES. (4 Credits)
Explores contemporary experiences of sexualities within transnational contexts. Analyzes themes including queer and LGBTQI organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSTLISTED as QS 476/WGSS 476 and QS 576/WGSS 576.
Equivalent to: QS 576
Recommended: QS 262

WGSS 577. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSTLISTED as ES 477/QS 477/WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: ES 577, QS 577
Recommended: QS 262 and QS 464

WGSS 582. GLOBAL PERSPECTIVES ON WOMEN'S HEALTH. (4 Credits)
Women's health issues are examined from a global perspective in the context of a woman's life and through a feminist political lens. Central to our discussions will be an analysis of the interplay among race, class, and gender in shaping particular health care outcomes. The course stresses the potential for women's agency and autonomy with respect to improving their health and environments.
Equivalent to: WS 582

WGSS 583. RACE, GENDER, AND HEALTH JUSTICE. (4 Credits)
Based on a social justice framework, this course explores the intersections of race, gender, ethnicity, disability and sexuality to provide a deeper understanding of how these factors shape health inequities in diverse communities nationally and globally.

WGSS 585. TRANSNATIONAL FEMINISMS. (4 Credits)
Introduces students to themes and theoretical principles of transnational feminisms, with special emphasis placed on feminist movements of the global South. We will explore colonialism, globalization, nation-building, representation, global economies, militarism, human rights, and politics of gender, race, class, sexuality, and nation.
Equivalent to: WS 585

WGSS 586. GLOBAL EXPERIENCE I. (1 Credit)
Prepares students to participate in a short-term study abroad experience that emphasizes volunteer experiences in women's organizations and analysis from transnational feminist perspectives.
Equivalent to: WS 586

WGSS 587. GLOBAL EXPERIENCE II. (1 Credit)
Engages students in a short-term study abroad experience that emphasizes volunteer experiences in women's organizations and analysis from transnational feminist perspectives.
Equivalent to: WS 587
Recommended: WS 486 or WS 586 or WGSS 486 or WGSS 586

WGSS 588. GLOBAL EXPERIENCE III. (1 Credit)
Students reflect on their short-term study abroad experience by engaging in in-depth transnational feminist analysis of particular aspects of the study abroad experience.
Equivalent to: WS 588
Recommended: (WS 586 and WS 587) or (WGSS 586 and WGSS 587)

WGSS 595. GLOBAL FEMINIST THEOLOGIES. (4 Credits)
Explores the connections between women's religious experiences around the world and the global problems addressed by feminist theology and spirituality.
Equivalent to: WS 595
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224

WGSS 596. FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences.
Equivalent to: WS 596
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224

WGSS 599. TOPICS. (1-6 Credits)
Topics on contemporary research in women, gender, and sexuality. May be repeated for credit when topic varies.
Equivalent to: WS 599
This course is repeatable for 12 credits.

WGSS 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Individual and collaborative research and scholarship under the supervision of faculty.
This course is repeatable for 16 credits.

WGSS 602. INDEPENDENT STUDY. (1-16 Credits)
Independent study in some field of special interest under the supervision of a faculty member.
This course is repeatable for 16 credits.

WGSS 603. THESIS. (1-12 Credits)
Graded P/N.
This course is repeatable for 999 credits.

WGSS 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics, guided by discussions in conference with faculty.
This course is repeatable for 16 credits.

WGSS 606. PROJECTS. (1-16 Credits)
Special project initiation and participation under the supervision of faculty. Graded P/N.
This course is repeatable for 16 credits.

WGSS 610. INTERNSHIP. (1-6 Credits)
The internship experience provides opportunities to gain experience in a private, public, or community agency or organization, which has social justice advocacy as one of its goals. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the WGSS program. One feature of graduate internships is the opportunity to shadow key personnel in order to meet internship goals. Graded P/N.
This course is repeatable for 6 credits.

WGSS 611. COLLOQUIUM. (1 Credit)
Provides presentations of feminist research by OSU faculty and graduate students and faculty members from other institutions. Graded P/N.
This course is repeatable for 4 credits.

WGSS 616. MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS I. (4 Credits)
Introduces doctoral students to foundational and emerging themes and texts in women, gender, and sexuality studies, with particular emphasis on women of color feminisms, transnational feminisms, and queer feminist critiques. The first seminar in a two-part sequence (WGSS 616 and 617).
WGSS 617. MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS II. (4 Credits)
Introduces doctoral students to foundational and emerging themes and texts in women, gender, and sexuality studies, with particular emphases on women of color feminisms, transnational feminisms, and queer feminist critiques. The second seminar in a two-part sequence (WGSS 616 and 617).
Prerequisites: WGSS 616 with B or better

WGSS 618. FEMINIST PARTICIPATORY ACTION RESEARCH. (4 Credits)
An examination of theories, principles and strategies of PAR, and appreciation of advantages and limitations of this approach and skills necessary for participating effectively in PAR projects. Recommended: Any upper-division graduate level course in research methods.

WGSS 619. DECOLONIZING METHODS. (4 Credits)
Navigates from feminist philosophy of science interventions to postcolonial, Chicana/Latina, and critical race criticisms of methodological stances in 'normal' science. Standpoint methodologies, racialized and gendered origins of modern statistical methods, longstanding affinity between colonial inequalities and Eurocentric scientific inquiry, and successor sciences/sciences from below constitute the main themes of the course.

WGSS 620. SOCIAL JUSTICE THEORY AND PRACTICE. (4 Credits)
An examination of social justice theories and practices. Specifically engages with issues of power and privilege, systems of oppression, intersectionality, and social activism. Explores the practices of social justice movements.

World Languages and Cultures

WLC 159. *LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION. (4 Credits)
Unpack language, race and racism--as well as the intersections between those ideas-- as cornerstones to understanding identity and society as inherently socially constructed notions. CROSSLISTED as ANTH 159/ES 159/WLC 159. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ANTH 159, ES 159

WLC 221H. *MASTERPIECES OF GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present. Class lectures discussing key works of German cinema will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films accompany the lectures. Taught in English. Film fee will be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: WLC 221

WLC 222. *WOMEN IN ITALIAN CINEMA. (3 Credits)
An exploration of filmic portrayals of women as participants in social, economic and political life in Italy. Examines Italian cinema as a reflection of Italian culture. Focuses on women as protagonists, symbolic figures and filmmakers. Analysis will be presented through a variety of historical, critical and theoretical approaches. Taught in English. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: IT 261

WLC 230. *FRANCE TODAY: CULTURES WITHIN AND BEYOND ITS BORDERS. (3 Credits)
An exploratory study of French culture and society since 1945. Topics include: decolonization, immigration, Francophone intellectual currents, France’s European vocation, and social conflict today. Conducted in English. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: FR 270, FR 270H, WLC 230

WLC 230H. *FRANCE TODAY: CULTURES WITHIN AND BEYOND ITS BORDERS. (3 Credits)
An exploratory study of French culture and society since 1945. Topics include: decolonization, immigration, Francophone intellectual currents, France’s European vocation, and social conflict today. Conducted in English. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 230, FR 230H, WLC 230

WLC 231. *GERMAN DICTATORSHIPS: NAZIS AND COMMUNISTS. (3 Credits)
Introduction to the two best-known dictatorships in German society, National Socialism of the Third Reich from 1933-1945 and Socialism in the German Democratic Republic from 1949-1989 via the study of visual media (feature films, documentaries, newsreels, etc.) and other primary and secondary sources. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: GER 231, GER 231H, WLC 231H

WLC 231H. *GERMAN DICTATORSHIPS: NAZIS AND COMMUNISTS. (3 Credits)
Introduction to the two best-known dictatorships in German society, National Socialism of the Third Reich from 1933-1945 and Socialism in the German Democratic Republic from 1949-1989 via the study of visual media (feature films, documentaries, newsreels, etc.) and other primary and secondary sources. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: GER 231H

WLC 232. *INTRODUCTION TO JEWISH CULTURE. (3 Credits)
An overview of Jewish culture from its origins to the present day. Students will compare and contrast the lifestyles, ideologies, religious and cultural practices of Jews living in Israel and the United States; two divergent cultures that developed from similar roots. Taught in English. Taught via ECampus only. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HEBR 231

WLC 233. *RUSSIAN CULTURE I. (3 Credits)
Introduction to basic features of Russian culture originating in the past and continuing into the present. Aspects of history, politics, economics, geography, art, music, literature, and everyday life. Compares Russian culture with Western European and American culture. WLC 233: Old Russia; WLC 234: 19th Century; WLC 235: 20th Century. Taught in English. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: RUS 231
WLC 234. *RUSSIAN CULTURE II. (3 Credits)
Introduction to basic features of Russian culture originating in the past
and continuing into the present. Aspects of history, politics, economics,
geography, art, music, literature, and everyday life. Compares Russian
culture with Western European and American culture. WLC 233: Old
Russia; WLC 234: 19th Century; WLC 235: 20th Century. Taught in English.
(H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and
Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities
Core
Equivalent to: RUS 232

WLC 235. *RUSSIAN CULTURE III. (3 Credits)
Introduction to basic features of Russian culture originating in the past
and continuing into the present. Aspects of history, politics, economics,
geography, art, music, literature, and everyday life. Compares Russian
culture with Western European and American culture. WLC 233: Old
Russia; WLC 234: 19th Century; WLC 235: 20th Century. Taught in English.
(H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West
Culture; LACH – Liberal Arts Humanities Core
Equivalent to: RUS 233

WLC 241. *GRIMMS’ FAIRY TALES. (4 Credits)
We will read a selection of the most popular Grimms’ fairy tales and
consider why they have remained so popular. What is it about fairy tales
that has made them such a lasting source of creative inspiration into
our time? Students will learn to understand and critique fairy tales and
their role in Western cultures through analysis of the tales and creative
adaptation of a tale for a modern audience. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: GER 241

WLC 261. *MASTERPIECES GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present.
Class lectures discussing key works of German cinema will offer a variety
of historical, critical and theoretical approaches. Weekly screenings of
important films accompany the lectures. Taught in English. Film fee will
be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: GER 261, GER 261H, WLC 261H

WLC 261H. *MASTERPIECES GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present.
Class lectures discussing key works of German cinema will offer a variety
of historical, critical and theoretical approaches. Weekly screenings of
important films accompany the lectures. Taught in English. Film fee will
be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course
Designator
Equivalent to: GER 261, GER 261H, WLC 261

WLC 301. *INTRODUCTION TO WORLD LANGUAGE AND CULTURE
STUDIES. (4 Credits)
Addresses the structure, histories, and cultures associated with world
languages and presents skills for learning languages more effectively.
Includes related topics such as globalization, colonialism, and language
justice; language policy, linguistic diversity, and language death;
immigration and migration; race and racism. This is a required course in
the WLC major in the Literacies thematic area. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

WLC 320. *FRANCOPHONE CULTURES IN FILM. (3-9 Credits)
An exploration of the different cultures of France and the Francophone
world through film. Students will delve into the heart of these societies
and discover their socio-historical, political, economic and cultural
context. Students' analytical and critical skills will be thoroughly solicited
through various research and writing activities. Taught in English. (Bacc
Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: FR 329, FR 329H, WLC 320H
This course is repeatable for 9 credits.

WLC 320H. *FRANCOPHONE CULTURES IN FILM. (3-9 Credits)
An exploration of the different cultures of France and the Francophone
world through film. Students will delve into the heart of these societies
and discover their socio-historical, political, economic and cultural
context. Students' analytical and critical skills will be thoroughly solicited
through various research and writing activities. Taught in English. (Bacc
Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course
Designator
Equivalent to: FR 329, FR 329H, WLC 320
This course is repeatable for 9 credits.

WLC 321. *MODERN SPAIN THROUGH SPANISH CINEMA. (3 Credits)
Examines the history of modern Spain and its cinematography via the
study of key Spanish films and cineastes in the twentieth and twenty-first
centuries. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture
Equivalent to: SPAN 361

WLC 331. *CHINESE CULTURE I. (3 Credits)
Introduction to basic features of Chinese culture from ancient times
to the 9th century. Topics include philosophy and religion, the Chinese
language, literature and the arts, science and technology, government,
family and gender, social and economic conditions, contacts with the
outside world. Taught in English. Open to all students. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-
Western Core
Equivalent to: CHN 331

WLC 332. *CHINESE CULTURE II. (3 Credits)
Introduction to basic features of Chinese culture from the 10th through
the 19th centuries. Topics include philosophy and religion, literature and
the arts, science and technology, government, family and gender, social
and economic conditions, daily life, and contacts with the outside world.
Taught in English. Open to all students. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-
Western Core
Equivalent to: CHN 332

WLC 333. *CHINESE CULTURE III. (3 Credits)
Survey of important developments of Chinese society and culture from
the early 20th century to the present. Topics include wars and revolutions,
economic, political, and social conditions, the new culture movement,
changing family structure and women's status, relationships within
greater China (Mainland China, Taiwan, and Hong Kong). Taught in
English. Open to all students. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-
Western Core
Equivalent to: CHN 333
WLC 334. FASHION AND DESIGN IN THE FRANCOPHONE WORLD. (3 Credits)
A study of the world of French fashion and design: origins and history, what’s new and exciting in French fashion today and attitudes about fashion and beauty of design that have given the French the inside track on prestige in this arena for centuries.
Equivalent to: FR 338

WLC 335. *JAPANESE CULTURE I. (3 Credits)
An introductory survey of Japanese history, arts, literature, society, and traditions from the ancient to the mid-19th century. Taught in English. May not be offered every year. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: JPN 331

WLC 336. *JAPANESE CULTURE II. (3 Credits)
An introductory survey of Japanese history, arts, literature society, and traditions from the ancient to the mid-19th century. May not be offered every year. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: JPN 332

WLC 337. *JAPANESE CULTURE III. (3 Credits)
A survey of Japan from the mid-19th century to the present in areas including arts, literature, business, education, society, politics, and foreign relations. Taught in English. May not be offered every year. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: JPN 333

WLC 338. *DEAF CULTURE. (4 Credits)
Introduction to Deaf culture in the United States. Includes discussion and analysis of issues relevant to Deaf culture, including politics, language, education, art, literature, media representations, and contemporary life in the Deaf community. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

WLC 339. *DEAF HISTORY. (4 Credits)
This course covers the history of Deaf people and the Deaf community in the United States. It examines the historical and contemporary impacts of US social, political, legal, educational, and economic systems on the Deaf experience. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

WLC 360. INTERNATIONAL FILM FESTIVAL. (3 Credits)
Critical study of a selection of films screened at the Oregon State University’s International Film Festival. Topics include acting, sound, special effects, cinematography. CROSSLISTED as FILM 360/WLC 360.
Equivalent to: FILM 360
This course is repeatable for 9 credits.
Recommended: Sophomore standing or higher.

WLC 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSLISTED as ES 361/ QS 361/WGSS 361/WLC 361.
Equivalent to: ES 361, QS 361, WGSS 361
Recommended: Prior filmmaking experience

WLC 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ANTH 373, ES 373, WGSS 373

WLC 399. SPECIAL TOPICS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

WLC 410. WORLD LANGUAGE INTERNSHIP. (1-12 Credits)
Opportunities for juniors and seniors to apply skills in world language and knowledge of world culture at selected government, industry, or business placement sites. Allows students to prepare for transition from academic to work world. Interns are supervised and evaluated by employer and faculty coordinator. See also Oregon International Internships in the catalog section on International Programs. Graded P/N.
Equivalent to: FLL 410
This course is repeatable for 16 credits.
Recommended: Completion of 90 credits with 2.75 GPA or higher; completion of the third-year language course in one foreign language with 3.00 GPA or better, with at least three terms of study in the OSU School of Language, Culture, and Society.

WLC 429. *FRENCH SOCIETY THROUGH ITS CINEMA. (3 Credits)
An examination of French society through its own cinema. Via the screening and study of films from the various periods of French history, students will delve into the heart of French society and will discover the socio-historical, political, economic and cultural context. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

WLC 429H. *FRENCH SOCIETY THROUGH ITS CINEMA. (3 Credits)
An examination of French society through its own cinema. Via the screening and study of films from the various periods of French history, students will delve into the heart of French society and will discover the socio-historical, political, economic and cultural context. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 429, FR 429H, WLC 429H

WLC 459. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ANTH 459, ES 459
WLC 473. COMMUNITY-BASED LEARNING. (3 Credits)
A service-learning course that allows students to apply the theory and skills acquired in advanced linguistics, culture, and literature courses to specific needs of populations that speak a language taught in the department. It combines 80 hours of community-supervised fieldwork with an online academic component consisting of assigned readings, independent research, and ongoing reflective writing. Each student is expected to make significant contributions toward the completion of a deliverable product that benefits a native speaker community. Pre-advanced oral proficiency required.
*This course is repeatable for 6 credits.*

WLC 483. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/ their program of study. CROSSTILLED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
*Equivalent to: ENG 483, ES 483, PS 483*

WLC 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSTILLED as ANTH 485/ES 485/WGSS 485/WLC 485.
*Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D] or ES 410 [D] or WGSS 410 [D] or WLC 410 [D])*
*Equivalent to: ANTH 485, ES 485, WGSS 485*
*This course is repeatable for 4 credits.*

WLC 499. SPECIAL TOPICS. (1-16 Credits)
*Equivalent to: WLC 499H*
*This course is repeatable for 16 credits.*

WLC 499H. SPECIAL TOPICS. (1-16 Credits)
*Attributes: HNRS – Honors Course Designator*
*Equivalent to: WLC 499*
*This course is repeatable for 16 credits.*

WLC 510. WORLD LANGUAGE INTERNSHIP. (1-12 Credits)
Opportunities for juniors and seniors to apply skills in world language and knowledge of world culture at selected government, industry, or business placement sites. Allows students to prepare for transition from the academic world to the work world. Interns are supervised and evaluated by the employer and a faculty coordinator. See also Oregon International Internships in the catalog section on International Programs. Graded P/N.
*Equivalent to: FLL 510*
*This course is repeatable for 16 credits.*

**Recommended:** Completion of 90 credits with 2.75 GPA or higher; completion of the third-year language course in one foreign language with 3.00 GPA or better, with at least three terms of study in the OSU School of Language, Culture, and Society.

WLC 559. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSTILLED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
*Equivalent to: ANTH 559, ES 559*

WLC 583. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/ their program of study. CROSSTILLED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
*Equivalent to: ENG 583, ES 583, PS 583*

WLC 599. SPECIAL TOPICS. (1-16 Credits)
*This course is repeatable for 16 credits.*

**Anthropology Graduate Minor**

The School of Language, Culture, and Society offers graduate work leading to a Master of Arts in Applied Anthropology. The school also offers graduate work leading to a master of arts in interdisciplinary studies and participates as a minor field in other advanced degree programs. A variety of individualized programs is available within the MAIS framework.

**Minor Code: 8600**

**Anthropology Minor**

Also available via Ecampus.

Undergraduate students may elect the Anthropology minor to complement coursework in their major discipline.

**Minor Code: 860**

**Additional Anthropology credits to total 27 with the following restrictions:**

- No more than 6 blanket credits (ANTH 401–ANTH 409)
- No more than 6 internship credits (ANTH 410)
- At least 12 400-level credits, excluding blanket credits and internship credits
Anthropology Undergraduate Major (BA, BS, HBA, HBS)

Also available via Ecampus.

Anthropology seeks to promote awareness of the complexity and diversity of humanity and the human experience—past and present—in its cultural, biological, and ecological contexts. An Anthropology degree emphasizes cultural sensitivity and enables students to pursue a broad range of jobs requiring a liberal arts background; for example, education, human and governmental services, law, business, media and medicine. It prepares them especially well for work situations that emphasize cross-cultural awareness, international contacts and management of cultural resources. Anthropology curriculum provides a sound basis for later professional or graduate education. Four options are available: archaeology, biocultural, cultural/linguistic, and general anthropology. Completion of an option is required to earn a degree in Anthropology.

Major Code: 860

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Core 1</td>
<td>Select three courses from the following:</td>
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<tr>
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<td>ANTH 101 *INTRODUCTION TO ANTHROPOLOGY</td>
<td></td>
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<td></td>
<td>ANTH 210 *COMPARATIVE CULTURES</td>
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<td>ANTH 230 TIME TRAVELERS</td>
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<td>ANTH 240 INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY</td>
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<tr>
<td>Core 2</td>
<td>ANTH 345 *BIOLOGICAL AND CULTURAL CONSTRUCTIONS OF RACE</td>
<td>3</td>
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<td>ANTH 350 LANGUAGE, CULTURE AND SOCIETY</td>
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<td></td>
<td>ANTH 370 *ANTHROPOLOGICAL THEORIES</td>
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<td>ANTH 475 ANTHROPOLOGY IN PRACTICE</td>
<td>4</td>
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<td>Option</td>
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<tr>
<td>Total credits required for graduation</td>
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</table>

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

In certain cases, an extra course taken in this category can be counted as an elective. Please check with the Anthropology advisor.

Majors must additionally fulfill requirements for one of the options, plus upper-division electives in Anthropology to complete a total of 60 credits for the major. The following restrictions apply:

- No more than 6 credits internship ANTH 410
- No more than 6 credits from ANTH 311, ANTH 312, ANTH 313, ANTH 314, ANTH 315, ANTH 316, ANTH 317, ANTH 318, ANTH 319
- At least 12 credits at the 400-level excluding blanket-numbered (ANTH 401 – ANTH 409) and internship (ANTH 410) credits
- A grade of C– or better is required for all courses used to complete major requirements. Such courses cannot be taken S/U

Major Code: 860

Archaeology Option

This option is offered within the following major(s):

- Anthropology - College of Liberal Arts (p. 736)

Also available via Ecampus.

The Archaeology option focuses on the material remains of past cultures and their environments. This option provides students with the essential field and laboratory skills necessary to collect, analyze, and curate archaeological materials, as well as meet the ethical issues and legal responsibilities concerning cultural resource management.

Option Code: 854

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Foundations</td>
<td>ANTH 332 ARCHAEOLOGICAL INFERENCE</td>
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<td>ANTH 435 CULTURAL RESOURCES: POLICY AND PROCEDURES</td>
<td>4</td>
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<td>ANTH 438 ARCHAEOLOGY FIELD SCHOOL</td>
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<td>Electives</td>
<td>Select four courses for a minimum of 13 credits from the following:</td>
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<td>ANTH 331 MESOAMERICAN PREHISTORY</td>
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<td>ANTH 371 RESEARCH METHODS IN CULTURAL ANTHROPOLOGY</td>
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<td>ANTH 421 ANALYSIS OF LITHIC TECHNOLOGIES</td>
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<td>ANTH 423 METHOD AND THEORY IN HISTORICAL ARCHAEOLOGY</td>
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<td>ANTH 424 SETTLEMENT ARCHAEOLOGY</td>
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<td>ANTH 425 CERAMIC ANALYSIS IN ARCHAEOLOGY</td>
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<td>ANTH 430 TOPICS IN ARCHAEOLOGY</td>
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<td>ANTH 432 *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION</td>
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<td>ANTH 433 FIRST AMERICANS, LAST FRONTIERS</td>
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<td>ANTH 434 NORTH AMERICA AFTER THE ICE AGE</td>
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<td>ANTH 436 NORTHWEST PREHISTORY</td>
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<td>ANTH 437 GEOARCHAEOLOGY</td>
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<td>ANTH 439 ARCHAEOLOGY OF FORAGERS</td>
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<td>ANTH 441 HUMAN EVOLUTION</td>
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<td>ANTH 443 HUMAN OSTEOLOGY LAB</td>
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<td>ANTH 492 ARCHAEOLOGICAL LABORATORY METHODS</td>
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<td>ANTH 497 ARCHAEOLOGICAL FIELD METHODS</td>
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* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Biocultural Option

This option is offered within the following major(s):

- Anthropology - College of Liberal Arts (p. 736)

Also available via Ecampus.

The Biocultural option focuses on the ways evolutionary biology, political-economy, ecology, and culture interact to influence human health and behavior, over time and in cross-cultural perspective. This option prepares students to engage in ethical fieldwork, laboratory work, and data analyses, to ultimately understand the intersections of biomarkers and other indicators of human health status, demographic processes, social relationships, cultural norms, and political and economic inequalities.

Option Code: 854

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Foundations</td>
<td>Select five courses for a minimum of 18 credits from the following:</td>
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<td></td>
<td>ANTH 331 MESOAMERICAN PREHISTORY</td>
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<td>ANTH 371 RESEARCH METHODS IN CULTURAL ANTHROPOLOGY</td>
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<td>ANTH 421 ANALYSIS OF LITHIC TECHNOLOGIES</td>
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<td>ANTH 423 METHOD AND THEORY IN HISTORICAL ARCHAEOLOGY</td>
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<td>ANTH 424 SETTLEMENT ARCHAEOLOGY</td>
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<td>ANTH 425 CERAMIC ANALYSIS IN ARCHAEOLOGY</td>
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<td>ANTH 430 TOPICS IN ARCHAEOLOGY</td>
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<td>ANTH 432 *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION</td>
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<td>ANTH 433 FIRST AMERICANS, LAST FRONTIERS</td>
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<td>ANTH 434 NORTH AMERICA AFTER THE ICE AGE</td>
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<td>ANTH 436 NORTHWEST PREHISTORY</td>
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<td>ANTH 437 GEOARCHAEOLOGY</td>
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<td>ANTH 439 ARCHAEOLOGY OF FORAGERS</td>
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<td>ANTH 441 HUMAN EVOLUTION</td>
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<td>ANTH 492 ARCHAEOLOGICAL LABORATORY METHODS</td>
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<td>Total Hours</td>
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</table>
**GENERAL ANTHROPOLOGY Option**

This option is offered within the following major(s):

- Anthropology - College of Liberal Arts (p. 736)

**Also available via Ecampus.**

**Option Code: 855**

**General Anthropology Option**

This option is offered within the following major(s):

- Anthropology - College of Liberal Arts (p. 736)

Also available via Ecampus.

**Option Code: 864**

**Cultural/Linguistic Option**

This option is offered within the following major(s):

- Anthropology - College of Liberal Arts (p. 736)

Also available via Ecampus.

The Cultural/Linguistic option focuses on the diversity of living cultures, in terms of their subsistence practices, sacred and secular rituals, economies, technology, arts, language, and social institutions. This concentration prepares the student to engage in ethnographic research and to follow ethical and professional standards for cultural sensitivity in interpersonal and cross-cultural interactions.

**Option Code: 855**

**Applied Anthropology Graduate Major (MA, MS, PhD)**

The MA, MS, and PhD degrees in Applied Anthropology provide advanced education in anthropology that will prepare students to practice their skills in occupations in both public and private sectors at the local, national, and international levels. These courses of study integrate...
anthropological theory and practice within a specific concentration chosen by the student.

Major Code: 8640

MA, MS Program Requirements

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<tr>
<th>Code</th>
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<tr>
<td>ANTH 575</td>
<td>THEORY OF CULTURE</td>
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<td>ANTH 593</td>
<td>STATISTICAL APPLICATIONS IN ANTHROPOLOGY 1</td>
<td>4</td>
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<tr>
<td>ANTH 595</td>
<td>ANTHROPOLOGICAL RESEARCH DESIGN</td>
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<tr>
<td>2. Major Specialization</td>
<td>Select 12 credits in one of the following options:</td>
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<tr>
<td>Archaeology</td>
<td>ANTH 531</td>
<td>ARCHAEOLOGICAL THEORY</td>
</tr>
<tr>
<td></td>
<td>ANTH 535</td>
<td>CULTURAL RESOURCES: POLICY AND PROCEDURES</td>
</tr>
<tr>
<td></td>
<td>ANTH 543</td>
<td>HUMAN OSTEOLOGY LAB</td>
</tr>
<tr>
<td>Biocultural Anthropology</td>
<td>ANTH 583</td>
<td>ADVANCED MEDICAL ANTHROPOLOGY</td>
</tr>
<tr>
<td></td>
<td>ANTH 585</td>
<td>USES OF ANTHROPOLOGY</td>
</tr>
<tr>
<td></td>
<td>ANTH 591</td>
<td>ETHNOGRAPHIC METHODS</td>
</tr>
<tr>
<td>Cultural/Linguistic Anthropology</td>
<td>ANTH 576</td>
<td>ADVANCED ANTHROPOLOGICAL THEORY SEMINAR</td>
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<tr>
<td></td>
<td>ANTH 585</td>
<td>USES OF ANTHROPOLOGY</td>
</tr>
<tr>
<td></td>
<td>ANTH 591</td>
<td>ETHNOGRAPHIC METHODS</td>
</tr>
<tr>
<td>3. Supporting Courses in Anthropology</td>
<td>Any combination of 500-level courses as approved by your advisor/committee</td>
<td>12</td>
</tr>
<tr>
<td>4. Outside Skills/Minor</td>
<td>Any combination of 500-level courses in another discipline that facilitate student's mastery of knowledge and skills needed to carry out original research as approved by advisor/committee</td>
<td>15</td>
</tr>
<tr>
<td>5. Internship</td>
<td>Select 6-12 credits</td>
<td></td>
</tr>
<tr>
<td>6. Thesis</td>
<td>Select 6-12 credits</td>
<td></td>
</tr>
<tr>
<td>7. Seminar, &quot;Tan Sack&quot;</td>
<td>ANTH 507</td>
<td>SEMINAR</td>
</tr>
</tbody>
</table>

1 or equivalent course, e.g., H 524 or FES 523.

Degree Type Proficiencies

For the Master of Arts degree, the student must show second proficiency (including American Sign Language) equivalent to that attained at the end of a second-year university course in that language with a grade of ‘C’ (2.00) or better. Students who have successfully completed at least two years of high school in a language other than English will have fulfilled this requirement.

The Master of Science degree is an option for students specializing in archaeology and biocultural anthropology, where appropriate, pending approval of the major professor. The student must show technical proficiency in areas that emphasize scientific methodological skills (e.g., GIS, statistics, and epidemiology). The MS student is encouraged to undertake the 15 credits of proficiency as part of their outside skills/minor requirements. This will be in lieu of the language proficiency required for MA. The courses for the MS degree must be completed and approved by the student’s Committee before the student takes the final oral examination for the degree. Students specializing in cultural/linguistic anthropology are not eligible for the MS.

MAIS Degree

The school also participates in the Master of Arts in Interdisciplinary Studies (MAIS) degree program. In other advanced degree programs, anthropology may be used as a minor. See the Graduate School for details.

PhD Requirements

1. Students must have MA or MS in Anthropology or related discipline (34 credits)
Students must bring in graduate credits to cover the equivalent of the courses central to the MA/MS in Applied Anthropology at Oregon State University (20 credits, see below) plus 14 credits of graduate level Anthropology courses or graduate courses in relevant disciplines as agreed upon by the major professor. If these requirements are not met upon entrance to the program, they must be earned after admittance. Students will work with their major professors in consultation with the Director of Graduate Studies to assess what can be accepted from past work and what must be made up at OSU.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Core Requirements</td>
<td>ANTH 610</td>
<td>Comprehensive Review</td>
</tr>
<tr>
<td></td>
<td>Statistics</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Methods (such as Ethnographic Methods or Osteology or Archaeological Methods, etc.)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Course in Applied Anthropology or Uses of Anthropology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>20</td>
</tr>
</tbody>
</table>
| 2. Specialization Courses (25 credits) | Specialization courses are those that enable students to develop their knowledge in order to do effective comprehensive exams and dissertation work in their particular field of expertise. Students work with their major professor and their Committee to determine what courses will be most helpful for them. Specializations courses must include ANTH 695 for developing their dissertation research project, two courses in Anthropology, and 2 credits of "Tan Sack" (ANTH 607). All other specialization courses may be within or outside of Anthropology.

3. Second Language Proficiency
Evidenced by passing two years of university-level second language study or by passing the proficiency exam. Must be completed before Comprehensive Exams are taken. A substitution of skill sets is possible for archaeology students in consultation with the major professor and the Director of Graduate Studies.

4. Graduate Minor is optional

5. Residency (6 credits)
ANTH 610

6. Comprehensive Exams (9 credits)
ANTH 699 Comprehensive Review

7. Dissertation (36 credits)
ANTH 603

Major Code: 8640

Applied Anthropology Graduate Minor

The School of Language, Culture, and Society offers graduate work leading to a Master of Arts in Applied Anthropology. The school also offers graduate work leading to a master of arts in interdisciplinary studies and participates as a minor field in other advanced degree
Asian Languages and Cultures Minor

Provides a broad background in Asian languages and cultures which will enable the student to explore Asia from various disciplinary perspectives in order to prepare for graduate study or a professional career.

Minor Code: 939

A total of 30 credits are required, 18 of which must be upper-division courses. 12 credits out of the 18 credits must be completed in residence with an average grade of C. The courses offered through Ecampus are included.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CHN 211</td>
<td>SECOND-YEAR CHINESE</td>
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<tr>
<td>&amp; CHN 212</td>
<td>and SECOND-YEAR CHINESE</td>
<td>4</td>
</tr>
<tr>
<td>&amp; CHN 213</td>
<td>and SECOND-YEAR CHINESE</td>
<td>4</td>
</tr>
<tr>
<td>CHN 311</td>
<td>THIRD-YEAR CHINESE LANGUAGE</td>
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<tr>
<td>&amp; CHN 312</td>
<td>and THIRD-YEAR CHINESE LANGUAGE</td>
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</tr>
<tr>
<td>&amp; CHN 313</td>
<td>and THIRD-YEAR CHINESE LANGUAGE</td>
<td>6</td>
</tr>
<tr>
<td>WLC 333</td>
<td>*CHINESE CULTURE III</td>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>JPN 211</td>
<td>SECOND-YEAR JAPANESE</td>
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<tr>
<td>&amp; JPN 212</td>
<td>and SECOND-YEAR JAPANESE</td>
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</tr>
<tr>
<td>&amp; JPN 213</td>
<td>and SECOND-YEAR JAPANESE</td>
<td>4</td>
</tr>
<tr>
<td>JPN 311</td>
<td>THIRD-YEAR JAPANESE</td>
<td>6</td>
</tr>
<tr>
<td>&amp; JPN 312</td>
<td>and THIRD-YEAR JAPANESE</td>
<td>6</td>
</tr>
<tr>
<td>&amp; JPN 313</td>
<td>and THIRD-YEAR JAPANESE</td>
<td>6</td>
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<tr>
<td>WLC 337</td>
<td>*JAPANESE CULTURE III</td>
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Electives 6

Select 6 credits of the following after consultation with an advisor:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>WLC 331</td>
<td>*CHINESE CULTURE I</td>
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<td>WLC 332</td>
<td>*CHINESE CULTURE II</td>
<td>2</td>
</tr>
<tr>
<td>WLC 335</td>
<td>*JAPANESE CULTURE I</td>
<td>2</td>
</tr>
<tr>
<td>WLC 336</td>
<td>*JAPANESE CULTURE II</td>
<td>2</td>
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</table>

Special topics in Chinese/Japanese Language, culture, and literature

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHN 399</td>
<td>SPECIAL TOPICS</td>
</tr>
<tr>
<td>JPN 399</td>
<td>SPECIAL TOPICS</td>
</tr>
</tbody>
</table>

Courses related to China or Japan in other OSU departments or completed abroad on an approved study-abroad program.

Total Hours 30

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

College Student Services Administration Graduate Major (EDM, MS)

Graduate Areas of Concentration

College and university characteristics and environments; history, development, and current issues in higher education; leadership and management of administrative departments; program oversight in specialized administrative areas such as financial aid, student activities, career services, multicultural affairs, recreational sports, and student housing; student development theory and application

Also available via Ecampus (http://ecampus.oregonstate.edu/).

The College Student Services Administration program offers preparation in the organization, leadership and administration of programs, services, and facilities in postsecondary education, including college union/centers, recreational sports, student government and activities, residence life programs, student housing, financial aid, career services, and general student advising and academic support.

CSSA students have two degree tracks from which to select:

This first degree track, the Master of Education (EdM), is earned through successful completion of all required program course work and successful completion and defense of a capstone portfolio. The capstone portfolio is a cumulative, comprehensive, and reflective form of student assessment. Completing a portfolio requires that the student address each program competency in a comprehensive, meaningful, and creative way. The portfolio “product” can be shared in any number of formats, including, but not limited to, writings, pictures, audio or video clips, and electronic media (websites, PowerPoint documents, etc.). Final portfolios are distributed to and evaluated in writing by a committee just prior to the last term of course work. A public, formal committee meeting with oral presentation and defense serves as the second method of evaluation.

The second degree track, the Master of Science (MS), is earned through successful completion of all required program course work and successful completion and defense of thesis. In addition to required course work and the thesis, students pursuing the MS degree must also demonstrate adequate evidence of competence and learning in each of the five CSSA competency areas. Demonstration of this evidence may take the form of an extended/detailed competency plan with select work samples or other methods approved by the major professor. This demonstration need not be a portfolio, but it should clearly show evidence of competency mastery. Thesis research should be reflected in the demonstration.

For thesis work, CSSA and university policies require students to convene

a. a proposal meeting to present their research plan (generally spring of the first year for full-time students or fall/winter of the second year for part-time students) and
b. a final defense for presentation and evaluation of the research and competency demonstration (final term of course work).

Students who wish to pursue the MS should decide this early in their graduate program, ideally during the first term, since such research requires careful and lengthy planning. Major professors should be made aware of this decision.

Major Code: 2200

Graduation from the program requires the following

- Successful completion of at least 54 credits of graduate-level course work, the majority of which are required in the major field of study (CSSA). Additionally, a minor or area of specialization is chosen and completed by the individual student; and
Ethnic Studies Graduate Minor

Graduate Areas of Concentration

Ethnic studies

Graduate work in the School of Language, Culture, and Society may serve as a field of study for the Master of Arts in Interdisciplinary Studies degree or as a minor in other advanced degree programs. The program offers an interdisciplinary exploration of the critical areas of race, class, ethnicity, and gender in American life, as well as focused study of the four major ethnic minority groups in the United States (African Americans, Asian Americans, Chicano/Latinos and Native Americans).

Students applying for graduate work in ethnic studies must meet the following requirements:

1. a minimum GPA of 3.00 in the last 90 credits of graded undergraduate work on the first baccalaureate degree plus all work completed thereafter;
2. appropriate undergraduate or postgraduate work in ethnic studies.

Applicants are urged to speak with an advisor prior to submitting their materials.

Minor Code: 8940

Ethnic Studies Minor

Also available via Ecampus.

Ethnic Studies is an interdisciplinary field focused on critical engagement with the historical and ongoing ways in which race and ethnicity shape everyday life in the United States, but also within a global context. A minor in Ethnic Studies provides students with a strong background and set of analytical skills to address issues of difference and inequality in a wide range of areas, from policy, to institutions and community settings, to pop culture, media, and literature, and is a valuable complement to any major.

Minor Code: 894

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Core 1</td>
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</tr>
<tr>
<td>ES 101</td>
<td>*INTRODUCTION TO ETHNIC STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>ES 201</td>
<td>*INVENTING ETHNIC AMERICA</td>
<td>3</td>
</tr>
<tr>
<td>200-Level Courses</td>
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<td></td>
</tr>
<tr>
<td>Select two courses from the following:</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>ES 211</td>
<td>*INTRODUCTION TO LATINO/A STUDIES</td>
<td></td>
</tr>
<tr>
<td>ES 213</td>
<td>*LATINO/A IDENTITIES AND ACTIVISM</td>
<td></td>
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<tr>
<td>ES 221</td>
<td>*SURVEY OF AFRICAN AMERICAN STUDIES I</td>
<td></td>
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<tr>
<td>ES 223</td>
<td>*SURVEY OF AFRICAN AMERICAN STUDIES II</td>
<td></td>
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<tr>
<td>ES 231</td>
<td>*INTRODUCTION TO ASIAN AMERICAN STUDIES</td>
<td></td>
</tr>
<tr>
<td>ES 233</td>
<td>*ASIAN PACIFIC AMERICAN ACTIVISM AND EMPowerment</td>
<td></td>
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<tr>
<td>ES 241</td>
<td>*INTRODUCTION TO NATIVE AMERICAN STUDIES</td>
<td></td>
</tr>
<tr>
<td>ES 243</td>
<td>*NATIVE AMERICAN ASSIMILATION AND ACTIVISM</td>
<td></td>
</tr>
<tr>
<td>ES 260</td>
<td>*INTRODUCTION TO PACIFIC ISLANDS STUDIES</td>
<td></td>
</tr>
<tr>
<td>Upper-Division Electives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select four courses from the following with at least two at the 400 level:</td>
<td>14-16</td>
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</tr>
<tr>
<td>ES 311</td>
<td>NARRATIVES OF LATINO MIGRATIONS</td>
<td></td>
</tr>
<tr>
<td>ES 321</td>
<td>AFRICAN AMERICAN POLITICAL AND SOCIAL THOUGHT: 20TH CENTURY</td>
<td></td>
</tr>
<tr>
<td>ES 323</td>
<td>CONTEMPORARY AFRICAN AMERICAN SOCIAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>ES 322</td>
<td>ASIAN PACIFIC AMERICANS AND THE MEDIA</td>
<td></td>
</tr>
<tr>
<td>ES 324</td>
<td>*ASIAN PACIFIC AMERICAN LITERATURE</td>
<td></td>
</tr>
<tr>
<td>ES 345</td>
<td>NATIVE AMERICANS IN OREGON</td>
<td></td>
</tr>
<tr>
<td>ES 350</td>
<td>*PUBLIC DISCOURSE AND WRITINGS ON RACE</td>
<td></td>
</tr>
<tr>
<td>ES 351</td>
<td>*ETHNIC MINORITIES IN OREGON</td>
<td></td>
</tr>
<tr>
<td>ES 353</td>
<td>*ENVIRONMENTAL RACISM</td>
<td></td>
</tr>
<tr>
<td>ES 354</td>
<td>*LITERATURE OF ETHNIC MINORITIES IN THE UNITED STATES</td>
<td></td>
</tr>
<tr>
<td>ES 355</td>
<td>*RACE, SPACE, AND DIFFERENCE</td>
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<tr>
<td>ES 357</td>
<td>*FARMWORKER JUSTICE MOVEMENTS</td>
<td></td>
</tr>
<tr>
<td>ES 375/WS 375/WGSS 375</td>
<td>*ARTS AND SOCIAL JUSTICE</td>
<td></td>
</tr>
<tr>
<td>ES 399</td>
<td>SPECIAL TOPICS</td>
<td></td>
</tr>
<tr>
<td>ES 431/WS 431/WGSS 431</td>
<td>*QUEER OF COLOR CRITIQUES</td>
<td></td>
</tr>
<tr>
<td>ES 437</td>
<td>*(EN)GENDERING ASIAN PACIFIC AMERICA</td>
<td></td>
</tr>
<tr>
<td>ES 444</td>
<td>NATIVE AMERICAN LAW. TRIBES, TREATIES, AND THE UNITED STATES</td>
<td></td>
</tr>
<tr>
<td>ES 445</td>
<td>*NATIVE AMERICAN SCIENCE AND TECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>ES 448/PHIL 448/REL 448</td>
<td>NATIVE AMERICAN PHILOSOPHIES</td>
<td></td>
</tr>
<tr>
<td>ES 451</td>
<td>THEORIES OF RACE AND ETHNICITY</td>
<td></td>
</tr>
<tr>
<td>ES 452</td>
<td>*ETHNICITY IN FILM</td>
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</tr>
<tr>
<td>ES 453</td>
<td>*ETHNOHISTORY METHODOLOGY</td>
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<tr>
<td>ES 457</td>
<td>*LITERATURE BY WOMEN OF COLOR IN THE UNITED STATES</td>
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<tr>
<td>ES 458</td>
<td>RACIAL PATTERNS OF URBANIZATION</td>
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<tr>
<td>ES 459/ANTH 459/WLC 459</td>
<td>LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY</td>
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<tr>
<td>ES 460</td>
<td>ETHNICITY AND SOCIAL JUSTICE</td>
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<tr>
<td>ES 461</td>
<td>RACISM AND THE PRISON INDUSTRIAL COMPLEX</td>
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<tr>
<td>ES 464/CSJ 464</td>
<td>FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY</td>
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<tr>
<td>ES 472/QS 472/WGSS 472</td>
<td>NATIVE AMERICANS IN THE UNITED STATES</td>
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<tr>
<td>ES 477/QS 477/WGSS 477</td>
<td>QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM</td>
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<tr>
<td>ES 499</td>
<td>SPECIAL TOPICS</td>
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</tbody>
</table>

Total Hours: 28-30

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 A grade point average of 2.0 and a grade of C- or above in all minor course work is required

Minor Code: 894
Ethnic Studies Undergraduate Major (BA, BS, HBA, HBS)

Ethnic Studies is an interdisciplinary field critically engaging the historical and ongoing impact of race and ethnicity primarily in the US but within a global context. A major in Ethnic Studies provides students with a strong background and set of analytical skills to address issues of difference and inequality in a wide range of areas, from state policy and institutions to pop culture, media, and literature.

Major Code: 894

<table>
<thead>
<tr>
<th>Code</th>
<th>Major Core Title</th>
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</thead>
<tbody>
<tr>
<td>ES 101</td>
<td>*INTRODUCTION TO ETHNIC STUDIES</td>
<td>3</td>
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<td>ES 201</td>
<td>*INVENTING ETHNIC AMERICA</td>
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<td>ES 350</td>
<td>*PUBLIC DISCOURSE AND WRITINGS ON RACE</td>
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<td>ES 451</td>
<td>THEORIES OF RACE AND ETHNICITY</td>
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Ethnic Studies 200-level Courses

Select three of the following: 12

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>ES 211</td>
<td>*INTRODUCTION TO LATINO/A STUDIES</td>
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<td>ES 213</td>
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<td>*SURVEY OF AFRICAN AMERICAN STUDIES I</td>
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<tr>
<td>ES 223</td>
<td>*SURVEY OF AFRICAN AMERICAN STUDIES II</td>
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<tr>
<td>ES 231</td>
<td>*INTRODUCTION TO ASIAN AMERICAN STUDIES</td>
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<tr>
<td>ES 233</td>
<td>*ASIAN PACIFIC AMERICAN ACTIVISM AND EMPOWERMENT</td>
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<td>*INTRODUCTION TO NATIVE AMERICAN STUDIES</td>
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<td>ES 243</td>
<td>*NATIVE AMERICAN ASSIMILATION AND ACTIVISM</td>
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</table>

Ethnic Studies Upper-Division Elective Courses

Select six courses for 22-24 credits of the following with at least three courses at 400 level: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ES 311</td>
<td>NARRATIVES OF LATINO MIGRATIONS</td>
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<tr>
<td>ES 321</td>
<td>AFRICAN AMERICAN POLITICAL AND SOCIAL THOUGHT: 20TH CENTURY</td>
</tr>
<tr>
<td>ES 332</td>
<td>CONTEMPORARY AFRICAN AMERICAN SOCIAL DISCOURSE</td>
</tr>
<tr>
<td>ES 333</td>
<td>ASIAN PacIFIC AMERICANS AND THE MEDIA</td>
</tr>
<tr>
<td>ES 334</td>
<td>*ASIAN PACIFIC AMERICAN LITERATURE</td>
</tr>
<tr>
<td>ES 345</td>
<td>NATIVE AMERICANS IN OREGON</td>
</tr>
<tr>
<td>ES 351</td>
<td>*ETHNIC MINORITIES IN OREGON</td>
</tr>
<tr>
<td>ES 353</td>
<td>*ENVIRONMENTAL RACISM</td>
</tr>
<tr>
<td>ES 355</td>
<td>*RACE, SPACE, AND DIFFERENCE</td>
</tr>
<tr>
<td>ES 357</td>
<td>*FARMWORKER JUSTICE MOVEMENTS</td>
</tr>
<tr>
<td>ES 375/WS 375</td>
<td>*ARTS AND SOCIAL JUSTICE</td>
</tr>
<tr>
<td>WS 375</td>
<td>*ARTS AND SOCIAL JUSTICE</td>
</tr>
<tr>
<td>ES 399</td>
<td>SPECIAL TOPICS</td>
</tr>
<tr>
<td>ES 431/WS 431</td>
<td>*QUEER OF COLOR CRITIQUES</td>
</tr>
<tr>
<td>WS 431</td>
<td>*QUEER OF COLOR CRITIQUES</td>
</tr>
<tr>
<td>ES 437</td>
<td>*ENGENDERING ASIAN PACIFIC AMERICA</td>
</tr>
<tr>
<td>ES 444</td>
<td>NATIVE AMERICAN LAW: TRIBES, TREATIES, AND THE UNITED STATES</td>
</tr>
<tr>
<td>ES 445</td>
<td>*NATIVE AMERICAN SCIENCE AND TECHNOLOGY</td>
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<tr>
<td>ES 448/PHL 448</td>
<td>NATIVE AMERICAN PHILOSOPHIES</td>
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<tr>
<td>REL 448</td>
<td>*ETHNICITY IN FILM</td>
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<tr>
<td>ES 452</td>
<td>*ETHNICITY IN FILM</td>
</tr>
<tr>
<td>ES 453</td>
<td>*ETHNICITY IN FILM</td>
</tr>
<tr>
<td>ES 457</td>
<td>LITERATURE OF WOMEN OF COLOR IN THE UNITED STATES</td>
</tr>
<tr>
<td>ES 458</td>
<td>RACIAL PATTERNS OF URBANIZATION</td>
</tr>
</tbody>
</table>

Food in Culture and Social Justice Certificate

Also available via Ecampus.

Food is more than simple nourishment. It is part of a system of communication firmly rooted in individual and group identities within cultures around the world. When and how we eat, what is considered acceptable to eat, how we prepare it, and how we learn about producing and eating food are all fascinating questions to explore by humanists and social scientists. Histories of particular food commodities and changes in the way people think about sustaining healthy bodies richly contextualize our present practices. Cultural analyses of food and food production lead us to question the level of social justice within the local and global food systems. Community food security is a condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice. Students who complete this certificate will not only have a clear idea of the cultural bases of food and food production but will obtain some experience working towards community food security.

Certificate Code: C315

Complete 16 credits of core classes and then choose 6 credits of electives within the College of Liberal Arts and 6 credits of electives from outside the College of Liberal Arts.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCSJ 361/ANTH 361</td>
<td>*FOOD JUSTICE</td>
</tr>
<tr>
<td>FCSJ 406</td>
<td>FOOD PROJECTS</td>
</tr>
<tr>
<td>FCSJ 464/ES 464</td>
<td>FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY</td>
</tr>
<tr>
<td>FCSJ 467</td>
<td>CAPSTONE: FOOD IN CULTURE AND SOCIAL JUSTICE</td>
</tr>
<tr>
<td>HST 416</td>
<td>*FOOD IN WORLD HISTORY</td>
</tr>
</tbody>
</table>

Select 6 credits from the following: 1

1 With prior written ES faculty approval, students may elect to include 4–8 credits of ES 403, ES 406, or ES 410, in lieu of one or two 300-level upper division elective courses.

A grade-point average of 2.0 is required and majors must earn a grade of C- or above in all major courses.

Major Code: 894
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 439</td>
<td>ARCHAEOLOGY OF FORAGERS</td>
<td></td>
</tr>
<tr>
<td>ANTH 471</td>
<td>CASH, CLASS AND CULTURE: HUNTER-GATHERERS TO CAPITALISM</td>
<td></td>
</tr>
<tr>
<td>ANTH 482</td>
<td>*ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>ES 448/PHL 448/REL 448</td>
<td>NATIVE AMERICAN PHILOSOPHIES</td>
<td></td>
</tr>
<tr>
<td>FCSJ 261/ANTH 261</td>
<td>*FOOD IN AMERICAN CULTURE</td>
<td></td>
</tr>
<tr>
<td>FCSJ 422</td>
<td>INTERCULTURAL LEARNING COMMUNITY</td>
<td></td>
</tr>
<tr>
<td>FCSJ 444/ANTH 444</td>
<td>NUTRITIONAL ANTHROPOLOGY</td>
<td></td>
</tr>
<tr>
<td>FCSJ 454</td>
<td>*INTERNATIONAL PERSPECTIVES ON FOOD SYSTEMS (Ecampus only)</td>
<td></td>
</tr>
<tr>
<td>FCSJ 486/ANTH 486</td>
<td>ANTHROPOLOGY OF FOOD</td>
<td></td>
</tr>
<tr>
<td>PHL 440</td>
<td>*ENVIRONMENTAL ETHICS</td>
<td></td>
</tr>
<tr>
<td>PS 470</td>
<td>GLOBAL FOOD POLITICS AND POLICY (Ecampus only)</td>
<td></td>
</tr>
<tr>
<td>SOC 426</td>
<td>*SOCIAL INEQUALITY</td>
<td></td>
</tr>
<tr>
<td>WGSS 465/PSY 465</td>
<td>WOMEN, WEIGHT, AND BODY IMAGE (Ecampus only)</td>
<td></td>
</tr>
<tr>
<td>WGSS 466/PSY 466</td>
<td>*FAT STUDIES (Ecampus only)</td>
<td></td>
</tr>
<tr>
<td>WR 383</td>
<td>FOOD WRITING</td>
<td></td>
</tr>
</tbody>
</table>

**Electives from Outside the College of Liberal Arts**

Select 6 credits from the following: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 301</td>
<td>*ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS</td>
<td></td>
</tr>
<tr>
<td>AEC 461</td>
<td>*AGRICULTURAL AND FOOD POLICY ISSUES</td>
<td></td>
</tr>
<tr>
<td>ANS 251</td>
<td>PRINCIPLES OF ANIMAL FOODS TECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>ANS 315</td>
<td>*CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE</td>
<td></td>
</tr>
<tr>
<td>CROP 200</td>
<td>CROP ECOLOGY AND MORPHOLOGY</td>
<td></td>
</tr>
<tr>
<td>CROP 330</td>
<td>*WORLD FOOD CROPS</td>
<td></td>
</tr>
<tr>
<td>CROP 340</td>
<td>*PENS AND FLOWS: WRITINGS OF WORKING THE LAND</td>
<td></td>
</tr>
<tr>
<td>CSS 205</td>
<td>*SOIL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>FES 435/TOX 435</td>
<td>*GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK</td>
<td></td>
</tr>
<tr>
<td>FST 210</td>
<td>FRUIT AND VEGETABLE PROCESSING</td>
<td></td>
</tr>
<tr>
<td>FST 212</td>
<td>DAIRY PROCESSING</td>
<td></td>
</tr>
<tr>
<td>FST 260</td>
<td>*FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE</td>
<td></td>
</tr>
<tr>
<td>FST 273</td>
<td>WINE IN THE WESTERN WORLD</td>
<td></td>
</tr>
<tr>
<td>FST 360</td>
<td>FOOD SAFETY AND SANITATION</td>
<td></td>
</tr>
<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
<td></td>
</tr>
<tr>
<td>GEOG 300</td>
<td>*SUSTAINABILITY FOR THE COMMON GOOD</td>
<td></td>
</tr>
<tr>
<td>H 477</td>
<td>DIETARY INTERVENTIONS FOR PUBLIC HEALTH</td>
<td></td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td></td>
</tr>
<tr>
<td>HORT 112</td>
<td>INTRODUCTION TO HORTICULTURAL SYSTEMS, PRACTICES AND CAREERS</td>
<td></td>
</tr>
<tr>
<td>HORT 260</td>
<td>ORGANIC FARMING AND GARDENING</td>
<td></td>
</tr>
<tr>
<td>HORT 300/CROP 300</td>
<td>CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS</td>
<td></td>
</tr>
<tr>
<td>HORT 452</td>
<td>BERRY AND GRAPE PHYSIOLOGY AND CULTURE</td>
<td></td>
</tr>
<tr>
<td>NUTR 216</td>
<td>*FOOD IN NON-WESTERN CULTURE</td>
<td></td>
</tr>
<tr>
<td>NUTR 416</td>
<td>*CULTURAL ASPECTS OF FOODS</td>
<td></td>
</tr>
<tr>
<td>NUTR 417</td>
<td>HUMAN NUTRITION SCIENCE</td>
<td></td>
</tr>
<tr>
<td>NUTR 423</td>
<td>COMMUNITY NUTRITION</td>
<td></td>
</tr>
<tr>
<td>NUTR 446</td>
<td>MANAGING FOOD AND NUTRITION SERVICES</td>
<td></td>
</tr>
<tr>
<td>SUS 350</td>
<td>*SUSTAINABLE COMMUNITIES</td>
<td></td>
</tr>
<tr>
<td>TOX 429</td>
<td>TOXIC SUBSTANCES IN FOOD</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 28

1 Appropriate courses through the College and outside the College of Liberal Arts, as well as transfer credits, may also be used to satisfy requirements when approved in advance by the program coordinator.

**Certificate Code:** C315

### Food in Culture and Social Justice Graduate Minor

This interdisciplinary graduate minor in Food in Culture and Social Justice prepares students to examine food from a variety of perspectives. When and how we eat, what is considered acceptable to eat, how we prepare it, and how we learn about producing and eating food are all fascinating questions to explore by humanists and social scientists. Histories of particular food commodities and changes in the way people think about sustaining healthy bodies richly contextualize our present practices. Cultural analyses of food and food production lead us to question the level of social justice within the local and global food systems.

**Minor Code:** 4260

Students complete at least 1 credit of experiential/service learning which will be spent volunteering with food-related organizations.

**Required Service Learning**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCSJ 506</td>
<td>FOOD PROJECTS</td>
<td>1</td>
</tr>
</tbody>
</table>

**Required Core**

Select 15 credits (master’s) or 18 credits (PhD) of the following: 15-18

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 511</td>
<td>INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL</td>
<td></td>
</tr>
<tr>
<td>FCSJ 544/ANTH 544</td>
<td>NUTRITIONAL ANTHROPOLOGY</td>
<td></td>
</tr>
<tr>
<td>FCSJ 547/ANTH 547</td>
<td>METHODS IN FOOD IN CULTURE AND SOCIAL JUSTICE</td>
<td></td>
</tr>
<tr>
<td>FCSJ 564/ES 564</td>
<td>FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY</td>
<td></td>
</tr>
<tr>
<td>FCSJ 567/ANTH 567</td>
<td>AGRI-FOOD MOVEMENTS</td>
<td></td>
</tr>
<tr>
<td>FCSJ 586/ANTH 586</td>
<td>ANTHROPOLOGY OF FOOD</td>
<td></td>
</tr>
<tr>
<td>HDF 547</td>
<td>FAMILIES AND POVERTY</td>
<td></td>
</tr>
<tr>
<td>HST 516</td>
<td>FOOD IN WORLD HISTORY</td>
<td></td>
</tr>
</tbody>
</table>

Substitutions subject to approval of minor professor

**Minor Code:** 4260

### Foreign Languages and Literatures Graduate Minor

**Graduate Areas of Concentration**

Modern languages, French, German, Spanish

**Minor Code:** 8950

**Minor Code:** 8950

### French Minor

Also available via Ecampus.

**Minor Code:** 925
All prospective majors and minors must see a World Languages and Cultures advisor at least once a year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR 211</td>
<td>SECOND-YEAR FRENCH</td>
<td>12</td>
</tr>
<tr>
<td>&amp; FR 212</td>
<td>and SECOND-YEAR FRENCH</td>
<td></td>
</tr>
<tr>
<td>&amp; FR 213</td>
<td>and SECOND-YEAR FRENCH</td>
<td></td>
</tr>
<tr>
<td>FR 311</td>
<td>THIRD-YEAR FRENCH</td>
<td>6</td>
</tr>
<tr>
<td>&amp; FR 312</td>
<td>and THIRD-YEAR FRENCH</td>
<td></td>
</tr>
<tr>
<td>FR 313</td>
<td>THIRD-YEAR FRENCH</td>
<td>3</td>
</tr>
<tr>
<td>or FR 315</td>
<td>FRENCH FOR BUSINESS</td>
<td></td>
</tr>
<tr>
<td>FR 333</td>
<td>*FRENCH CULTURE AND SOCIETY SINCE THE REVOLUTION</td>
<td>3</td>
</tr>
<tr>
<td>FR 339</td>
<td>FRENCH: FRANCOPHONE STUDIES</td>
<td>3</td>
</tr>
</tbody>
</table>

French electives selected from WLC 230 and upper-division courses as approved by the minor advisor.

Total Hours: 30

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Minor Code: 925

French Undergraduate Major (BA, HBA)

Also available via Ecampus.

Major Code: 925

All prospective majors must see a World Languages and Cultures advisor at least once a year.

The minimum upper-division course requirements are listed below. Additional requirements are available from departmental advisors and the departmental office. Required courses may not be taken S/U.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baccalaureate Core Select 51 credits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

French

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR 311</td>
<td>THIRD-YEAR FRENCH</td>
<td>9</td>
</tr>
<tr>
<td>&amp; FR 312</td>
<td>and THIRD-YEAR FRENCH</td>
<td></td>
</tr>
<tr>
<td>&amp; FR 313</td>
<td>and THIRD-YEAR FRENCH</td>
<td></td>
</tr>
<tr>
<td>FR 333</td>
<td>*FRENCH CULTURE AND SOCIETY SINCE THE REVOLUTION</td>
<td>3</td>
</tr>
<tr>
<td>FR 339</td>
<td>FRENCH: FRANCOPHONE STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>FR 340</td>
<td>INTRODUCTION TO FRENCH LITERARY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>FR 411</td>
<td>FOURTH-YEAR FRENCH</td>
<td>3</td>
</tr>
<tr>
<td>FR 439</td>
<td>*FRENCH: FRANCOPHONE STUDIES</td>
<td>3</td>
</tr>
</tbody>
</table>

French electives selected from WLC 230 and upper-division courses as approved by the major advisor.

Total credits required for graduation: 180

1 These courses must be completed with a B average.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Language majors must participate in a pre-approved study abroad program or internship experience in a country where their language of study is spoken.

Students who do not find a program that fits their academic needs or whose ability to travel is restricted may submit a petition for modification of this requirement to a World Languages and Cultures program advisor.

Major Code: 925

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>PAC 102</td>
<td>AQUA AEROBICS (or any PAC course)</td>
<td>1</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>2</td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>ANTH 101</td>
<td>*INTRODUCTION TO ANTHROPOLOGY (or other Bacc Core Pers/Soc Proc &amp; Inst course)</td>
<td>3</td>
</tr>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING (or other Bacc Core Speech course)</td>
<td>3</td>
</tr>
<tr>
<td>ES 101</td>
<td>*INTRODUCTION TO ETHNIC STUDIES (or other Bacc Core Pers/Cultural Diversity course)</td>
<td>3</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>PAC 102</td>
<td>AQUA AEROBICS (or any PAC course)</td>
<td>1</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>2</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA ( or other Bacc Core Mathematics course )</td>
<td>4</td>
</tr>
<tr>
<td>PG 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS (or other CLA core Social Science course)</td>
<td>4</td>
</tr>
<tr>
<td>WR 201</td>
<td>*WRITING FOR MEDIA (or other Bacc Core Writing II course )</td>
<td>3</td>
</tr>
<tr>
<td>Second Year Fall</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>ART 100</td>
<td>ART ORIENTATION (or other Bacc Core Literature and the Arts course)</td>
<td>1</td>
</tr>
<tr>
<td>BI 101</td>
<td>*ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE ( or other Bacc Core Biological Science course)</td>
<td>4</td>
</tr>
<tr>
<td>FR 311</td>
<td>THIRD-YEAR FRENCH</td>
<td>3</td>
</tr>
<tr>
<td>MUS 101</td>
<td>*MUSIC APPRECIATION I: SURVEY ( or other CLA Core Fine Arts course)</td>
<td>3</td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>FILM 110</td>
<td>*INTRODUCTION TO FILM STUDIES: 1895-1945 (or other Bacc Core Pers/West Culture course)</td>
<td>3</td>
</tr>
<tr>
<td>FR 312</td>
<td>THIRD-YEAR FRENCH</td>
<td>3</td>
</tr>
<tr>
<td>GED 102</td>
<td>*PHYSICAL GEOGRAPHY ( or other Bacc Core Physical Science course)</td>
<td>4</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>BOT 101</td>
<td>*BOTANY A HUMAN CONCERN (or other Bacc Core Lab Science course)</td>
<td>4</td>
</tr>
<tr>
<td>ES 159</td>
<td>*LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION (or other Bacc Core Pers/DPD course)</td>
<td>4</td>
</tr>
<tr>
<td>FR 313</td>
<td>THIRD-YEAR FRENCH</td>
<td>3</td>
</tr>
<tr>
<td>Third Year Fall</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>ANTH 380</td>
<td>*CULTURES IN CONFLICT (or other Bacc Core Contemporary Global Issues course (3))</td>
<td>3</td>
</tr>
<tr>
<td>FR 339</td>
<td>FRENCH: FRANCOPHONE STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>MUS 108</td>
<td>*MUSIC CULTURES OF THE WORLD ( or other CLA core Nonwestern Culture course (3))</td>
<td>3</td>
</tr>
<tr>
<td>WLC 230</td>
<td>*FRANCE TODAY CULTURES WITHIN AND BEYOND ITS BORDERS</td>
<td>3</td>
</tr>
</tbody>
</table>

1 These courses must be completed with a B average.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)
## German Minor

**Also available via Ecampus.**

**Minor Code: 930**

Students who test out of lower level language courses (First-Year or Second-Year) need to make up these credits with additional GER electives. A minimum of 27 credits must be taken in GER overall to earn the minor, 12 of which have to be at the upper-division level.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GER 111 &amp; GER 112 &amp; GER 113</td>
<td>FIRST-YEAR GERMAN and FIRST-YEAR GERMAN and FIRST-YEAR GERMAN</td>
<td>12</td>
</tr>
<tr>
<td>GER 211 &amp; GER 212 &amp; GER 213</td>
<td>SECOND-YEAR GERMAN and SECOND-YEAR GERMAN and SECOND-YEAR GERMAN</td>
<td>12</td>
</tr>
<tr>
<td>GER 311 &amp; GER 312 &amp; GER 313</td>
<td>THIRD-YEAR GERMAN and THIRD-YEAR GERMAN and THIRD-YEAR GERMAN</td>
<td>9</td>
</tr>
</tbody>
</table>

Any upper-division course with a GER subject code

Total Hours 36

## German Undergraduate Major (BA, HBA)

**Also available via Ecampus.**

Individualized development of German language proficiency and intercultural competence via intensive content-based language learning following the Common European Framework of Reference for Languages.

**Major Code: 930**

## Global Development Studies Minor

“Development” refers to the expansion of economic activity, integration into global flows of information and commerce, and improvement of the quality of life. The undergraduate minor program in Global Development Studies at OSU is designed to help students understand the challenges faced by developing communities and countries, including economic inequality, poverty, health and wellness, and the sustainable use of natural resources. Emphasis is placed on interdisciplinary and practical solutions to international development problems.

Courses address both thematic and regional dimensions of international development. Some required and elective courses may also count toward fulfillment of baccalaureate core requirements in categories such as ‘Contemporary Global Issues,’ “Cultural Diversity,” “Science, Technology and Society,” and “Social Processes and Institutions.” Courses will be offered on campus, with the potential for some instruction via Ecampus. Students will be encouraged to participate in research projects, international experiences, and applied work (e.g., internships, service learning, etc.).

**Minor Code: 711**

Students putting together a program of study in Global Development Studies should consult their academic advisor. Students are required to take a minimum of 27 credits, as follows.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 482</td>
<td>*ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT</td>
<td>6</td>
</tr>
<tr>
<td>ECON 455</td>
<td>ECONOMIC DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>GEOG 330</td>
<td>**GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
<td></td>
</tr>
<tr>
<td>PS 345</td>
<td>*POLITICS OF DEVELOPING NATIONS</td>
<td></td>
</tr>
</tbody>
</table>

Regional Focus

Select two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 311</td>
<td>*PEOPLES OF THE WORLD-NORTH AMERICA</td>
<td>6</td>
</tr>
<tr>
<td>ANTH 312</td>
<td>*PEOPLES OF THE WORLD-EUROPE</td>
<td></td>
</tr>
<tr>
<td>ANTH 313</td>
<td>*PEOPLES OF THE WORLD-LATIN AMERICA</td>
<td></td>
</tr>
<tr>
<td>ANTH 314</td>
<td>*PEOPLES OF THE WORLD-MIDDLE EAST</td>
<td></td>
</tr>
</tbody>
</table>
ANTH 315 *PEOPLES OF THE WORLD-AFRICA
ANTH 316 *PEOPLES OF THE WORLD-SOUTH AND SOUTHEAST ASIA
ANTH 317 *PEOPLES OF THE WORLD-PACIFIC
ANTH 318 *PEOPLES OF THE WORLD-CHINA
ANTH 319 *PEOPLES OF THE WORLD-JAPAN AND KOREA
GEOG 311 *GEOGRAPHY OF AFRICA
GEOG 313 *GEOGRAPHY OF ASIA
GEOG 314 *GEOGRAPHY OF LATIN AMERICA
HST 320 *ANCIENT NEAR EAST
HST 350/REL 350 or HST 351 *MODERN LATIN AMERICA
HST 381 & HST 382 *HISTORY OF AFRICA AND *HISTORY OF ASIA
HST 392 *MODERN CHINA AND JAPAN
PS 344 *LATIN AMERICAN POLITICS
PS 346 *MIDDLE EAST POLITICS
PS 348 *CHINESE POLITICS
PS 350 *JAPANESE POLITICS

Thematic/Topical Focus
Select four or five courses from the following:

**ANTH 374 *ANTHROPOLOGY AND GLOBAL HEALTH
ANTH 466 *RURAL ANTHROPOLOGY
ANTH 481 *NATURAL RESOURCES AND COMMUNITY VALUES
COMM 326 INTERCULTURAL COMMUNICATION
COMM 440 THEORIES OF CONFLICT AND CONFLICT MANAGEMENT
CROP 330 *WORLD FOOD CROPS
GEOG 240 *CLIMATE CHANGE, WATER AND SOCIETY
GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
GEOG 330 **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION
GEOG 331 *POPULATION, CONSUMPTION, AND ENVIRONMENT
GEOG 431 *GEOGRAPHY OF FOOD AND AGRICULTURE
GEOG 432 *GEOGRAPHY OF FOOD AND AGRICULTURE
H 333 *GLOBAL PUBLIC HEALTH
HDFS 447 *FAMILIES AND POVERTY
HEST 310 *INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN
HEST 411 ENGINEERING DESIGN FOR EMERGENCY & LOW-RESOURCE ENVIRONMENTS
HEST 412 *MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY
PHL 443/REL 443 *WORLD VIEWS AND ENVIRONMENTAL VALUES
PS 205 *INTRODUCTION TO INTERNATIONAL RELATIONS
PS 458 *INTERNATIONAL POLITICAL ECONOMY
SOC 381 SOCIAL DIMENSIONS OF SUSTAINABILITY
SOC 460 THE SOCIOLOGY OF GLOBALIZATION
SOC 481 *SOCIETY AND NATURAL RESOURCES
SUS 102 *INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY
WGSS 280 *WOMEN WORLDWIDE
WGSS 373/ES 373/ANTH 373/WLC 373 APPROACHES TO SOCIAL JUSTICE
WGSS 480 *GENDER AND TRANSNATIONAL ACTIVISMS

Experiential, International or Service-Learning
Select 0-3 credits *

Total Hours 27-30

* Baccalaureate Core Course (BCC). You can double count courses for your BCC requirement and your certificate requirement

** Highly encouraged, but not required. Students may fulfill this by taking credits in any discipline listed above involving experiential learning, international exchange, or service learning (eg. ANTH 409, ANTH 410). The OSU Center for Civic Engagement can also help connect students with opportunities

Minor Code: 711

Language in Culture Certificate

The interdisciplinary Language in Culture undergraduate certificate provides students who have an interest in language diversity and linguistics the opportunity and skills to deepen their knowledge of the structure and power of languages.

Certificate Code: C700

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Core</td>
<td></td>
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<tr>
<td>ANTH 251 *LANGUAGE IN THE USA or LING 251 *LANGUAGES OF OREGON</td>
<td>3</td>
<td></td>
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<tr>
<td>ANTH 350 *LANGUAGE, CULTURE AND SOCIETY</td>
<td>4</td>
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<tr>
<td>ES 459/WLC 459/ANTH 459 *LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY</td>
<td>4</td>
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<tr>
<td>LING 451 *GENERAL LINGUISTICS</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Languages 1</td>
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<tr>
<td>Electives 2</td>
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<tr>
<td>Select 13 credits from at least two courses below:</td>
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<tr>
<td>ANTH 208/LING 208 *WESTERN CULTURE STUDY ABROAD</td>
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<tr>
<td>ANTH 209/LING 209 *CULTURAL DIVERSITY STUDY ABROAD</td>
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<tr>
<td>ANTH 450 TOPICS IN LINGUISTIC ANTHROPOLOGY</td>
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<tr>
<td>ANTH 452 FOLKLORE AND EXPRESSIVE CULTURE</td>
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<tr>
<td>ANTH 487 LANGUAGE IN GLOBAL CONTEXT</td>
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<td>ANTH 498 ORAL NARRATIVE</td>
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<tr>
<td>COMM 326 INTERCULTURAL COMMUNICATION</td>
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<tr>
<td>COMM 416 ETHNOGRAPHY OF COMMUNICATION</td>
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<tr>
<td>COMM 426 INTERCULTURAL COMMUNICATION: THEORIES AND ISSUES</td>
<td></td>
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<tr>
<td>COMM 427 CULTURAL CODES IN COMMUNICATION</td>
<td></td>
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<tr>
<td>ED 479 LINGUISTICS FOR TEACHERS</td>
<td></td>
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<tr>
<td>ENG 490 HISTORY OF THE ENGLISH LANGUAGE</td>
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<tr>
<td>GER 351 GERMAN PRONUNCIATION AND PHONETICS</td>
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<tr>
<td>PSY 458 LANGUAGE ACQUISITION</td>
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<tr>
<td>PH 331 *SOUND, HEARING, AND MUSIC</td>
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<tr>
<td>SPAN 350 PHONETICS AND PRONUNCIATION</td>
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<tr>
<td>SPAN 351 HISPANIC LINGUISTICS</td>
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<tr>
<td>WLC 301 *INTRODUCTION TO WORLD LANGUAGE AND CULTURE STUDIES</td>
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<td>WLC 345</td>
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<tr>
<td>WLC 366</td>
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<tr>
<td>Total Hours 27</td>
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</tbody>
</table>
1 To develop a sense of linguistic diversity, certificate students must study two languages other than English. End-of-second-year proficiency is required in one language and end-of-first-year proficiency in another language. One of these languages must be outside the Indo-European language family. Students should work with a Language in Culture advisor to identify an appropriate mode of assessment. It is highly recommended that students participate in a study abroad program.

2 Some electives used for the certificate may have prerequisites.

Certificate Code: C700

Latin American Affairs Certificate

Juan A. Trujillo, Director
36 Kidder Hall
Oregon State University
Corvallis, OR 97331-4603
541-737-3956
Email: jtrujillo@oregonstate.edu

Students earning a Latin American Affairs certificate will have gained a broad knowledge and understanding of the history and current situation in Latin America. The program allows students with majors in any discipline to complement their professional studies; certificates are awarded concurrently with the undergraduate or graduate degree.

Course work is drawn from several departments and schools, primarily in the College of Liberal Arts. Interested students should contact the program director early in their academic careers in order to plan their schedules.

Certificate Code: C810

Queer Studies Graduate Minor

The graduate minor in Queer Studies prepares students to examine how gender and sexuality are constructed and policed and, further, imagines liberatory futures for people of all genders and sexualities. Centering itself on the activism and scholarship of women of color, transnational feminisms, Two-Spirit Indigenous people, and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) people of color, this graduate option examines homophobia and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of power.

Minor Code: 8777

Master’s students must complete a total of 20 credits, and doctoral students must complete a total of 24 credits. Students whose primary area is WGSS may use required course work for their program towards an MA or PhD minor in Queer Studies.

Gain:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>HST 350</td>
<td>*MODERN LATIN AMERICA</td>
<td>8</td>
</tr>
<tr>
<td>&amp; HST 351</td>
<td>and *MODERN LATIN AMERICA</td>
<td></td>
</tr>
<tr>
<td>SPAN 336</td>
<td>*LATIN AMERICAN CULTURE</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives 1

Select a minimum of 21 credits of approved Latin American courses outside the major from at least two departments/schools from the following:

- ANTH 313  *PEOPLES OF THE WORLD-LATIN AMERICA
- ES 311   NARRATIVES OF LATINO MIGRATIONS
- GEOG 314  *GEOGRAPHY OF LATIN AMERICA
- HST 452  MODERN MEXICO
- HST 456  PROBLEMS IN LATIN AMERICAN HISTORY
- PHIL 316  INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS
- PS 344   *LATIN AMERICAN POLITICS
- SPAN 311  ADVANCED SPANISH GRAMMAR
- SPAN 312  INTERMEDIATE WRITING SKILLS
- SPAN 313  SPANISH LANGUAGE THROUGH CULTURE
  or SPAN 314  THIRD-YEAR SPANISH FOR NATIVE SPEAKERS
  or SPAN 315  THIRD-YEAR SPANISH FOR NATIVE SPEAKERS
  or SPAN 316  THIRD-YEAR SPANISH FOR NATIVE SPEAKERS
- SPAN 337  *LATIN AMERICAN CULTURE
- SPAN 338  *LATIN AMERICAN CULTURE

Certificate Code: C810

Queer Studies Graduate Minor

The graduate minor in Queer Studies prepares students to examine how gender and sexuality are constructed and policed and, further, imagines liberatory futures for people of all genders and sexualities. Centering itself on the activism and scholarship of women of color, transnational feminisms, Two-Spirit Indigenous people, and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) people of color, this graduate option examines homophobia and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of power.

Minor Code: 8777

Master’s students must complete a total of 20 credits, and doctoral students must complete a total of 24 credits. Students whose primary area is WGSS may use required course work for their program towards an MA or PhD minor in Queer Studies.

Gain:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>QS 562/WGSS 562</td>
<td>QUEER THEORIES</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives

From each of the following areas, Masters students select 8 credits and doctoral students select 8 credits and an additional 4 credits from either area:

Sexuality, Gender, Race, and Nation

- QS 531/WGSS 531/ES 531  QUEER OF COLOR CRITIQUES
- QS 572/ES 572/WGSS 572  INDIGENOUS TWO-SPIRIT AND QUEER STUDIES
- QS 576/WGSS 576  TRANSGENDER LIVES
- QS 577/ES 577/WGSS 577  QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM
- QS 599  SPECIAL TOPICS IN QUEER STUDIES

WGSS 569/SPAN 569/ES 569  TOPICS IN JOTERIA STUDIES

Gender Politics

- QS 524/WGSS 524  TRANS/GENDER POLITICS
- QS 573/WGSS 573  TRANSGENDER LIVES
- QS 599  SPECIAL TOPICS IN QUEER STUDIES
- WS 514  SYSTEMS OF OPPRESSION: STRATEGIES FOR RESISTANCE
- WS 560  SEXUALITIES, FEMINISMS, WOMEN
- WS 585  TRANSGENDER LIVES
- WS 616  MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS

Total Hours 20-24

Minor Code: 8777
Queer Studies Minor

Also available via Ecampus.

The undergraduate minor in Queer Studies prepares students to examine how gender and sexuality are constructed and policed, and further, imagines liberatory futures for people of all genders and sexualities. Centering itself on the activism and scholarship of women of color, transnational feminisms, Two-Spirit Indigenous people, and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) people of color, this minor examines homophobia and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of power.

Minor Code: 877

A total of 33 credits is required for the minor, with at least 12 of these credits at the upper-division level.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Required Core</strong></td>
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</tr>
<tr>
<td>QS 262/WGSS 262</td>
<td>*INTRODUCTION TO QUEER STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>QS 364/WGSS 364</td>
<td>*TRANSITIONAL POLITICS</td>
<td>3</td>
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<tr>
<td>QS 409</td>
<td>PRACTICUM: PROJECTS IN QUEER STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>QS 431/WGSS 431/ES 431</td>
<td>*QUEER OF COLOR CRITIQUES</td>
<td>4</td>
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<tr>
<td>QS 462/WGSS 462</td>
<td>*QUEER THEORIES</td>
<td>4</td>
</tr>
<tr>
<td>QS 472/WGSS 472/ES 472</td>
<td>*INDIGENOUS TWO-SPIRIT AND QUEER STUDIES</td>
<td>4</td>
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<tr>
<td>QS 476/WGSS 476</td>
<td>*TRANSNATIONAL SEXUALITIES</td>
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<tr>
<td><strong>Electives</strong></td>
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<tr>
<td>Select 8 credits from the following:</td>
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<tr>
<td>ART 432/QS 432/ WGSS 432</td>
<td>*GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE</td>
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<tr>
<td>HST 368</td>
<td>*LESBIAN AND GAY MOVEMENTS IN MODERN AMERICA</td>
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<tr>
<td>QS 299</td>
<td>SPECIAL TOPICS</td>
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<tr>
<td>QS 362/WGSS 362</td>
<td>*SERVING LGBTQ+ COMMUNITIES</td>
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<tr>
<td>QS 375/WGSS 375/ES 375</td>
<td>*ARTS AND SOCIAL JUSTICE</td>
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<tr>
<td>QS 399</td>
<td>SPECIAL TOPICS IN QUEER STUDIES</td>
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<tr>
<td>QS 409</td>
<td>PRACTICUM: PROJECTS IN QUEER STUDIES</td>
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<tr>
<td>QS 473/WGSS 473</td>
<td>TRANSGENER LIVES</td>
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<tr>
<td>QS 477/WGSS 477/ES 477</td>
<td>QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM</td>
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<tr>
<td>QS 499</td>
<td>SPECIAL TOPICS IN QUEER STUDIES</td>
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<tr>
<td>WS 360</td>
<td>WOMEN OF COLOR ARTS AND ACTIVISM</td>
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<tr>
<td>WS 430</td>
<td>WOMEN OF COLOR FEMINISMS</td>
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<tr>
<td>WS 460</td>
<td>*SEXUALITIES, FEMINISMS, WOMEN</td>
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<tr>
<td>WS 466/Psy 466</td>
<td>*FAT STUDIES</td>
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<tr>
<td>WS 480</td>
<td>*GENDER AND TRANSNATIONAL ACTIVISMS</td>
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</tbody>
</table>

Total Hours: 33

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

1 The remaining 8 credits may be taken from the Queer Studies electives (any course with the QS prefix) and from approved program courses offered by other departments.

Minor Code: 877

Social Justice Minor

The Social Justice minor provides interdisciplinary academic classes in which students think critically about social justice and experiential learning activities in which students engage in the work of social justice. The program addresses local, national and international issues of social justice. A core of theory, case studies, and practice is combined with elective courses from across the College of Liberal Arts that address the following areas: histories, cultures and geographies of dominance; experiences of oppression; theories of justice; policies, institutions, and structures that promote or hinder equity; and collective action or processes of change leading to social justice.

The Social Justice minor is a collaboration of the School of Language, Culture, and Society, the School of History, Philosophy, and Religion, and the School of Public Policy.

Minor Code: 271

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Required Courses</strong></td>
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</tr>
<tr>
<td>ANTH 373/ES 373/ WGSS 373/WLC 373</td>
<td>APPROACHES TO SOCIAL JUSTICE</td>
<td>3</td>
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<tr>
<td>ANTH 410/ES 410/ WGSS 410/WLC 410</td>
<td>INTERNSHIP (3 of active internship, 1 of critical discussion about internship)</td>
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<tr>
<td>ANTH 485/ES 485/ WGSS 485/WLC 485</td>
<td>CAPSTONE IN SOCIAL JUSTICE</td>
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<td><strong>Electives</strong></td>
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<tr>
<td>Select 18 credits from the following three areas:</td>
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<tr>
<td><strong>Theories and Perspectives</strong></td>
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<tr>
<td>ANTH 345</td>
<td>*BIological and CULTURAl CONSTRUCTIONs of RACE</td>
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<tr>
<td>ES 451</td>
<td>THEORIES OF RACE and ETHNICITY</td>
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<tr>
<td>ES 460</td>
<td>ETHNICITY AND SOCIAL JUSTICE</td>
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<tr>
<td>PHL 160</td>
<td>QUESTS FOR MEANING: WORLD RELIGIONS</td>
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<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
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<tr>
<td>PHL 207</td>
<td>*POLITICAL PHILOSOPHY</td>
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<tr>
<td>PHL 220</td>
<td>*WORLD-VIEWS and VALUES in the BIBLE</td>
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<tr>
<td>PHL 315</td>
<td>*GANDHI and NONVIOLENCE</td>
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<tr>
<td>PHL 344</td>
<td>*PACIFISM, just WAR, and TERRORISM</td>
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<tr>
<td>PHL 365</td>
<td>*LAW in PHILOSOPHICAL PERSPECTIVE</td>
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<tr>
<td>PHL 431</td>
<td>BUDDHISM, NON-VIOLENCE, and SOCIAL JUSTICE</td>
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<tr>
<td>PHL 444</td>
<td>*BIOMEDICAL ETHICS</td>
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<tr>
<td>PAX 201</td>
<td>STUDY OF PEACE and THE CAUSES of CONFLICT</td>
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<tr>
<td>PS 206</td>
<td>INTRODUCTION TO POLITICAL THOUGHT</td>
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<tr>
<td>PS 322</td>
<td>CONSTITUTIONAL LAW: CIVIL RIGHTS and LIBERTIES</td>
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<tr>
<td>PS 361</td>
<td>CLASSICAL POLITICAL THOUGHT</td>
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<td>PS 362</td>
<td>MODERN POLITICAL THOUGHT</td>
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<tr>
<td>PS 363</td>
<td>*GENDER and RACE in AMERICAN POLITICAL THOUGHT</td>
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<tr>
<td>PS 461</td>
<td>ENVIRONMENTAL POLITICAL THEORY</td>
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<td>PS 462</td>
<td>THEORIES OF LAW</td>
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</tr>
<tr>
<td>WS 462/WGSS 462</td>
<td>*QUEER THEORIES</td>
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<tr>
<td>WS 416</td>
<td>THEORIES OF FEMINISM</td>
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<tr>
<td><strong>History, Cultures, Experiences of Oppression; Collective Movements</strong></td>
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<tr>
<td>ANTH 315</td>
<td>*PEOPLES of the WORLD-AFRICA</td>
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<tr>
<td>ANTH 468</td>
<td>ANTHROPOLOGY of CHILDHOOD</td>
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<tr>
<td>ANTH 473</td>
<td>*GENDER, ETHNICITY and CULTURE</td>
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<tr>
<td>ANTH 481</td>
<td>*NATURAL RESOURCES and COMMUNITY VALUES</td>
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<td>ANTH 484</td>
<td>*WEALTH and POVERTY</td>
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<tr>
<td>ENG 220/FILM 220</td>
<td>*TOPICS in DIFFERENCE, POWER, and DISCRIMINATION</td>
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<td>FR 339</td>
<td>FRENCH: FRANCOPHONE STUDIES</td>
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<tr>
<td>HST 368</td>
<td>*LESBIAN and GAY MOVEMENTS IN MODERN AMERICA</td>
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<tr>
<td>HST 425</td>
<td>*THE HOLOCAUST IN ITS HISTORY</td>
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<tr>
<td>QS 262/WGSS 262</td>
<td>*INTRODUCTION to QUEER STUDIES</td>
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<tr>
<td>QS 431/WGSS 431</td>
<td>*QUEER of COLOR CRITIQUES</td>
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<td>QS 472/ES 472/WGSS 472</td>
<td>*INDIGENOUS TWO-SPIRIT and QUEER STUDIES</td>
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<tr>
<td>SOC 471</td>
<td>*SOCIAL MOVEMENTS</td>
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</table>
Spanish Minor

Also available via Ecampus.

**Minor Code:** 940

All prospective majors and minors must see a departmental advisor at least once a year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SPAN 211</td>
<td>SECOND-YEAR SPANISH</td>
<td>12</td>
</tr>
<tr>
<td>&amp; SPAN 212</td>
<td>and SECOND-YEAR SPANISH</td>
<td></td>
</tr>
<tr>
<td>&amp; SPAN 213</td>
<td>and SECOND-YEAR SPANISH</td>
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<tr>
<td>SPAN 311</td>
<td>ADVANCED SPANISH GRAMMAR</td>
<td>3</td>
</tr>
<tr>
<td>or SPAN 314</td>
<td>THIRD-YEAR SPANISH FOR NATIVE SPEAKERS</td>
<td></td>
</tr>
</tbody>
</table>
While core coursework taught by the Women, Gender, and Sexuality Studies Program is required, students are expected to take the bulk of their elective coursework from approved Women, Gender, and Sexuality Studies Program classes offered throughout the different academic units on campus. A total of 27 credits is required for the certificate, with at least 12 of these credits at the upper-division level.

All required coursework must be taken on campus and no more than 3 credits of online elective course work can be used toward the on-campus certificate.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGSS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WGSS 410</td>
<td>INTERNSHIP ²</td>
<td>3</td>
</tr>
<tr>
<td>WGSS 414</td>
<td>*SYSTEMS OF OPPRESSION IN WOMEN'S LIVES</td>
<td>4</td>
</tr>
</tbody>
</table>

**Electives**

Select 17 credits ¹,²

Total Hours 27

¹ Baccalaureate Core Course (BCC)

The remaining 17 credits can be taken from elective courses offered by the Women, Gender, and Sexuality Studies (WGSS) Program and from approved program courses offered in any school/department at OSU. However, at least 12 of these 17 credits must consist of approved program courses. An approved program course is one that has a focus on gender and/or women’s issues, is taught in a unit other than the WGSS Program, and has been approved as fulfilling the requirements of a WGSS Program course. See the electives for the WGSS major

² No more than 3 credits of WGSS 402 and WGSS 410 may count toward the certificate.

Certificate Code: C808

**Women, Gender, and Sexuality Studies Graduate Major (MA, PhD)**

**Graduate Areas of Concentration**

Feminist leadership; gender, rhetoric, and representation; health and gender justice; social justice theory and practice

**Major Code: 8008**

MA students will take 42-43 credits of course work, including 21 credits of required courses and thesis credit. In addition, students select two courses from cluster area one, one course from each of cluster areas two and three, and 6 elective credit chosen from any of the cluster areas and/or other WGSS/QS elective courses. Cluster areas include:

1. Women of Color Feminisms/Queer of Color Feminisms
2. Global/Transnational Feminisms
3. Feminist Praxis

MA students must also demonstrate second-year proficiency in a second language.

PhD students will take 27–28 credits of core requirements, as well as 36 dissertation credits, and 12 credits of electives in a concentration specific to their area of focus, for a total of 75–76 required credits. No more than two ‘slash’ courses will be accepted toward the degree.

**MA in Women, Gender, and Sexuality Studies**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGSS 503</td>
<td>THESIS</td>
<td>6</td>
</tr>
<tr>
<td>WGSS 511</td>
<td>ORIENTATION AND PROFESSIONALIZATION I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; WGSS 512</td>
<td>and ORIENTATION AND PROFESSIONALIZATION II</td>
<td></td>
</tr>
<tr>
<td>&amp; WGSS 513</td>
<td>and ORIENTATION AND PROFESSIONALIZATION III</td>
<td></td>
</tr>
<tr>
<td>WGSS 514</td>
<td>SYSTEMS OF OPPRESSION: STRATEGIES FOR RESISTANCE</td>
<td>4</td>
</tr>
<tr>
<td>WGSS 516</td>
<td>THEORIES OF FEMINISM</td>
<td>4</td>
</tr>
<tr>
<td>WGSS 518</td>
<td>FEMINIST RESEARCH</td>
<td>4</td>
</tr>
</tbody>
</table>

**Cluster Electives ³**

<table>
<thead>
<tr>
<th>Cluster #1: Women of Color Feminisms/Queer of Color Feminisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGSS 530</td>
</tr>
<tr>
<td>WGSS 531/ES 531</td>
</tr>
<tr>
<td>Q5 531</td>
</tr>
<tr>
<td>WGSS 575/ES 575</td>
</tr>
<tr>
<td>JURISPRUDENCE</td>
</tr>
<tr>
<td>WGSS 577/ES 577</td>
</tr>
<tr>
<td>Q5 577</td>
</tr>
<tr>
<td>WGSS 583</td>
</tr>
</tbody>
</table>

**Cluster #2: Global/Transnational Feminisms**

| WGSS 572/ES 572/ | INDIGENOUS TWO-SPirit AND QUEER STUDIES                       |       |
| Q5 572 |                                                           |       |
| WGSS 576/QS 576 | TRANSNATIONAL SEXUALITIES                                    |       |
| WGSS 582 | GLOBAL PERSPECTIVES ON WOMEN'S HEALTH                        |       |
| WGSS 585 | TRANSNATIONAL FEMINISANS                                     |       |
| WGSS 595 | GLOBAL FEMINIST THEOLOGIES                                   |       |

**Cluster #3: Feminist Praxis**

| WGSS 510 | INTERNSHIP                                                 |       |
| WGSS 521 | FEMINIST LEADERSHIP                                        |       |
| WGSS 535 | FEMINIST TEACHING AND LEARNING                              |       |
| WGSS 542/GRAD/ | THE INCLUSIVE CLASSROOM: DIFFERENCE, POWER AND   |       |
| DISCRIMINATION | 542                                                     |       |
| WGSS 586 | GLOBAL EXPERIENCE I                                        |       |
| & WGSS 587/ | and GLOBAL EXPERIENCE II                                  |       |
| & WGSS 588 | and GLOBAL EXPERIENCE III                                 |       |

**Electives**

Students must also complete at least 6 elective credits from any of the cluster areas and/or other WGSS/QS elective courses in order to meet the 42-43 minimum credit total.

Total Hours 42-43

³ All MA students must also take at least two courses from cluster one, Women of Color Feminisms/Queer of Color Feminisms, and at least one course each from the remaining clusters, Global/Transnational Feminisms and Feminist Praxis. WGSS 586/587/588 Global Experience I, II, III together constitute the equivalent of one 3-credit class within the Feminist Praxis cluster. Students must also complete an additional 6 elective credits chosen from any of the cluster areas and/or other WGSS/QS elective courses.

**Second-year proficiency in a second language as demonstrated by:**

1. Two years of a college language sequence on the transcript.
2. Scoring at second-year proficiency on a language placement test.
3. Completing the 213 course of a language sequence while enrolled in the MA program.
PhD in Women, Gender, and Sexuality Studies

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS 518</td>
<td>FEMINIST RESEARCH ¹</td>
<td>4</td>
</tr>
<tr>
<td>or WGS 619</td>
<td>DECOLONIZING METHODS</td>
<td></td>
</tr>
<tr>
<td>or WGS 555</td>
<td>FEMINIST TEXTUAL AND DISCOURSE ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>WGS 521</td>
<td>FEMINIST LEADERSHIP ²</td>
<td>4</td>
</tr>
<tr>
<td>WGS 535</td>
<td>FEMINIST TEACHING AND LEARNING</td>
<td>3-4</td>
</tr>
<tr>
<td>or WGS 542</td>
<td>THE INCLUSIVE CLASSROOM: DIFFERENCE, POWER AND DISCRIMINATION</td>
<td></td>
</tr>
<tr>
<td>or GRAD 542</td>
<td>THE INCLUSIVE CLASSROOM: DIFFERENCE, POWER AND DISCRIMINATION</td>
<td></td>
</tr>
<tr>
<td>WGS 611</td>
<td>COLLOQUIUM ³</td>
<td>4</td>
</tr>
<tr>
<td>WGS 616</td>
<td>MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS I</td>
<td>4</td>
</tr>
<tr>
<td>WGS 617</td>
<td>MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS II</td>
<td>4</td>
</tr>
<tr>
<td>WGS 620</td>
<td>SOCIAL JUSTICE THEORY AND PRACTICE</td>
<td>4</td>
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</tbody>
</table>

Thesis

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>WGS 603</td>
<td>THESIS</td>
<td>36</td>
</tr>
</tbody>
</table>

Electives

Select 12 credits ⁴

Total Hours 75-76

¹ Students who have already taken WGS 518 and WGS 555 at OSU may take WGS 619 or another approved methods course.

² Students who have already taken WGS 521 at OSU will take WGS 610.

³ Students must take 4 terms of colloquium and must present dissertation research once.

⁴ Students may select a concentration in one of the four areas below or may work in consultation with their advisor to develop a 12-credit concentration specific to their needs and interests. Students may also elect to take 12 elective credits from any WGGS graduate courses or other approved courses in any of the graduate concentrations.

Graduate Concentrations

Minimum 12 credits of course work; no more than two of these courses may be "slash" courses.

Feminist Leadership

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>WGS 518</td>
<td>FEMINIST RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>WGS 610</td>
<td>INTERNSHIP (Shadowing)</td>
<td>4</td>
</tr>
</tbody>
</table>

Gender, Rhetoric, and Representation

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 598</td>
<td>WOMEN AND LITERATURE</td>
<td>4</td>
</tr>
<tr>
<td>WGS 555</td>
<td>FEMINIST TEXTUAL AND DISCOURSE ANALYSIS</td>
<td>4</td>
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</tbody>
</table>

Health and Gender Justice

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS 518</td>
<td>FEMINIST RESEARCH</td>
<td>4</td>
</tr>
</tbody>
</table>

Social Justice Theory and Practice

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS 582</td>
<td>GLOBAL PERSPECTIVES ON WOMENS HEALTH</td>
<td>4</td>
</tr>
<tr>
<td>WGS 583</td>
<td>RACE, GENDER, AND HEALTH JUSTICE</td>
<td>4</td>
</tr>
</tbody>
</table>

Major Code: 8008

Women, Gender, and Sexuality Studies Graduate Minor

Graduate Areas of Concentration

Contemporary women’s issues; leadership and community engagement; race, class and gender; sexuality studies; transnational perspectives

Women, Gender, and Sexuality Studies is the multidisciplinary study of gender and women’s lives and experiences. Course work explores women’s realities in such areas as the political and social sciences, health, psychology, history, literature, and the arts. Women, Gender, and Sexuality Studies programs grew out of the women’s movement, involving understandings of discrimination in society and a need to celebrate different women’s strengths, contributions, and forms of resistance.

Women, Gender, and Sexuality Studies can be elected as a primary and/or secondary field for the Master of Arts in Interdisciplinary Studies degree (MAIS) and as a graduate minor. Areas of specialization include contemporary women’s issues; gender, race and class; and global women’s issues. The master’s program requires a thesis or research report (nonthesis option) and the completion of a core curriculum. This curriculum includes an understanding of how issues of gender, race, class, and other differences among women affect their status in Western and global perspectives. It also emphasizes the relationship between theory and strategies for social change. An internship or field placement in an agency that is concerned with gender issues or women’s role and status in society is required and is designed to help students integrate classroom knowledge with practical experience. The graduate program is beneficial for any work experience in which gender is negotiated or women are affected. Women, Gender, and Sexuality Studies graduates are employed in human service agencies and programs, advocacy organizations such as battered women’s shelters and women’s resource centers and community organizing, teaching, business, administration, and cultural work. Many students have used their degree as a preparatory base for doctoral work.

Women, Gender, and Sexuality Studies faculty are drawn from colleges across the university. Many teach Women, Gender, and Sexuality Studies program courses in their home departments and are involved in research projects that give them different perspectives on the challenges in Women, Gender, and Sexuality Studies. These courses and faculty are not listed in this entry.

For more information, contact Patti Duncan, Director, Women, Gender, and Sexuality Studies, 252 Waldo Hall, OSU, Corvallis, OR 97331.

Minor Code: 9008
Minor Code: 9008

Women, Gender, and Sexuality Studies Minor

Also available via Ecampus.

The Women, Gender, and Sexuality Studies minor provides a multidisciplinary exploration of gender and sexuality as they intersect with race, ethnicity, class, culture, nation, and ability. The curriculum incorporates a social activism component, and students are encouraged to consider the ways knowledge and activist engagements help promote social justice in local and global communities.

Minor Code: 908

Students are expected to take the bulk of their coursework toward the minor from the core and elective courses offered by the Women, Gender, and Sexuality Studies Program.

A total of 27 credits is required for the minor, with at least 12 credits at the upper-division level.

All required coursework must be taken on campus and no more than 3 credits of online elective course work can be used toward the on-campus minor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCSS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WCSS 262</td>
<td>*INTRODUCTION TO QUEER STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WCSS 319</td>
<td>*FEMINIST DECOLONIZING METHODOLOGIES: SOCIAL JUSTICE RESEARCH</td>
<td>3</td>
</tr>
<tr>
<td>WCSS 414</td>
<td>*SYSTEMS OF OPPRESSION IN WOMEN'S LIVES</td>
<td>4</td>
</tr>
<tr>
<td>WCSS 416</td>
<td>THEORIES OF FEMINISM</td>
<td>4</td>
</tr>
<tr>
<td>WCSS 480</td>
<td>*GENDER AND TRANSGENDER ACTIVISMS</td>
<td>3</td>
</tr>
</tbody>
</table>

All required coursework for the on-campus major must be taken on campus and no more than 6 credits of online elective course work can be used toward the on-campus major.

Total credits required for graduation is 180.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCSS 223</td>
<td>*INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WCSS 262</td>
<td>*INTRODUCTION TO QUEER STUDIES</td>
<td>3</td>
</tr>
<tr>
<td>WCSS 319</td>
<td>*FEMINIST DECOLONIZING METHODOLOGIES: SOCIAL JUSTICE RESEARCH</td>
<td>3</td>
</tr>
<tr>
<td>WCSS 414</td>
<td>*SYSTEMS OF OPPRESSION IN WOMEN'S LIVES</td>
<td>4</td>
</tr>
<tr>
<td>WCSS 416</td>
<td>THEORIES OF FEMINISM</td>
<td>4</td>
</tr>
<tr>
<td>WCSS 480</td>
<td>*GENDER AND TRANSGENDER ACTIVISMS</td>
<td>3</td>
</tr>
</tbody>
</table>

All required coursework for the on-campus major must be taken on campus and no more than 6 credits of online elective course work can be used toward the on-campus major.

Total credits required for graduation is 180.
### WGSS Major Requirements

**Core**

- **WGSS 223** *INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY* 3
- **WGSS 262/QS 262** *INTRODUCTION TO QUEER STUDIES* 3
- **WGSS 319** *FEMINIST DECOLONIZING METHODOLOGIES: SOCIAL JUSTICE RESEARCH* 3
- **WGSS 410** INTERNSHIP 3
- **WGSS 414** *SYSTEMS OF OPPRESSION IN WOMEN'S LIVES* 4
- **WGSS 416** *THEORIES OF FEMINISM* 4
- **WGSS 480** *GENDER AND TRANSNATIONAL ACTIVISMS* 3
- **WGSS 498** FEMINIST PRACTICE 4

**Electives**

- **WGSS 110** *GENDER, RACE, AND POP CULTURE*
- **WGSS 111** *FEMINIST PERSPECTIVES ON CURRENT EVENTS*
- **WGSS 224** *WOMEN: PERSONAL AND SOCIAL CHANGE*
- **WGSS 230** *WOMEN IN THE MOVIES*
- **WGSS 235** *WOMEN IN WORLD CINEMA*
- **WGSS 240** *GENDER AND SPORT*
- **WGSS 270** *RESISTING GENDER VIOLENCE*
- **WGSS 280** *WOMEN WORLDWIDE*
- **WGSS 295** *FEMINISM AND THE BIBLE*
- **WGSS 299** SPECIAL STUDIES
- **WGSS 311** *GLOBAL EXPERIENCE: CULTURAL DIVERSITY*
- **WGSS 312** *GLOBAL EXPERIENCE: WESTERN CULTURE*
- **WGSS 313** *GLOB EXPER: CONTEMP GLOB ISSU*
- **WGSS 320** *GENDER AND TECHNOLOGY*
- **WGSS 321/QS 321** *QUEER POP CULTURE*
- **WGSS 324** *FEMINIST ACTIVISMS*
- **WGSS 325** *DISNEY: GENDER, RACE, EMPIRE*
- **WGSS 340** *GENDER AND SCIENCE*
- **WGSS 350** *POLITICS OF MOTHERHOOD IN A GLOBAL CONTEXT*
- **WGSS 360** *MEN AND MASCULINITIES IN A GLOBAL CONTEXT*
- **WGSS 361/ES 361/ QS 361** *(RE)FRAMING RACE THROUGH FILM PRODUCTION*
- **WGSS 362/QS 362** *SERVING LGBTQ+ COMMUNITIES*
- **WGSS 364/QS 364** *TRANSGERDER POLITICS*
- **WGSS 373/ANTH 373/ES 373/QS 373** *APPROACHES TO SOCIAL JUSTICE*
- **WGSS 375/ES 375/ QS 375** *ARTS AND SOCIAL JUSTICE*
- **WGSS 378/REL 378** *RELIGION AND GENDER: A GLOBAL PERSPECTIVE*
- **WGSS 380** *MUSLIM WOMEN*
- **WGSS 399** TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES
- **WGSS 402** INDEPENDENT STUDY
- **WGSS 406** PROJECTS
- **WGSS 417/PHL 417** FEMINIST PHILOSOPHIES
- **WGSS 418** FEMINIST RESEARCH METHODS
- **WGSS 430** WOMEN OF COLOR FEMINISMS
- **WGSS 431/ES 431/QS 431** *QUEER OF COLOR CRITIQUES*
- **WGSS 432/ART 432/QS 432** *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE*
- **WGSS 440** *WOMEN AND NATURAL RESOURCES*
- **WGSS 450** ECOFEMINISM
- **WGSS 460** *SEXUALITIES, FEMINISMS, WOMEN*
- **WGSS 462/QS 462** *QUEER THEORIES*
- **WGSS 465/PSY 465** WOMEN, WEIGHT, AND BODY IMAGE
- **WGSS 466/PSY 466** *FAT STUDIES*
- **WGSS 472/QS 472** *INDIGENOUS TWO-SPIRIT AND QUEER STUDIES*

<table>
<thead>
<tr>
<th>Program Course Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taught through other departments but approved as WGSS Program Courses</td>
</tr>
<tr>
<td>ANTH 473</td>
</tr>
<tr>
<td>COMM 432</td>
</tr>
<tr>
<td>ENG 362</td>
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<tr>
<td>ENG 416</td>
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<tr>
<td>ENG 497</td>
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<tr>
<td>ENG 498</td>
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<td>ES 437</td>
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<td>ES 457</td>
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<td>HDFS 444</td>
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<td>HDFS 447</td>
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<td>HST 362</td>
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<td>HST 358</td>
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<td>HST 390</td>
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<td>HST 432</td>
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<td>HST 435</td>
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<td>PS 317</td>
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<td>PS 363</td>
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<td>PS 425</td>
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<td>PSY 426</td>
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<td>PSY 456</td>
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<td>SOC 312</td>
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<tr>
<td>SOC 430</td>
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<tr>
<td>SOC 466</td>
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<tr>
<td>SOC 480</td>
</tr>
</tbody>
</table>

**Total Hours**: 180

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1. **College of Liberal Arts BA/BS Requirements**:
   - The BA requires second year language proficiency at the college level with a C grade or better.
   - The BS requires 15 credits in science, computer science, and quantitative studies.

2. **With the exception of WIC, courses used to satisfy requirements for the major may not be used to meet baccalaureate or liberal arts core requirements.**

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Major Code: 808**

### School of Psychological Science

The psychology curriculum explores scientific approaches to a wide range of psychological phenomena. Courses meet the needs of students...
desiring a knowledge of psychology as part of their general education or professional background, planning to secure entry-level jobs in human services occupations, or preparing for graduate study in psychology or related fields. The school offers a major program leading to a BA or BS degree in Psychology, a minor program for undergraduate students with majors in other disciplines, and a PhD program.

Graduates with Bachelor's degrees in psychology often find entry-level career positions in human services, law enforcement, business, education, management, sales, and also may go on to graduate study in such fields as psychology, counseling, social work, public and business administration, and law.

**Undergraduate Programs**

**Major**
- Psychology (p. 762)

**Minor**
- Contemplative Studies (p. 759)
- Psychology (p. 761)

**Graduate Programs**

**Major**
- Psychology (p. 760)

**Minor**
- Psychology (p. 761)

**Faculty**

**Professors:** Bernieri, Edwards, Gurung, Lien, McCarley  
**Associate Professors:** Becker Blease, Bogart, Kerr, Sanchez, Sherman, Wolsko  
**Assistant Professors:** Cservenka, Dermody, Macuga  
**Senior Instructors:** Hu  
**Instructors:** Almuaybid, Brown, Connor-Smith, Dilts, Hu, Kleronomos, McCullough, O'Laughlin, O'Hanlon, Yax

**PSY 199. SPECIAL TOPICS. (1-16 Credits)**  
*This course is repeatable for 16 credits.*

**PSY 201. *GENERAL PSYCHOLOGY. (3 Credits)**  
Scientific study of behavior and experience. Biological bases of behavior; sensation and perception; conditioning, learning and memory; thinking, problem solving, language, and consciousness; cognitive, personal and social development. (SS) (Bacc Core Course)  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 202. *GENERAL PSYCHOLOGY. (3 Credits)**  
Motivation and emotion; personality; measurement of human differences; adjustment, psychopathology and psychotherapy; attitudes and social behavior. (SS) (Bacc Core Course)  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 298. QUANTITATIVE METHODS IN PSYCHOLOGICAL SCIENCE. (4 Credits)**  
Foundational course explores quantitative methods in psychological science to prepare students for further study in research methods in psychological science. Topics include descriptive statistics, hypothesis testing, correlation, one-way or two-way ANOVA, regression, controversies and emerging practices in open psychological science.  
**Prerequisites:** PSY 201 with C- or better and (PSY 202 [C-] or PSY 202H [C-]) and MTH 105 [C-] and ST 201 [C-] and (PHL 121 [C-] or WR 222 [C-] or WR 327 [C-])  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 299. SPECIAL TOPICS. (0-6 Credits)**  
*This course is repeatable for 30 credits.*

**PSY 301. RESEARCH METHODS IN PSYCHOLOGY. (4 Credits)**  
Study of scientific methodology in psychology, including experimental and observational techniques. Topics include problem identification and hypothesis formation, research design, application of statistics, collection and interpretation of data, computer usage, and research report writing. Lec/lab.  
**Prerequisites:** PSY 201 with D- or better and PSY 202 [D-] and (ST 351 [D-] or ST 351H [D-])  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 330. BRAIN AND BEHAVIOR. (4 Credits)**  
Introduction to the relationships of the structure and functioning of the human brain to behavior. Information from neuroanatomy, neurochemistry, neurosurgery and neurology is combined with psychological research on both normal and abnormal human behavior. (SS)  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 340. COGNITION. (4 Credits)**  
Theories, research and applications concerning cognition. Topics include perception, attention, memory, learning, thinking and language. (SS)  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 340H. COGNITION. (4 Credits)**  
Theories, research and applications concerning cognition. Topics include perception, attention, memory, learning, thinking and language.  
**Attributes:** HNRS – Honors Course Designator; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**PSY 350. HUMAN LIFESPAN DEVELOPMENT. (4 Credits)**  
An introduction to physical, social, cognitive and linguistic development with an emphasis on theory and methodology. (SS)  
**Attributes:** CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

**Kathryn Becker Blease, Director**  
2950 SW Jefferson Way, Reed Lodge  
Corvallis, OR 97331-5303  
Phone: 541-737-2311  
Website: http://psychology.oregonstate.edu/

**Assistant to Director:** Shirley Mann  
**Academic Advisors:** Ashleigh Anderson (Head Advisor), Nathan Walters  
**Academic Programs Coordinator:** Nicole Wolf  
**Contemplative Studies Coordinator:** Katelin Gallagher
PSY 360. SOCIAL PSYCHOLOGY. (4 Credits)
The study of behavior and experience in a social context. Topics include person perception, attribution, attraction and love, attitudes and attitude change, aggression, social influence and group dynamics. Applications of social psychological principles to other fields, e.g., law, health care, etc. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 360H

PSY 360H. SOCIAL PSYCHOLOGY. (4 Credits)
The study of behavior and experience in a social context. Topics include person perception, attribution, attraction and love, attitudes and attitude change, aggression and social influence and group dynamics. Applications of social psychological principles to other fields, e.g., law, health care, etc. (SS)
Attributes: HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 360

PSY 370. PERSONALITY. (4 Credits)
An overview of major theories of personality is followed by an introduction to personality testing and research. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 381. ABNORMAL PSYCHOLOGY. (4 Credits)
Survey of various forms of psychological disorders; theories regarding etiology and treatment. Special emphasis on research approaches to such disorders.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 381H

PSY 399. SPECIAL TOPICS. (1-6 Credits)
Equivalent to: PSY 399H
This course is repeatable for 30 credits.

PSY 399H. SPECIAL TOPICS. (1-6 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PSY 399
This course is repeatable for 30 credits.

PSY 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 402. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 406. PROJECTS. (0-16 Credits)
This course is repeatable for 16 credits.

PSY 407. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 408. WORKSHOP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 410. PSYCHOLOGY INTERNSHIP. (1-16 Credits)
Professional experience applying psychological science in a variety of employment settings under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 16 credits.

PSY 426. *PSYCHOLOGY OF GENDER. (4 Credits)
Survey of theories, life cycles and contemporary problems of women and men in a social context. Scientific examination of gender related to psychological functioning and behavior. Topics can include psychological research on human similarities and differences in gender attitudes, relationships, sexuality, violence, employment, and mental health. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: PSY 202 with D- or better

PSY 432. PHYSIOLOGICAL PSYCHOLOGY. (4 Credits)
Basic vertebrate neurophysiology and neuroanatomy in relation to behavior. Neural and hormonal correlates of sensation, learning, memory and motivation.
Prerequisites: PSY 330 with D- or better
Recommended: Biological science background

PSY 433. PSYCHOPHARMACOLOGY. (4 Credits)
Drug-brain-behavior interactions. Psychoactive drugs and their relationships to normal and abnormal behavior in humans.
Recommended: Upper-division standing and biological science background

PSY 434. *BRAIN AND BEHAVIOR METHODS. (4 Credits)
Methodology primarily in the area of neuropsychological research. Topics include the finding and interpretation of background literature, critical evaluation of research, hypothesis formulation, experimental design, data interpretation, reporting of results and methods, and weaving a conclusion and review article. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and PSY 330 [D-]

PSY 437. MOTIVATION. (4 Credits)
Biological, learning, and cognitive approaches to human and animal motivation. Topics include evolution, homeostasis, drive, arousal, incentive motivation, achievement motivation, and social motivation.
Prerequisites: (PSY 330 with D- or better or PSY 340 with D- or better) and PSY 301 [D-]

PSY 440. *COGNITION RESEARCH. (4 Credits)
Advanced scientific methodology primarily in the areas of attention, learning, memory, and thinking. Students will design their own research projects, collect and analyze data, and write a professional report. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]

PSY 442. PERCEPTION. (4 Credits)
Fundamental concepts of animal and human sensation and perception, with emphasis on audition and vision. Applications of psychophysical methods to research in all sensory modalities. Includes review workshops on basic mathematical, physical and psychological concepts necessary to interpret research in this field.
Prerequisites: PSY 301 with D- or better and (PSY 330 [D-] or PSY 340 [D-])

PSY 444. LEARNING AND MEMORY. (4 Credits)
Experimental and theoretical work on learning, conditioning, and memory in animals and humans.
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]
PSY 448. CONSCIOUSNESS. (4 Credits)
Psychological, phenomenological, and physiological approaches to the content and processes of subjective awareness. Topics include philosophical issues, cortical and reticular neurophysiology, sleeping and dreaming, selective attention, imagery, and self-awareness.
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]

PSY 454. COGNITIVE DEVELOPMENT. (4 Credits)
Discusses intellectual development from infancy to adulthood. Topics include the origin of thinking, the development of perception, attention, memory, problem solving, language, academic skills, and social cognition. Piaget, Vygotsky, and information processing approaches will be discussed.
Prerequisites: PSY 350 with D- or better

PSY 456. SOCIAL DEVELOPMENT. (4 Credits)
Covers theories and research concerning human social development. Topics include theories of socialization; the development of social relationships; the self-concept; emotion; sex roles; social cognition; prosocial behavior; morality; self-control; and aggression.
Prerequisites: PSY 350 with D- or better

PSY 458. LANGUAGE ACQUISITION. (4 Credits)
Psychological processes involved in the acquisition and use of language throughout childhood. Biological, cognitive, and social influences on language will be discussed, as well as personal uses of language, such as language in thought and reading.
Prerequisites: PSY 350 with D- or better

PSY 460. *ADVANCED SOCIAL RESEARCH METHODS. (4 Credits)
Advanced experimental research methods in the social sciences. Issues in psychological construct operationalization, experimental design, data collection, analysis, and report writing will be emphasized. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and PSY 360 [D-]

PSY 463. JUDGMENT AND DECISION MAKING. (4 Credits)
Explores ways to improve judgment and decision making through the application of research from cognitive psychology. Emphasis on development of critical thinking skills.
Prerequisites: PSY 340 with D- or better

PSY 464. SOCIAL COGNITION. (4 Credits)
Research and theory concerning cognitive structures and processes underlying social judgment and social behavior. Topics include attribution theory, social inference, person memory, schema-based information processing.
Prerequisites: PSY 360 with D- or better

PSY 465. WOMEN, WEIGHT, AND BODY IMAGE. (4 Credits)
Focuses on women’s increasing struggles with weight, eating disorders, and broader body image issues in contemporary society. Explores how social institutions such as media, medicine, government contribute to weight bias and unhealthy standards for appearance. Examines weightism as a system of oppression that intersects with other systems of oppression including sexism, racism, classism, heterosexism, ableism, and ageism. CROSSLISTED as PSY 465/WGSS 465 and PSY 565.
Equivalent to: WGSS 465

PSY 466. *FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employ a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/PowereDiscrimination
Prerequisites: WGSS 223 with D- or better or WGSS 223H with D- or better or WGSS 224 with D- or better or WGSS 240 with D- or better or WGSS 262 with D- or better or WGSS 262H with D- or better or WGSS 270 with D- or better or WGSS 280 with D- or better or WGSS 280H with D- or better or WGSS 321 with D- or better or WGSS 325 with D- or better or WGSS 32H with D- or better or WGSS 340 with D- or better or WGSS 34H with D- or better or WGSS 350 with D- or better or WGSS 360 with D- or better or WGSS 36H with D- or better or WGSS 364 with D- or better or WGSS 366 with D- or better or WGSS 368 with D- or better or WGSS 380 with D- or better or WGSS 386 with D- or better or WGSS 38H with D- or better
Equivalent to: WGSS 466, WS 466

PSY 467. POLITICAL PSYCHOLOGY. (4 Credits)
Survey of classic and contemporary perspectives in political psychology. Special focus on how citizens form political judgments. Topics include personality, affect, cognition, group influence, voting, nationalism, and political tolerance.
Prerequisites: PSY 360 with D- or better

PSY 468. THE PSYCHOLOGY OF CLOSE RELATIONSHIPS. (4 Credits)
Explores the research and theory on the development, maintenance, and dissolution of human relationships. The course will examine various directions to the study of interpersonal relationships, including attachment, evolutionary-biological, cognition, and interdependence. Topics will also include physical attraction, love, friendship, communication, trust, jealousy, and several issues that are specific to troubled dyadic relations.
Prerequisites: PSY 360 with D- or better

PSY 470. *PSYCHOMETRICS AND PSYCHOLOGICAL TESTING. (4 Credits)
An introduction to psychological measurement is provided with emphasis on the notions of reliability and validity; advanced correlation techniques are introduced. These methods are applied to contemporary tests of personality, aptitude, and achievement. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and (PSY 340 [D-] or PSY 370 [D-] or PSY 380 [D-] or PSY 381 [D-] or PSY 481 [D-])

PSY 480. *CLINICAL RESEARCH METHODS. (4 Credits)
Advanced research methods used in clinical psychology research. Design of studies, assessment, data collection, and interpretation will be discussed. The clinical content area focused on will vary. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and (PSY 380 [D-] or PSY 381 [D-] or PSY 481 [D-])

PSY 482. PSYCHOTHERAPY. (4 Credits)
Survey of the theory, techniques and research on the major contemporary systems of psychotherapy.
Prerequisites: PSY 370 with D- or better or PSY 380 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better
PSY 483. DEVELOPMENTAL PSYCHOPATHOLOGY. (4 Credits)
Developmental perspective on child and adolescent psychological disorders including causal factors, associated features, and research-supported interventions.
Prerequisites: PSY 350 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better

PSY 484. PSYCHOLOGY OF ADDICTION. (4 Credits)
Focuses on the psychological factors in drug and behavioral addictions and associated interventions. The approach will be biopsychosocial, addressing neurobiological, behavioral, psychological, and social factors that influence addiction. Topics will include epidemiology and public health impact, diagnosis, models of addiction, and intervention and treatment approaches.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 220 with C- or better or PSY 301 with C- or better or SOC 315 with C- or better

PSY 485. BEHAVIOR MODIFICATION. (4 Credits)
Review of basics of operant and classical conditioning. Research on behavior modification and behavior therapy with both normal and abnormal animals, human adults, and children. Application areas include behavior problems, handicaps, eating disorders, time management, self-control stress management, contingency contracts, and cognitive therapies.
Prerequisites: PSY 350 with D- or better or PSY 380 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better
Recommended: Background work in family life or education

PSY 486. YOGA AND MENTAL HEALTH. (4 Credits)
Examines the use of yoga in psychological practice with a particular focus on managing mental and physical illnesses.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 492. CONSERVATION PSYCHOLOGY. (4 Credits)
Explores connections between the study of human behavior and the achievement of conservation goals. Understanding how people think about and interact with nature is crucial for promoting environmental sustainability and human well-being. Students will examine theory and research on human cognitive, emotional, and behavioral responses to nature.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 493. POSITIVE PSYCHOLOGY. (4 Credits)
Psychological theory, research, and interventions directed at how humans can flourish and identify and enhance positive strengths. Topics include positive emotional and cognitive states and processes, prosocial behavior, positive school and work environments, and discovering meaning in life.
Prerequisites: PSY 360 with D- or better or PSY 370 with D- or better

PSY 494. ENGINEERING PSYCHOLOGY. (4 Credits)
Survey human capabilities and limitations in human-machine interaction, including vision, memory, attention, motor control, and human error. Emphasis on theory and implications for system designs.
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]

PSY 495. PSYCHOLOGY OF MEDITATION. (4 Credits)
Explores the psychological processes of meditation, and requires regular meditation sessions by students. Readings ranging from traditional Eastern philosophy to empirical psychological research journal articles will focus on outcomes and effective methods of meditation practice.
Prerequisites: PSY 201 with D- or better or PSY 202 with D- or better

PSY 496. INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY. (4 Credits)
Survey of psychological research and theory relevant to organizations, industry, and other work settings. Topics include training, employee selection, performance evaluation, work attitudes, and motivation.
Prerequisites: PSY 360 with D- or better or PSY 370 with D- or better

PSY 497. EVOLUTIONARY PSYCHOLOGY. (4 Credits)
Evolutionary approach to the study of psychology. Focus on psychological mechanisms as evolved traits.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 498. HEALTH PSYCHOLOGY. (4 Credits)
Psychological factors in the maintenance of good health and in the prevention of, treatment of, and recovery from illness: Behavioral contributions to illness, life-style risk factors, stress and the immune system, psychological response to symptoms and care-givers, health habits and self-care, management of pain and chronic illness, disability and terminal illness.
Prerequisites: PSY 330 with D- or better or PSY 340 with D- or better or PSY 350 with D- or better or PSY 360 with D- or better or PSY 370 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better

PSY 499. SPECIAL TOPICS. (1-16 Credits)
Newly emerging or specialized topics that can only be offered occasionally or for particular purposes. Each offering will be structured with a syllabus.
Equivalent to: PSY 422, PSY 499H
This course is repeatable for 30 credits.

PSY 499H. SPECIAL TOPICS. (1-16 Credits)
Newly emerging or specialized topics that can only be offered occasionally or for particular purposes. Each offering will be structured with a syllabus.
Attributes: HNRS – Honors Course Designator
Equivalent to: PSY 499

PSY 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PSY 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 508. WORKSHOP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 510. PSYCHOLOGY INTERNSHIP. (1-16 Credits)
Professional experience applying psychological science in a variety of employment settings under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 16 credits.
PSY 514. RESEARCH METHODS I. (4 Credits)
An introduction to the tools and methods that psychologists use to examine the processes that underlie human behavior. Emphasis is on the skills necessary for completing a research study: hypothesis formulation, design criteria, data collection, analysis, interpretation, write-up, and presentation of results. Utilizes a combination of readings, discussions, and class exercises. Course culminates in an independent research project proposal.
Prerequisites: ST 511 with B- or better

PSY 521. ISSUES IN PROFESSIONAL PSYCHOLOGY. (1 Credit)
Professional development seminar focused on professional issues specific to the field of research-based psychology. Includes writing for publication, professional speaking, professional development and leadership, and current professional and research controversies. Each iteration of the course over the academic year will have a different focus. Graded P/N.
This course is repeatable for 3 credits.

PSY 523. ETHICS IN PSYCHOLOGICAL RESEARCH. (1 Credit)
Covers research ethics in psychology. Topics include the history of research-oriented ethical guidelines, ethical principles, working with an IRB, questionable research practices, and fraud. Meets OSU's Learning Outcome regarding the ethical conduct of research.
Recommended: An undergraduate-level psychological research methods course

PSY 526. PSYCHOLOGY OF GENDER. (4 Credits)
Survey of theories, life cycles and contemporary problems of women and men in a social context. Scientific examination of gender related to psychological functioning and behavior. Topics can include psychological research on human similarities and differences in gender attitudes, relationships, sexuality, violence, employment, and mental health.
Recommended: PSY 202

PSY 531. GRADUATE BEHAVIORAL NEUROSCIENCE. (4 Credits)
Neurobiological underpinnings of behavior examining animal and human research on neural structure and function in relation to typical and atypical behavior, including psychiatric disorders.

PSY 533. PSYCHOPHARMACOLOGY. (4 Credits)
Drug-brain-behavior interactions. Psychoactive drugs and their relationships to normal and abnormal behavior in humans.
Recommended: Biological science background

PSY 534. BRAIN AND BEHAVIOR METHODS. (4 Credits)
Methodology primarily in the area of neuropsychological research. Topics include the finding and interpretation of background literature, critical evaluation of research, hypothesis formulation, experimental design, data interpretation, reporting of results and methods, and weaving a conclusion and review article.
Recommended: PSY 301 and PSY 330

PSY 537. MOTIVATION. (4 Credits)
Biological, learning, and cognitive approaches to human and animal motivation. Topics include evolution, homeostasis, drive, arousal, incentive motivation, achievement motivation, and social motivation.
Recommended: PSY 301 and (PSY 330 or PSY 340)

PSY 540. COGNITION RESEARCH. (4 Credits)
Advanced scientific methodology primarily in the areas of attention, learning, memory, and thinking. Students will design their own research projects, collect and analyze data, and write a professional report.
Recommended: PSY 301 and PSY 340

PSY 541. GRADUATE SEMINAR IN COGNITION. (4 Credits)
Cognitive psychology studies the processes by which human beings notice, encode, remember, and use information. A graduate-level survey that covers the history, methods, important findings, and major theories of the field, with an emphasis on reading and critically analyzing articles from the primary research literature. Topics of interest will include perception and object recognition, attention, working memory, long-term memory, concepts and categorization, and judgment and decision making.

PSY 542. PERCEPTION. (4 Credits)
Fundamental concepts of animal and human sensation and perception, with emphasis on audition and vision. Applications of psychophysical methods to research in all sensory modalities. Includes review workshops on basic mathematical, physical and physiological concepts necessary to interpret research in this field.
Recommended: PSY 301 and (PSY 330 or PSY 340)

PSY 544. LEARNING AND MEMORY. (4 Credits)
Experimental and theoretical work on learning, conditioning, and memory in animals and humans.
Recommended: PSY 301 and PSY 340

PSY 548. CONSCIOUSNESS. (4 Credits)
Psychological, phenomenological, and physiological approaches to the content and processes of subjective awareness. Topics include philosophical issues, cortical and reticular neurophysiology, sleeping and dreaming, selective attention, imagery, and self-awareness.
Recommended: PSY 301 and PSY 340

PSY 551. LIFESPAN DEVELOPMENTAL SCIENCE. (4 Credits)
The study of human change and stability over time. Topics may include, but are not limited to, theories, methodological approaches, and contexts for development, social development, cognitive development, and biopsychosocial processes including temperament and personality, resilience, health, thriving, emotion regulation, and developmental contexts.

PSY 554. COGNITIVE DEVELOPMENT. (4 Credits)
Discusses intellectual development from infancy to adulthood. Topics include the origin of thinking, the development of perception, attention, memory, problem solving, language, academic skills, and social cognition. Piaget, Vygotsky, and information processing approaches will be discussed.
Recommended: PSY 350

PSY 556. SOCIAL DEVELOPMENT. (4 Credits)
Covers theories and research concerning human social development. Topics include theories of socialization, the development of social relationships; the self-concept; emotion; sex roles; social cognition; prosocial behavior; morality; self-control; and aggression.
Recommended: PSY 350

PSY 558. LANGUAGE ACQUISITION. (4 Credits)
Psychological processes involved in the acquisition and use of language throughout childhood. Biological, cognitive, and social influences on language will be discussed, as well as personal uses of language, such as language in thought and reading.
Recommended: PSY 350

PSY 560. ADVANCED SOCIAL RESEARCH METHODS. (4 Credits)
Advanced experimental research methods in the social sciences. Issues in psychological construct operationalization, experimental design, data collection, analysis, and report writing will be emphasized.
Recommended: PSY 301 and PSY 360
PSY 561. GRADUATE SOCIAL PSYCHOLOGY. (4 Credits)
A graduate level survey course of the theories, methods, and empirical findings that constitute the field of social psychology. Topics will include, but not be limited to, person perception, social cognition, attitudes, attitude change, persuasion, interpersonal attraction, relationships, small-group processes, altruism, and aggression.

PSY 564. SOCIAL COGNITION. (4 Credits)
Research and theory concerning cognitive structures and processes underlying social judgment and social behavior. Topics include attribution theory, social inference, person memory, schema-based information processing.
Recommended: PSY 360

PSY 565. WOMEN, WEIGHT, AND BODY IMAGE. (4 Credits)
Focuses on women's increasing struggles with weight, eating disorders, and broader body image issues in contemporary society. Explores how social institutions such as media, medicine, government contribute to weight bias and unhealthy standards for appearance. Examines weightism as a system of oppression that intersects with other systems of oppression including sexism, racism, classism, heterosexism, ableism, and ageism. CROSSLISTED as PSY 465/WGSS 465 and PSY 565.
Equivalent to: WGSS 565

PSY 566. FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Emphasizes a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566.
Equivalent to: WGSS 566, WS 566
Recommended: WGSS 223 or WGSS 223H or WGSS 224 or WGSS 240 or WGSS 262 or WGSS 262H or WGSS 270 or WGSS 280 or WGSS 280H or WGSS 321 or WGSS 325 or WGSS 325H or WGSS 340 or WGSS 340H or WGSS 350 or WGSS 360 or WGSS 360H or WGSS 364 or WGSS 364H or WGSS 373 or WGSS 375 or WGSS 380 or WGSS 380H

PSY 567. POLITICAL PSYCHOLOGY. (4 Credits)
Survey of classic and contemporary perspectives in political psychology. Special focus on how citizens form political judgments. Topics include personality, affect, cognition, group influence, voting, nationalism, and political tolerance.

PSY 570. PSYCHOMETRICS AND PSYCHOLOGICAL TESTING. (4 Credits)
An introduction to psychological measurement is provided, with emphasis on the notions of reliability and validity; advanced correlational techniques are introduced. These methods are applied to contemporary tests of personality, aptitude, and achievement.
Recommended: PSY 301 and (PSY 340 or PSY 370)

PSY 571. GRADUATE PSYCHOMETRICS. (4 Credits)
A graduate level introduction to psychological testing theory and practice, and to ethical, sociopolitical, psychological, and psychometric issues in the use of psychological tests. Particularly emphasizes basic psychometric principles that are important in scale construction, test evaluation, and practical assessment.
Prerequisites: ST 511 with B- or better and ST 512 [B-]

PSY 580. CLINICAL RESEARCH METHODS. (4 Credits)
Advanced research methods used in clinical psychology research. Design of studies, assessment, data collection, and interpretation will be discussed. The clinical content area focused on will vary.
Recommended: PSY 301 and (PSY 380 or PSY 381 or PSY 481)

PSY 581. GRADUATE SEMINAR IN CLINICAL RESEARCH AND THEORY. (4 Credits)
Focuses on major concepts, theory, and empirical findings on the causes and treatment of psychological disorders. The seminar emphasizes culture, context, bias, and stigma, as well as application of principles of clinical science to students' graduate program research agendas.

PSY 582. PSYCHOTHERAPY. (4 Credits)
Survey of the theories, techniques and research on the major contemporary systems of psychotherapy.
Recommended: PSY 370 or PSY 381

PSY 583. DEVELOPMENTAL PSYCHOPATHOLOGY. (4 Credits)
Developmental perspective on child and adolescent psychological disorders including causal factors, associated features, and research-supported interventions.
Recommended: PSY 350 or PSY 381 or PSY 481

PSY 584. PSYCHOLOGY OF ADDICTION. (4 Credits)
Focuses on the psychological factors in drug and behavioral addictions and associated interventions. The approach will be biopsychosocial, addressing neurobiological, behavioral, psychological, and social factors that influence addiction. Topics will include epidemiology and public health impact, diagnosis, models of addiction, and intervention and treatment approaches.

PSY 585. BEHAVIOR MODIFICATION. (4 Credits)
Review of basics of operant and classical conditioning. Research on behavior modification and behavior therapy with both normal and abnormal animals, human adults, and children. Application areas include: behavior problems, handicaps, eating disorders, time management, self-control, stress management, contingency contracts, and cognitive therapies.
Recommended: PSY 350 or equivalent work in family life or education.

PSY 586. YOGA AND MENTAL HEALTH. (4 Credits)
Examines the use of yoga in psychological practice with a particular focus on managing mental and physical illnesses.
Recommended: PSY 201 and PSY 202

PSY 591. GRADUATE SEMINAR IN HEALTH PSYCHOLOGY. (4 Credits)
Covers the theories, methods, and empirical findings that constitute the field of health psychology. Topics include, but are not limited to, the interaction of multiple factors involved in etiology, prevention, treatment, and course of illness and disability; health behavior, health promotion, and health risks; stress and coping in health; long-term care and adaptation to chronic illness or disability; practice of institutional healthcare.

PSY 592. CONSERVATION PSYCHOLOGY. (4 Credits)
Explores connections between the study of human behavior and the achievement of conservation goals. Understanding how people think about and interact with nature is crucial for promoting environmental sustainability and human well-being. Students will examine theory and research on human cognitive, emotional, and behavioral responses to nature.
Recommended: PSY 201 and PSY 202

PSY 593. POSITIVE PSYCHOLOGY. (4 Credits)
Psychological theory, research, and interventions directed at how humans can flourish and identify and enhance positive strengths. Topics include positive emotional and cognitive states and processes, prosocial behavior, positive school and work environments, and discovering meaning in life.
Recommended: PSY 360 or PSY 370
PSY 594. ENGINEERING PSYCHOLOGY. (4 Credits)
Survey human capabilities and limitations in human-machine interaction, including vision, memory, attention, motor control, and human error. Emphasis on theory and implications for system designs.
Recommended: (PSY 301 and PSY 340)

PSY 595. PSYCHOLOGY OF MEDITATION. (4 Credits)
Explores the psychological processes of meditation, and requires regular meditation sessions by students. Readings ranging from traditional Eastern philosophy to empirical psychological research journal articles will focus on outcomes and effective methods of meditation practice.
Recommended: PSY 201 and PSY 202

PSY 596. INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY. (4 Credits)
Survey of psychological research and theory relevant to organizations, industry, and other work settings. Topics include training, employee selection, performance evaluation, work attitudes, and motivation.
Recommended: PSY 360 and PSY 370

PSY 598. HEALTH PSYCHOLOGY. (4 Credits)
Emphasis on theory and implications for system designs.

PSY 599. SPECIAL TOPICS. (1-16 Credits)
Recommended: 300-level course in psychology.

PSY 601. RESEARCH. (1-16 Credits)
Research credits for PhD students in Psychological Science. Graded P/N. This course is repeatable for 99 credits.

PSY 602. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 603. THESIS/DISSERTATION. (1-16 Credits)
Graded P/N. This course is repeatable for 999 credits.

PSY 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 606. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 643. APPLIED COGNITION. (4 Credits)
Surveys a range of applied cognition research in real-world settings, including aviation, driving, business, education, sports, legal practice, and everyday activities.

PSY 649. ADVANCED ENGINEERING PSYCHOLOGY. (4 Credits)
Advanced survey of human information processing and performance in human-technology systems, with emphasis on theory, methodology, and implications for system analysis and design.

PSY 697. GRADUATE PSYCHOLOGICAL SCIENCE OF TEACHING AND LEARNING. (4 Credits)
For graduate students of all majors on the translation of cognitive, social, and developmental psychological science for the practice of university teaching and learning. Topics include memory, attention, metacognition, motivation, interpersonal and developmental processes, and individual differences. Emphasis on critical review of theories and methods, and practical applications for university teaching.

PSY 699. SPECIAL TOPICS. (1-16 Credits)
Special topics for advanced graduate students. Graded A-F. This course is repeatable for 99 credits.

Contemplative Studies Minor

This minor combines courses from several areas to foster an objective understanding of contemplative practices and philosophies by studying them in the context of psychology, philosophy, religion, history, health, and other academic areas. In addition to coursework, Contemplative Studies includes first-person experience with practicing contemplation, adding an increasingly-valued complement to theory-based learning. This approach qualifies as experiential learning, which is an OSU emphasis. A large research literature has shown that contemplative practice has a variety of beneficial effects for people, including enhanced attentional ability, increased compassion, better physical and mental health, and increased personal insight. Other benefits of contemplative practices include cultivating the ability to be resilient in the face of challenges, reducing our experience of stress, and improving relationships.

Contemplative practices are increasingly being used in a variety of professional and work settings, including education, organizational wellness programs, counseling, and many areas of healthcare. Because of this, Contemplative Studies will be a useful minor to add to many disciplines, including Psychology, HDFSciences, BioHealth Sciences, Education, Digital Communication Arts, and others. Business schools at Harvard, Stanford, University of Virginia, and, increasingly, others, value, teach, research, and promote adding studies in contemplation as an important, complementary education and skill set for leadership, productiveness, effectiveness, and well-being of their graduates in preparing them for a career in business and related fields.

Upon completion of a Minor in Contemplative Studies at Oregon State University, you will be able to:

1. Demonstrate effective application of multiple forms of contemplative practice
2. Articulate the research-based benefits of contemplative practice
3. Articulate the connections between contemporary contemplative practices and their historical contexts

Minor Code: 802

A minor in Contemplative Studies can be earned by satisfactorily completing 27 credits from the following list of courses, which must include 12 upper division credits (300 and 400 level courses).

Check with your own college’s policies to see if the same course can count to meet different degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PAC 202</td>
<td>MEDITATION</td>
<td>1</td>
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<tr>
<td>PHL 430/REL 430</td>
<td>HISTORY OF BUDDHIST PHILOSOPHY</td>
<td>4</td>
</tr>
<tr>
<td>PSY 495</td>
<td>PSYCHOLOGY OF MEDITATION</td>
<td>4</td>
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</tbody>
</table>
Select 3 credits from the following: 3

PAC 256 TAIJI, TAI CHI I
PAC 257 TAIJI, TAI CHI II
PAC 293 INTERDISCIPLINARY YOGA
or PAC 293H INTERDISCIPLINARY YOGA
PAC 294 YOGA I
PAC 295 YOGA II
PAC 296 VINYASA YOGA
PAC 297 YOGATHON

Select at least 15 credits from the following: 15

PHL 208/REL 208 INTRODUCTION TO BUDDHIST TRADITIONS
PHL 432/REL 432 *YOGA AND TANTRIC TRADITIONS
PHL 433/REL 433 *THEORY AND PRACTICE OF MODERN YOGA
PHL 434/REL 434 *SPIRITUALITY AND ECOLOGY GREEN YOGA
or REL 434H *SPIRITUALITY AND ECOLOGY GREEN YOGA
PHL 455/REL 455 DEATH AND DYING
PSY 486 YOGA AND MENTAL HEALTH
PSY 448 CONSCIOUSNESS
PSY 493 POSITIVE PSYCHOLOGY
WR 420 STUDIES IN WRITING

Total Hours 27

* Baccalaureate Core Course (BCC)

Minor Code: 802

Psychology Graduate Major (MS, PhD)

Graduate Areas of Concentration

Applied cognition, engineering psychology, health psychology

The MS and Ph.D. program is a doctoral program with a Master’s degree component that is obtained en route to the Ph.D. The MS portion of the program assures that students have experience designing and conducting research prior to the dissertation stage. The program has a strong research component, ensuring that graduates have the tools to tackle a variety of applied problems. This entails both classwork in research methods and statistics and a continuing emphasis on student research.

The program’s general focus is on the application of psychological research methods, theories, and principles to solving practical problems. The program has three areas of concentration: applied cognition, engineering psychology, and health psychology.

Applied cognition is the application of research on thinking, learning, decision-making, perception, social judgment, and other cognitive processes to applied issues. Examples of relevant application areas include the psychology of teaching and learning, the effects of contemplative practice, and risk perception.

Engineering psychology refers to research at the intersection of psychology and technology. Relevant topics include such things as the improvement of technology, human-machine interfaces, transportation, information systems, and work and living environments.

Health psychology concerns the relations between psychological factors (e.g., cognition, motivation, individual and interpersonal behavior, emotion) and physical and mental health and wellness in diverse populations with regard to age, gender, ethnicity, socioeconomic background, and health status.

Admission Requirements

Bachelor’s or Master’s degree from an accredited institution; minimum undergraduate GPA of 3.2/4.0 or graduate GPA of 3.5/4.0; GRE, TOEFL score of at least 600 (paper exam), 250 (computer exam), or 100 (internet exam); three letters of recommendation; personal statement.

Major Code: 9700

The Psychology PhD program requires a minimum of 111 credits, including at least 36 credits of dissertation. The program is organized into core requirements for all students, along with additional work in a concentration area composed of electives, the nature of which is defined primarily by the student’s research focus.

The core requirements are in research methods, professional issues, and basic content in psychology. The required core curriculum provides a critical foundation in quantitative and research methods, core theory in psychological science, ethics, and professional issues.

No more than 15 credits of blanket-numbered classes, excluding dissertation, thesis, or internship credit, may be used towards the 111 credit minimum.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>ST 511</td>
<td>METHODS OF DATA ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>ST 512</td>
<td>METHODS OF DATA ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>ST 513</td>
<td>METHODS OF DATA ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>PSY 514</td>
<td>RESEARCH METHODS I</td>
<td>4</td>
</tr>
<tr>
<td>PSY 571</td>
<td>GRADUATE PSYCHOMETRICS</td>
<td>4</td>
</tr>
<tr>
<td>PSY 521</td>
<td>ISSUES IN PROFESSIONAL PSYCHOLOGY (Take 3 times)</td>
<td>3</td>
</tr>
<tr>
<td>PSY 523</td>
<td>ETHICS IN PSYCHOLOGICAL RESEARCH</td>
<td>1</td>
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<tr>
<td>PSY 531</td>
<td>GRADUATE BEHAVIORAL NEUROSCIENCE</td>
<td></td>
</tr>
<tr>
<td>PSY 541</td>
<td>GRADUATE SEMINAR IN COGNITION</td>
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</tr>
<tr>
<td>PSY 551</td>
<td>LIFESPAN DEVELOPMENTAL SCIENCE</td>
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<tr>
<td>PSY 561</td>
<td>GRADUATE SOCIAL PSYCHOLOGY</td>
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<tr>
<td>PSY 581</td>
<td>GRADUATE SEMINAR IN CLINICAL RESEARCH AND THEORY</td>
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<tr>
<td>PSY 591</td>
<td>GRADUATE SEMINAR IN HEALTH PSYCHOLOGY</td>
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</table>

Basic Content Core

Select three of the following: 12

Concentration Electives

Select six courses for 24 credits of the following: 24

PSY 510  | PSYCHOLOGY INTERNSHIP                                     |       |
PSY 526  | PSYCHOLOGY OF GENDER                                       |       |
PSY 533  | PSYCHOPHARMACOLOGY                                        |       |
PSY 537  | MOTIVATION                                                 |       |
PSY 542  | PERCEPTION                                                 |       |
PSY 544  | LEARNING AND MEMORY                                       |       |
PSY 548  | CONSCIOUSNESS                                              |       |
PSY 554  | COGNITIVE DEVELOPMENT                                      |       |
PSY 556  | SOCIAL DEVELOPMENT                                         |       |
PSY 558  | LANGUAGE ACQUISITION                                       |       |
PSY 564  | SOCIAL COGNITION                                           |       |
PSY 566  | FAT STUDIES                                                |       |
PSY 582  | PSYCHOTHERAPY                                              |       |
PSY 583  | DEVELOPMENTAL PSYCHOPATHOLOGY                             |       |
PSY 585  | BEHAVIOR MODIFICATION                                      |       |
PSY 592  | CONSERVATION PSYCHOLOGY                                    |       |
Major Code: 9700

Psychology Graduate Minor

Graduate Areas of Concentration

*General psychology*

Graduate work in the School of Psychological Science may apply to the Master of Arts in Interdisciplinary Studies degree or to minors in other advanced degree programs.

Minor Code: 9650

Minor Code: 9650

Psychology Minor

Also available at OSU-Cascades, OSU-Portland and via Ecampus.

The School of Psychological Science offers students a variety of educational avenues that provide the necessary tools for competency in, and appreciation for, psychology as a scientific discipline.

Many of our graduates will go straight into the workforce into areas such as human services, human resources, and educational assistants. Many graduates will also continue their education through professional schools such as law, medicine, or optometry. Others will engage in further study in business or in public administration. Some students will continue their study of Psychology at a school with a graduate program in one of the specialties area of psychology.

In addition to classes whose contents span the many sub disciplines of psychology, the School of Psychological Science at Oregon State values the intellectual contributions of its students and offers a number of opportunities for research experience.

Minor Code: 965

Students should consult their major advisors to see if specific courses are required for their major. Students must receive a grade of C– or better in any course applied toward the minor. Such courses cannot be taken with S/U grading.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 201 &amp; PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
<td>6</td>
</tr>
<tr>
<td>Survey</td>
<td>Select two courses from the following:</td>
<td>8</td>
</tr>
<tr>
<td>PSY 330</td>
<td>BRAIN AND BEHAVIOR</td>
<td></td>
</tr>
<tr>
<td>PSY 340</td>
<td>COGNITION</td>
<td></td>
</tr>
<tr>
<td>PSY 350</td>
<td>HUMAN LIFESPAN DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>PSY 360</td>
<td>SOCIAL PSYCHOLOGY</td>
<td></td>
</tr>
<tr>
<td>PSY 370</td>
<td>PERSONALITY</td>
<td></td>
</tr>
<tr>
<td>PSY 381</td>
<td>ABNORMAL PSYCHOLOGY</td>
<td></td>
</tr>
</tbody>
</table>

Advanced/Variable Courses

Select two courses from the following: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PSY 426</td>
<td>*PSYCHOLOGY OF GENDER</td>
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</tr>
<tr>
<td>PSY 432</td>
<td>PHYSIOLOGICAL PSYCHOLOGY</td>
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<tr>
<td>PSY 433</td>
<td>PSYCHOPHARMACOLOGY</td>
<td></td>
</tr>
<tr>
<td>PSY 434</td>
<td>*BRAND AND BEHAVIOR METHODS</td>
<td></td>
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<tr>
<td>PSY 437</td>
<td>MOTIVATION</td>
<td></td>
</tr>
<tr>
<td>PSY 440</td>
<td>*COGNITION RESEARCH</td>
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</tr>
<tr>
<td>PSY 442</td>
<td>PERCEPTION</td>
<td></td>
</tr>
<tr>
<td>PSY 444</td>
<td>LEARNING AND MEMORY</td>
<td></td>
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<tr>
<td>PSY 448</td>
<td>CONSCIOUSNESS</td>
<td></td>
</tr>
<tr>
<td>PSY 454</td>
<td>COGNITIVE DEVELOPMENT</td>
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<tr>
<td>PSY 456</td>
<td>SOCIAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>PSY 458</td>
<td>LANGUAGE ACQUISITION</td>
<td></td>
</tr>
<tr>
<td>PSY 460</td>
<td>*ADVANCED SOCIAL RESEARCH METHODS</td>
<td></td>
</tr>
<tr>
<td>PSY 463</td>
<td>JUDGMENT AND DECISION MAKING</td>
<td></td>
</tr>
<tr>
<td>PSY 464</td>
<td>SOCIAL COGNITION</td>
<td></td>
</tr>
<tr>
<td>PSY 465</td>
<td>WOMEN, WEIGHT, AND BODY IMAGE</td>
<td></td>
</tr>
<tr>
<td>PSY 466</td>
<td>*FAT STUDIES</td>
<td></td>
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<tr>
<td>PSY 468</td>
<td>THE PSYCHOLOGY OF CLOSE RELATIONSHIPS</td>
<td></td>
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<tr>
<td>PSY 470</td>
<td>*PSYCHOMETRICS AND PSYCHOLOGICAL TESTING</td>
<td></td>
</tr>
<tr>
<td>PSY 480</td>
<td>*CLINICAL RESEARCH METHODS</td>
<td></td>
</tr>
<tr>
<td>PSY 482</td>
<td>PSYCHOTHERAPY</td>
<td></td>
</tr>
<tr>
<td>PSY 483</td>
<td>DEVELOPMENTAL PSYCHOPATHOLOGY</td>
<td></td>
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<tr>
<td>PSY 485</td>
<td>BEHAVIOR MODIFICATION</td>
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<td>PSY 492</td>
<td>CONSERVATION PSYCHOLOGY</td>
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<td>PSY 493</td>
<td>POSITIVE PSYCHOLOGY</td>
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<tr>
<td>PSY 494</td>
<td>ENGINEERING PSYCHOLOGY</td>
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<tr>
<td>PSY 495</td>
<td>PSYCHOLOGY OF MEDITATION</td>
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<tr>
<td>PSY 496</td>
<td>INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY</td>
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<tr>
<td>PSY 497</td>
<td>EVOLUTIONARY PSYCHOLOGY</td>
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<tr>
<td>PSY 498</td>
<td>HEALTH PSYCHOLOGY</td>
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</tr>
<tr>
<td>PSY 499</td>
<td>SPECIAL TOPICS (max 4 credits)</td>
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</table>

Variable Credits 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 401</td>
<td>RESEARCH</td>
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<tr>
<td>PSY 402</td>
<td>INDEPENDENT STUDY</td>
<td></td>
</tr>
<tr>
<td>PSY 403</td>
<td>THESIS</td>
<td></td>
</tr>
<tr>
<td>PSY 405</td>
<td>READING AND CONFERENCE</td>
<td></td>
</tr>
<tr>
<td>PSY 406</td>
<td>PROJECTS</td>
<td></td>
</tr>
<tr>
<td>PSY 407</td>
<td>SEMINAR</td>
<td></td>
</tr>
<tr>
<td>PSY 408</td>
<td>WORKSHOP</td>
<td></td>
</tr>
<tr>
<td>PSY 410</td>
<td>PSYCHOLOGY INTERNSHIP</td>
<td></td>
</tr>
</tbody>
</table>

Additional Courses

Select an additional two courses from the Survey or Advanced/Variable Course categories above 8

Total Hours 30

1 No more than 4 credits of individualized coursework (PSY 401–PSY 410) can be applied to the minor

^ Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Minor Code: 965
Psychology Undergraduate Major (BA, BS, HBA, HBS)

Also available at OSU-Cascades, OSU-Portland and via Ecampus.

The School of Psychological Science offers students a variety of educational avenues that provide the necessary tools for competency in, and appreciation for, psychology as a scientific discipline.

Many of our graduates will go straight into the workforce into areas such as human services, human resources, and educational assistants. Many graduates will also continue their education through professional schools such as law, medicine, or optometry. Others will engage in further study in business or in public administration. Some students will continue their study of Psychology at a school with a graduate program in one of the specialty areas of psychology.

In addition to classes whose contents span the many sub disciplines of psychology, the School of Psychological Science at Oregon State values the intellectual contributions of its students and offers a number of opportunities for research experience.

Major Code: 965

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>BI 102 &amp; BI 103</td>
<td>*ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE and *HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE</td>
<td>8</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>PSY 201 &amp; PSY 202</td>
<td>*GENERAL PSYCHOLOGY and *GENERAL PSYCHOLOGY</td>
<td>6</td>
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<tr>
<td>PSY 301</td>
<td>RESEARCH METHODS IN PSYCHOLOGY</td>
<td>4</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
</tbody>
</table>

Survey
Select four courses from the following:

| PSY 330 | BRAIN AND BEHAVIOR                              | 4     |
| or PSY 340 | COGNITION                                       |       |
| PSY 350 | HUMAN LIFESPAN DEVELOPMENT                      |       |
| or PSY 360 | SOCIAL PSYCHOLOGY                               |       |
| PSY 370 | PERSONALITY                                     |       |
| or PSY 381 | ABNORMAL PSYCHOLOGY                             |       |

Plus any one additional course from above

Advanced and Variable Courses
Select four courses from the following (including variable credit courses):

| PSY 425 | *PSYCHOLOGY OF GENDER                           |       |
| PSY 432 | PHYSIOLOGICAL PSYCHOLOGY                        |       |
| PSY 433 | PSYCHOPHARMACOLOGY                              |       |
| PSY 437 | MOTIVATION                                      |       |
| PSY 442 | PERCEPTION                                      |       |
| PSY 444 | LEARNING AND MEMORY                             |       |
| PSY 448 | CONSCIOUSNESS                                   |       |
| PSY 454 | COGNITIVE DEVELOPMENT                           |       |
| PSY 456 | SOCIAL DEVELOPMENT                              |       |
| PSY 458 | LANGUAGE ACQUISITION                            |       |
| PSY 463 | JUDGMENT AND DECISION MAKING                    |       |
| PSY 464 | SOCIAL COGNITION                                |       |
| PSY 465 | WOMEN, WEIGHT, AND BODY IMAGE                   |       |


Variable Credit Courses

| PSY 401 | RESEARCH                                         |       |
| PSY 402 | INDEPENDENT STUDY                                |       |
| PSY 403 | THESIS                                           |       |
| PSY 405 | READING AND CONFERENCE                           |       |
| PSY 406 | PROJECTS                                         |       |
| PSY 407 | SEMINAR                                          |       |
| PSY 408 | WORKSHOP                                         |       |
| PSY 410 | PSYCHOLOGY INTERNSHIP                            |       |

Writing Intensive Course (WIC)
Select one course from the following:

| PSY 434 | *BRAIN AND BEHAVIOR METHODS                     |       |
| PSY 440 | *COGNITION RESEARCH                             |       |
| PSY 460 | *ADVANCED SOCIAL RESEARCH METHODS               |       |
| PSY 470 | *PSYCHOMETRICS AND PSYCHOLOGICAL TESTING        |       |
| PSY 480 | *CLINICAL RESEARCH METHODS                      |       |
| PSY 484 | *PSYCHOLOGY OF ADDICTION                        |       |

Total credits required for graduation is 180

Total Hours 65

* Baccalaureate Core Course (BCC)

^ Writing Intensive Courses (WIC)

1 Students must receive a grade of C− or better in any course applied toward the major. Such courses cannot be taken with S/U grading

2 A maximum of 4 credits of individualized course work (PSY 401–PSY 410) can be applied to the major

Sample Four-Year Plan: Psychology BA

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PSY 201</td>
<td>*GENERAL PSYCHOLOGY</td>
<td>3</td>
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<tr>
<td>BC. Social Processes and Institutions</td>
<td>3</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
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<tr>
<td>PAC</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
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<tr>
<td>Language 111</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>16</td>
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</tbody>
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Winter

| PSY 202 | *GENERAL PSYCHOLOGY                             | 3     |
| BI 102 | *ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE | 4     |
| COMM 111/COMM 114/COMM 218 | *PUBLIC SPEAKING | 3     |
| Language 112 |                                                 | 4     |
|         | Hours                                           | 14    |
### Sample Four-Year Plan: Psychology BS

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Fall</td>
<td>PSY 201 *GENERAL PSYCHOLOGY</td>
<td>3-4</td>
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<tr>
<td></td>
<td></td>
<td>BI 102 *ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE</td>
<td>4</td>
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<tr>
<td></td>
<td>Winter</td>
<td>COMM 111 COMM 114 COMM 218 *PUBLIC SPEAKING</td>
<td>4</td>
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<td>BC. Social Processes and Institutions</td>
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<tr>
<td></td>
<td></td>
<td>HHS 231 *LIFETIME FITNESS FOR HEALTH</td>
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* Baccalaureate Core Course (BCC)

^ Writing Intensive Courses (WIC)
### Elective Credits

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**Total Hours** 177-187

* Baccalaureate Core Course (BCC)

^ Writing Intensive Courses (WIC)

## School of Public Policy

Policy is about the way we make decisions in both private and public contexts. Faculty and students in the School of Public Policy are interested in a wide variety of decision contexts and are particularly interested in advancing the social and policy-related dimensions of OSU’s three areas of distinction: sustainable ecosystems, health and wellness, and economic growth and progress. The School of Public Policy offers undergraduate majors and minors in economics, political science, and sociology, as well as the Master of Public Policy (MPP) degree, PhD in Public Policy, and graduate minors in political science and sociology. School faculty members also participate in the Master of Arts in Interdisciplinary Studies (MAIS) program.

### Undergraduate Programs

The School of Public Policy offers undergraduate major and minor programs in economics, political science, and sociology.

#### Economics Program

The economics program is an excellent choice for students interested in:

- Law school or graduate programs in business, economics, public administration or other social sciences.
- Careers in business or public management.
- Becoming wiser consumers and better-informed citizens.

The study of economics provides a framework for logical thought that can be used to address a wide variety of practical problems and situations. It can provide uncommon insights into society itself. Indeed, people holding degrees in economics are increasingly sought for positions of responsibility and authority in government, business, and industry. The economics major is useful preparation for various careers and for graduate study in many fields, primarily because it does not lead simply to the accumulation of facts but rather develops analytical skills that can be used in many ways.

#### Political Science Program

Graduates of the political science program pursue:

- Careers in all levels of government, foreign service, national and international nongovernmental organizations, journalism, business or public management.
- Law school or graduate programs in political science, public administration, public policy, business, or other social sciences.
- Elected office.

Students can focus their interests in different subfields, including American politics, public law, political theory, international relations, and comparative politics (for example, Asia, Latin America, Western Europe, Russia). Political science majors are encouraged to incorporate a minor in other social science fields such as economics, psychology, or sociology, or in a field of interest related to their specialization in political science. For example, students with an interest in international relations or comparative politics may choose to minor in a language or in history, emphasizing a specific part of the world. Political science majors also are encouraged to consider the International Degree and IE3 Global Internships.

#### Sociology Program

Graduates of the sociology program pursue:

- Careers in community development, criminal justice, business, public policy and administration, social services, non-profit organizations, and research and teaching.
- Graduate programs in sociology, criminology, public policy, social services, human resources, law, social work and other social sciences.

Sociology is the study of human social behavior and sociologists examine interactions within and between groups and resulting social institutions. The undergraduate program in sociology provides a general analysis and broad understanding of human societies and culture for persons in all fields. Selecting courses around a topic or theme of
interest adds meaning to one’s education and strengthens the base of understanding from which one can pursue a career or further education. Two options are currently available for Corvallis campus students — Crime and Justice, and Environmental and Natural Resource Sociology — with the Environmental and Natural Resource option also available for Ecampus students.

**Graduate Programs**

The School of Public Policy offers a Master of Public Policy (MPP) degree, PhD in Public Policy, and graduate minors in Political Science and Sociology, and courses applicable toward the graduate degree in Applied Economics. Faculty members also participate in the Master of Arts in Interdisciplinary Studies (MAIS) program.

**Master of Public Policy (MPP)**

Graduates of the MPP program:

- Are employed at all levels of government as policy analysts, project managers, and managers.
- Work in national and international nongovernmental organizations like the United Nations.
- Pursue further graduate training in law, public administration, public affairs, public policy, and other social science disciplines.

Policy students at OSU focus their studies around environmental and natural resource policy, international policy, social policy, and rural policy, working with strong researchers around campus. Internships with agencies and organizations give policy students real world experience and networks to enhance their classroom education.

**PhD in Public Policy**

The PhD in Public Policy prepares students for academic or nonacademic research careers in the public, private, and nongovernmental sectors. The Public Policy Graduate Program accepts students with backgrounds in related academic disciplines. Like the MPP the PhD program offers concentrations in energy policy; international policy; law, crime, and policy; rural policy; science and technology policy; and/or social policy.

**Master of Arts in Interdisciplinary Studies (MAIS)**

The MAIS program is designed to meet the particular needs and interests of individual students and features collaborative work in any two or three pertinent departments or schools. Sociology faculty members may serve as advisors to students selecting sociology as either a major field or minor field of concentration.

**Graduate Minors**

**Political Science**

Master’s or PhD students interested in adding a Political Science minor should follow the guidelines within their major program in declaring a minor. All students declaring political science as a graduate minor must contact the program coordinator prior to doing so. See the Political Science website (http://gradschool.oregonstate.edu/programs/9600/) for a listing of requirements for the minor concentration.

**Sociology**

Master’s or PhD students interested in adding a Sociology minor should follow the guidelines within their major program in declaring a minor. The minimum number of credits for sociology is 15 or higher if required by the major. All students declaring sociology as a graduate minor must contact the program coordinator prior to doing so. See the Sociology website (http://liberalarts.oregonstate.edu/spp/sociology/programs/graduate-programs/graduate-minor/) for a listing of requirements for the minor concentration.

**Undergraduate Programs**

**Majors**

- Economics (p. 784)
  - Options:
    - General Economics (p. 785)
    - Law, Economics and Policy
    - Managerial Economics
    - Mathematical Economics
  - Political Science (p. 789)
  - Options:
    - Environmental and Energy Politics
    - International Affairs
    - Law and Politics
    - Public Policy (p. 793)
    - Sociology (p. 796)
  - Options:
    - Crime and Justice
    - Environmental and Natural Resource Sociology

**Minors**

- Asian Studies (p. 783)
- Economics (p. 784)
- Political Science (p. 787)
- Sociology (p. 795)

**Graduate Programs**

**Majors**

- Public Policy (p. 792)

**Minors**

- Political Science (p. 787)
- Sociology (p. 795)

**Certificate**

- Rural Policy (p. 795)

**Main Office**

Bexell Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-2811
Fax: 541-737-2289
Email: schoolofpublicpolicy@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/spp/

**Andrew Valls, Interim Director**
Phone: 541-737-9577
Email: andrew.valls@oregonstate.edu

**Laura Relyea, Economics Advisor**
Phone: 541-737-2369
Email: laura.relyea@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/spp/econ/students/
economics-advising (http://liberalarts.oregonstate.edu/spp/econ/
students/economics-advising/)

**Andrew Edwards, Political Science Advisor**
Phone: 541-737-1879
Email: andrew.edwards@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/spp/polisci/students/
political-science-advising (http://liberalarts.oregonstate.edu/spp/polisci/
students/political-science-advising/)

**Robin Fifita, Sociology Advisor**
Phone: 541-737-5733
Email: robin.fifita@oregonstate.edu
Website: http://liberalarts.oregonstate.edu/spp/sociology/students/
sociology-advising (http://liberalarts.oregonstate.edu/spp/sociology/
students/sociology-advising/)

**Helen Fleming, Ecampus Economics/Sociology Advisor**
Phone: 541-737-2352
Email: helen.fleming@oregonstate.edu
Website (Economics): http://liberalarts.oregonstate.edu/spp/econ/
students/economics-advising (http://liberalarts.oregonstate.edu/spp/econ/
students/economics-advising/)
Website (Sociology): http://liberalarts.oregonstate.edu/spp/sociology/
students/sociology-advising (http://liberalarts.oregonstate.edu/spp/sociology/
students/sociology-advising/)

**Kali Odell, BSPP Advisor**
Phone: 541-737-2797
Email: kali.odell@oregonstate.edu
Website: https://liberalarts.oregonstate.edu/spp/ppol/students-advising/
bspp-advising (https://liberalarts.oregonstate.edu/spp/ppol/students-
advising/bspp-advising/)

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**Faculty**

**Professors** M. Edwards, Emerson, Gallagher, Lach, Meng, Plaza, Steel, C. Tremblay, V. Tremblay, Warner, Weber

**Associate Professors** Akins, Bernell, Boudet, Burkhardt, Cramer, Hammer, Henderson, Hurst, Inderbitzin, M. Jones, Johnston, Li, Ortiz, Pughatch, Schroeder, Solberg, Valls

**Assistant Professors** Kretschmer, Spalding, Stout, Thompson, Vue, Wolters

**Instructors** Andersen, Chesbro, Jerman, Kneis, M. Nelson, C. Softau, Nelson, Stanley, Trevathan

**Professor Emeritis** Clinton, Cordray, Färe, Foster, Grosskopf, Lunch, Sahr

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**Economics**

**ECON 199. SPECIAL TOPICS. (1-16 Credits)**
This course is repeatable for 16 credits.

**ECON 201. *INTRODUCTION TO MICROECONOMICS. (4 Credits)**
An introduction to microeconomic principles including the study of price theory, economic scarcity, consumer behavior, production costs, the theory of the firm, market structure, and income distribution. Other selected topics may include market failure, international economics, and public finance. (SS) (Bacc Core Course)

Attributes: CPSi – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

Equivalent to: ECON 201H

Recommended: MTH 111

**ECON 202. *INTRODUCTION TO MACROECONOMICS. (4 Credits)**
An introduction to macroeconomic principles including study of the theories of output determination, consumption, investment, inflation, unemployment, and fiscal and monetary policy. Other selected topics may include the study of the international balance of payments, growth and development, and urban and regional problems. (SS) (Bacc Core Course)

Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

Equivalent to: ECON 202H

Recommended: MTH 111

**ECON 311. INTERMEDIATE MICROECONOMIC THEORY. (4 Credits)**
An examination of demand theory, production and cost theory, game theory, behavioral economics, competitive and imperfectly competitive markets, and general equilibrium and welfare economics. ECON 311 and ECON 411 cannot both be taken for credit toward the economics major.

Prerequisites: ECON 201 with D- or better or ECON 201H with D- or better

Equivalent to: AREC 311, EC 311

**ECON 315. INTERMEDIATE MACROECONOMIC THEORY. (4 Credits)**
An examination of macroeconomic aggregates, income determination, aggregate demand and supply. The basic macroeconomic models will be discussed such as Keynesian, Classical, Monetarist, and Neo-Classical. ECON 315 and ECON 415 cannot both be taken for credit toward the Economics major.

Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-])

Equivalent to: EC 315

**ECON 329. INTRODUCTION TO MATHEMATICAL ECONOMICS. (4 Credits)**
Mathematical methods of economic analysis. Theory of economic structure and optimization developed through calculus and linear algebra, dynamic systems analyzed through integral calculus and difference and differential equations. The mathematical tools are developed in conjunction with their application to economic problems. Some acquaintance with calculus recommended.

Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-]) and (MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-])

Equivalent to: EC 329

**ECON 330. MONEY AND BANKING. (4 Credits)**
Nature and functions of money; functions and operations of depository institutions; the money market; central banking and monetary policy. (SS)

Attributes: LACS – Liberal Arts Social Core

Equivalent to: EC 330

**ECON 340. INTERNATIONAL ECONOMICS. (4 Credits)**
An overview of international economics with an emphasis on current events and applications, including classical and modern trade theory and the study of trade and exchange-rate policies. (SS) (See Schedule Comment regarding Bacc Core status.)

Attributes: LACS – Liberal Arts Social Core

Equivalent to: EC 340
ECON 350. FINANCIAL ECONOMICS. (4 Credits)
Discusses how various securities meet the needs of different economic agents and the efficiency of financial markets in meeting those needs. Topics include interest rates, valuation, investment risk, trading and market structure, arbitrage, market efficiency, debt markets, equity markets, and financial derivatives.
Prerequisites: ECON 201 with D- or better and ECON 202 [D-]
ECON 352. *ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Provides an overview of the interrelationships between economic activity, the environment, and public policy. Through case studies, discussion groups, readings, and group activities, students learn how economists define and analyze environmental problems and the types of policies they advocate for managing environmental quality. CROSSLISTED as AEC 352/ ECON 352. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AEC 352, AREC 352, AREC 352H, EC 352, ECON 352H
ECON 383. *THE ECONOMICS OF DISCRIMINATION. (4 Credits)
An economic analysis of discrimination, focusing on labor market inequities for women and minorities. Historical and current trends in pay, education, and employment disparities, economic explanations for such disparities, and econometric evidence for wage and employment discrimination. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: EC 383
ECON 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
ECON 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
ECON 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EC 401
This course is repeatable for 16 credits.
ECON 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: EC 402
This course is repeatable for 16 credits.
ECON 403. THESIS. (1-16 Credits)
Equivalent to: EC 403
This course is repeatable for 16 credits.
ECON 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EC 405
This course is repeatable for 16 credits.
ECON 406. PROJECTS. (1-16 Credits)
Equivalent to: EC 406
This course is repeatable for 16 credits.
ECON 407. SEMINAR. (1-16 Credits)
Equivalent to: EC 407
This course is repeatable for 16 credits.
ECON 408. WORKSHOP. (1-16 Credits)
Equivalent to: EC 408
This course is repeatable for 16 credits.
ECON 410. INTERNSHIP. (1-16 Credits)
Equivalent to: EC 410
This course is repeatable for 16 credits.
ECON 411. ADVANCED MICROECONOMIC THEORY. (4 Credits)
Rigorous treatment of optimizing behavior of economic agents and markets. Examines utility maximization and demand; cost minimization, profit maximization and supply; perfect competition and monopoly; imperfect competition and game theory; and general equilibrium, social welfare and market failure using sophisticated mathematical tools. Students cannot receive credit toward the major for both ECON 311 and ECON 411.
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-])
ECON 414. BEHAVIORAL ECONOMICS. (4 Credits)
Economic analysis of the effects of social, cognitive, and emotional factors on individual decision making and their implications for market outcomes and policy making. Topics include time inconsistency, decision making under risk, cognitive dissonance, heuristics, social preferences, and experimental economics.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
ECON 415. ADVANCED MACROECONOMIC THEORY. (4 Credits)
Macroeconomics as an application of general equilibrium theory. Macroeconomic models are developed taking preferences and technology as primitives. The models’ short and long run predictions are analyzed and compared to the data. The welfare implications of fiscal and monetary policy are discussed. ECON 315 and ECON 415 cannot both be taken for credit toward the major.
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-]) and (MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-])
ECON 420. GAME THEORY. (4 Credits)
Systematically studies strategic interactions among multiple decision makers with applications in economics, politics, sociology, law, computer science, sports, and biology. Topics taught include static, sequential, and repeated games of perfect and imperfect information.
Attributes: LACS – Liberal Arts Social Core
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 420
ECON 423. PRE-ECONOMETRICS. (4 Credits)
Introduction to probability and statistics with an emphasis on estimation and hypothesis testing. Applications to economic models.
Prerequisites: MTH 241 with D- or better or MTH 251 with D- or better or MTH 251H with D- or better
ECON 424. INTRODUCTION TO ECONOMETRICS. (4 Credits)
Application of statistical techniques, including sampling theory, hypothesis testing, and multiple regression analysis, to economic models. Economic modeling, analysis of economic data, and policy analysis are emphasized. ECON 424 and ECON 427 cannot both be taken for credit toward the major. Lec/lab.
Prerequisites: (ECON 311 with C or better or ECON 411 with C or better) and (ST 351 [C] or ST 351H [C] or ECON 423 [C])
Equivalent to: ECON 325
ECON 427. INTRODUCTION TO ECONOMETRICS WITH CALCULUS. (4 Credits)
Addresses both the theory and practice of econometrics, including
properties of estimators, modeling economic processes, estimation,
hypothesis testing, prediction and interpretation of results. Students
cannot receive credit toward the major for both ECON 424 and ECON 427.
Lec/lab.
Prerequisites: (ECON 311 with C or better or ECON 411 with C or better)
and ECON 423 [C]

ECON 428. INTRODUCTION TO ECONOMIC RESEARCH. (4 Credits)
Basic methods of economic research: concepts and models; data
sources, collection, and presentation; hypothesis formulation and testing;
policy analysis. Written assignments apply methods. (Writing Intensive
Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECON 311 with C- or better or ECON 411 with C- or better
Equivalent to: ECON 328
Recommended: Prior completion of WR II

ECON 435. PUBLIC ECONOMICS. (4 Credits)
Composition and growth of government spending; theory of public
expenditure; analysis of public expenditure programs; benefit-cost
analysis; theory and practice of taxation; analysis of local, state, and
federal taxes; government borrowing and fees; current issues in tax and
expenditure policy.
Prerequisites: ECON 311 with C- or better or ECON 411 with C- or better
Equivalent to: EC 435

ECON 439. PUBLIC POLICY ANALYSIS. (4 Credits)
Theory of public problems and decision making. Evaluation of public
policy strategies, selected public programs and individual public projects
considering the full range of efficiency and equity effects. Direct and
indirect impacts of policy, strength of implicit incentives, administrative
feasibility, and problems of policy implementation. (Writing Intensive
Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 439

ECON 440. ECONOMICS OF GLOBALIZATION. (4 Credits)
Examination of the phenomenon of globalization using economic
analysis to explore controversial themes of the globalization debate—
offshoring, sweatshops, child labor, environmental standards, intellectual
property protection, cultural diversity, economic development,
immigration, and governance.
Prerequisites: ECON 311 with D- or better
Equivalent to: EC 440

ECON 441. INTERNATIONAL FINANCE THEORY AND POLICY. (4 Credits)
Theory and policies of exchange rate regimes; fixed, floating and
managed floats; internal and external trade and capital balances;
international capital flows and institutions.
Prerequisites: ECON 315 with D- or better
Equivalent to: EC 441

ECON 455. ECONOMIC DEVELOPMENT. (4 Credits)
History, theories and policies for economic development in the Third
World of underdeveloped countries. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: ECON 201 with D- or better and ECON 202 [D-]
Equivalent to: EC 449, EC 450, EC 455

ECON 460. INDUSTRIAL ORGANIZATION THEORY AND POLICY. (4 Credits)
The study of the causes of market structure, the behavior of firms in
game theoretic settings, and the welfare implications of competitive and
imperfectly competitive markets; United States antitrust and other laws
regulating business behavior.
Prerequisites: ECON 311 with D- or better and ECON 411 with D- or better
Equivalent to: EC 460

ECON 461. LAW, ECONOMICS, AND REGULATION. (4 Credits)
The analysis of the effectiveness of laws and government regulations
in fostering economic efficiency and fairness. Topics include the design
of laws and policies to promote social welfare and the study of the
effectiveness of criminal law, antitrust law, and the government regulation
of business in promoting social goals.
Prerequisites: ECON 201 with D- or better or ECON 201H with D- or better

ECON 462. MANAGERIAL ECONOMICS. (4 Credits)
The application of microeconomic theory and quantitative methods
to management decisions. Case-oriented course emphasizing actual
business decisions.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better

ECON 463. EFFICIENCY AND PRODUCTIVITY ANALYSIS. (4 Credits)
Workshop on the theory and measurement of performance, especially
efficiency and productivity. Emphasis on application including
introduction to user-friendly software.
Prerequisites: ECON 311 with C or better or ECON 411 with C or better

ECON 466. ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY. (4 Credits)
Reviews and analyzes the economics and structure of world markets for
various traditional energy (e.g., oil, coal, natural gas), as well as renewable
energy (wind, geothermal and solar) with the latter focusing on the
Pacific Northwest electrical industry structure and regulatory framework.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECON 201 with D- or better or ECON 201H with D- or better

ECON 480. LABOR ECONOMICS AND SOCIAL POLICY. (4 Credits)
Interaction of workers and firms in labor markets, social policy and its
effects on labor markets, human capital theory and education policy,
discrimination and other sources of wage differentials, immigration,
unemployment, inequality.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 480
Recommended: Microeconomics such as ECON 517

ECON 491. ECONOMICS OF INEQUALITY. (4 Credits)
An analysis of economic inequality. Describing and measuring inequality,
historical and current trends in inequality, causes and consequences of
inequality, and policy implications.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 491

ECON 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: ECON 311 or ECON 411

ECON 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EC 501
This course is repeatable for 16 credits.

ECON 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: EC 502
This course is repeatable for 16 credits.
ECON 503. THESIS. (1-16 Credits)
Equivalent to: EC 503
This course is repeatable for 999 credits.

ECON 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EC 505
This course is repeatable for 16 credits.

ECON 506. PROJECTS. (1-16 Credits)
Equivalent to: EC 506
This course is repeatable for 16 credits.

ECON 507. SEMINAR. (1-16 Credits)
Equivalent to: EC 507
This course is repeatable for 16 credits.

ECON 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 512. MICROECONOMIC THEORY I. (4 Credits)
Economic theories of consumer behavior and demand, production, cost, the firm, supply, and competitive and monopoly market structures.
Equivalent to: AREC 512
Recommended: ECON 512

ECON 513. MICROECONOMIC THEORY II. (4 Credits)
Economic theories of imperfect competition, input markets, general equilibrium and welfare economics.
Equivalent to: AREC 513
Recommended: ECON 512

ECON 514. BEHAVIORAL ECONOMICS. (4 Credits)
Economic analysis of the effects of social, cognitive, and emotional factors on individual decision making and their implications for market outcomes and policy making. Topics include time inconsistency, decision making under risk, cognitive dissonance, heuristics, social preferences, and experimental economics.
Recommended: ECON 311 or ECON 411

ECON 515. MACROECONOMIC THEORY I. (4 Credits)
Determination of income, employment, and prices in classical, Keynesian, monetarist, and new classical macroeconomic models. Theories of consumption, investment, money demand, and money supply. Monetary and fiscal policies, the role of expectations.
Equivalent to: EC 515
Recommended: ECON 515

ECON 517. MICROECONOMIC THEORY FOR MPP. (4 Credits)
Familiarizes MPP students who do not have a strong background in microeconomics with the material they will need for their future economics course work.
Recommended: Working knowledge of algebra and geometry.

ECON 520. GAME THEORY. (4 Credits)
Systematically studies strategic interactions among multiple decision makers with applications in economics, politics, sociology, law, computer science, sports, and biology. Topics taught include static, sequential, and repeated games of perfect and imperfect information.
Equivalent to: EC 520
Recommended: ECON 311 or ECON 411

ECON 523. STATISTICS FOR ECONOMETRICS. (4 Credits)
Examines mathematical and statistical topics essential for graduate-level econometric analysis, including matrix algebra, probability and distribution theory (emphasizing joint and conditional distributions), statistical inference, and econometric optimization algorithms.
Equivalent to: AREC 523
Recommended: MTH 253 and (ST 351 or ST 351H) and (ST 352 or ECON 424 or ECON 524)

ECON 524. INTRODUCTION TO ECONOMETRICS. (4 Credits)
Application of statistical techniques, including sampling theory, hypothesis testing, and multiple regression analysis, to economic models. Economic modeling, analysis of economic data, and policy analysis are emphasized.
Recommended: (ECON 311 or ECON 411 or ECON 517) and (ST 351 or ST 351H or ECON 423)

ECON 525. ECONOMETRIC METHODS. (4 Credits)
The use of multiple regression under generalized assumptions, specification problems, an introduction to simultaneous equation estimation, the classical linear model using matrices. Emphasis on the analysis of data and communication of findings.
Prerequisites: ECON 523 with C or better
Equivalent to: AREC 525, EC 525
Recommended: (ECON 424 or ECON 524) and ECON 512

ECON 526. APPLIED ECONOMETRICS. (4 Credits)
Model building, hypothesis testing, and appropriate estimation procedures including generalized least squares, seemingly unrelated regressions, simultaneous equations, maximum likelihood, and limited dependent variables. Emphasis on applications and interpretation of results.
Equivalent to: AREC 526, EC 526
Recommended: ECON 525

ECON 535. PUBLIC ECONOMICS. (4 Credits)
Composition and growth of government spending; theory of public expenditure; analysis of public expenditure programs; benefit-cost analysis; theory and practice of taxation; analysis of local, state, and federal taxes; government borrowing and fees; current issues in tax and expenditure policy.
Equivalent to: EC 535
Recommended: ECON 311 or ECON 411

ECON 539. PUBLIC POLICY ANALYSIS. (4 Credits)
Theory of public problems and decision making. Evaluation of public policy strategies, selected public programs and individual public projects considering the full range of efficiency and equity effects. Direct and indirect impacts of policy, strength of implicit incentives, administrative feasibility, and problems of policy implementation.
Equivalent to: EC 539
Recommended: ECON 311 and ECON 435

ECON 540. ECONOMICS OF GLOBALIZATION. (4 Credits)
Examination of the phenomenon of globalization using economic analysis to explore controversial themes of the globalization debate—offshoring, sweatshops, child labor, environmental standards, intellectual property protection, cultural diversity, economic development, immigration, and governance.
Equivalent to: EC 540
Recommended: ECON 311
ECON 541. INTERNATIONAL FINANCE THEORY AND POLICY. (4 Credits)
Theories and policies of exchange rate regimes; fixed, floating and managed floats; internal and external trade and capital balances; international capital flows and institutions.
Equivalent to: EC 541
Recommended: ECON 315

ECON 555. ECONOMIC DEVELOPMENT. (4 Credits)
History, theories and policies for economic development in the Third World of underdeveloped countries.
Equivalent to: EC 555
Recommended: (ECON 201 or ECON 201H) and (ECON 202 or ECON 202H)

ECON 560. INDUSTRIAL ORGANIZATION THEORY AND POLICY. (4 Credits)
The study of the causes of market structure, the behavior of firms in game theoretic settings, and the welfare implications of competitive and imperfectly competitive markets; United States antitrust and other laws regulating business behavior.
Equivalent to: EC 560
Recommended: ECON 311 or ECON 411

ECON 561. LAW, ECONOMICS, AND REGULATION. (4 Credits)
The analysis of the effectiveness of laws and government regulations in fostering economic efficiency and fairness. Topics include the design of laws and policies to promote social welfare and the study of the effectiveness of criminal law, antitrust law, and the government regulation of business in promoting social goals.
Equivalent to: ECON 315 or ECON 411
Recommended: ECON 201 or ECON 201H

ECON 562. MANAGERIAL ECONOMICS. (4 Credits)
The application of microeconomic theory and quantitative methods to management decisions. Case-oriented course emphasizing actual business decisions.
Recommended: ECON 311 or ECON 411

ECON 563. EFFICIENCY AND PRODUCTIVITY ANALYSIS. (4 Credits)
Workshop on the theory and measurement of performance, especially efficiency and productivity. Emphasis on application including introduction to user-friendly software.
Recommended: ECON 311 or ECON 411

ECON 566. ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY. (4 Credits)
Reviews and analyzes the economics and structure of world markets for various traditional energy (e.g., oil, coal, natural gas), as well as renewable energy (wind, geothermal and solar) with the latter focusing on the Pacific Northwest electrical industry structure and regulatory framework.
Recommended: ECON 201 or ECON 201H

ECON 570. MACROECONOMIC THEORY I. (4 Credits)
Introduction to dynamic macroeconomic theory, including a review of Keynesian models, continuous and discrete time programming, Solow, Ramsey, and endogenous growth models, and real business cycle theory.
Recommended: ECON 315 or equivalent.

ECON 580. LABOR ECONOMICS AND SOCIAL POLICY. (4 Credits)
Interaction of workers and firms in labor markets, social policy and its effects on labor markets, human capital theory and education policy, discrimination and other sources of wage differentials; immigration, unemployment, inequality.
Equivalent to: EC 580
Recommended: ECON 311 or ECON 411 or Microeconomics such as ECON 517

ECON 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: ECON 311 or ECON 411 or Microeconomics such as ECON 517

ECON 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 602. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 603. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

Master of Public Policy

MPP 507. SEMINAR. (1-16 Credits)
Selected issues concerning government, public policy, public affairs or non-profit organizations.
This course is repeatable for 16 credits.

MPP 510. INTERNSHIP. (1-16 Credits)
Supervised work experience in government, public policy, public affairs or non-profit organizations. Reports and appraisals required. Graded P/N.
This course is repeatable for 16 credits.

MPP 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 32 credits.

Political Science

PS 110. *GOVERNING AFTER THE ZOMBIE APOCALYPSE. (3 Credits)
Constitution-writing in a post-apocalyptic world. Students write a constitution that addresses issues of difference, power, and discrimination. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PS 110H

PS 110H. *GOVERNING AFTER THE ZOMBIE APOCALYPSE. (3 Credits)
Constitution-writing in a post-apocalyptic world. Students write a constitution that addresses issues of difference, power, and discrimination. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PS 110
PS 201. *INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS. (4 Credits)
Description and analysis of American politics and government, including such topics as interest groups, parties, elections, media, the presidency, Congress, the Constitution, and the courts. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: PS 101, PS 102, PS 102H

PS 204. *INTRODUCTION TO COMPARATIVE POLITICS. (4 Credits)
Major concepts of comparative politics applied to various political settings; the United States, Western Europe, Communist regimes, and developing countries. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

PS 205. *INTRODUCTION TO INTERNATIONAL RELATIONS. (4 Credits)
Analysis of the international system and factors affecting world politics. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: PS 205H

PS 206. *INTRODUCTION TO POLITICAL THOUGHT. (4 Credits)
Introduction to political philosophy. Major ideas and issues of selected political thinkers. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PS 206H

PS 221. INTRODUCTION TO LAW. (4 Credits)
Overview of American law and the U.S. legal system. Topics include legal concepts from selected substantive areas of law, structures and processes of law, and development of basic legal analytical skills.

PS 299. SPECIAL STUDIES. (1-4 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 4 credits.

PS 300. *RESEARCH METHODS. (4 Credits)
Qualitative and quantitative approaches to the study of political phenomena. The role of values, theory, hypothesis, data collection, and analysis in evaluating and conducting political science research. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: PS 400

PS 311. CONGRESSIONAL POLITICS. (4 Credits)
Congressional politics, both on Capitol Hill and in the district, including campaigns, constituent relations, lobbying, legislating, and the legislature in democratic theory.
Equivalent to: PS 411

PS 312. PRESIDENTIAL POLITICS. (4 Credits)
Office, powers, and politics of the American presidency, with reference to other executive offices in American government; emphasis on the importance and effect of the presidency in American politics.

PS 313. CAMPAIGNS AND ELECTIONS. (4 Credits)
Political parties and elections, the conduct of electoral campaigns, the electorate and voting behavior, electoral system, exercise of the suffrage, extent and consequences of voter participation.
Equivalent to: PS 413

PS 314. INTEREST GROUP POLITICS. (4 Credits)
Interest group formation, resources, strategies, and internal struggles, as well as group influence on elections and politics, in government and policy making, and in relation to democratic theory.

PS 315. *THE POLITICS OF MEDIA. (4 Credits)
Examination of the methods of operation, content and effects of the media in relation to politics and government. Includes analysis of newspaper, radio and television, political advertising, and other forms of political communication. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

PS 317. GENDER AND POLITICS. (4 Credits)
Analyzes the role that gender plays in shaping politics and other aspects of society. The course will cover theories of gender difference, gender-based movements, gender and political office, and gender and public policy. (SS)
Attributes: LACS – Liberal Arts Social Core

PS 321. CONSTITUTIONAL LAW: GOVERNMENT POWERS AND CONSTRAINTS. (4 Credits)
The role of the U.S. Supreme Court in shaping the powers and limitations of the U.S. government. The powers of the three main branches of our government, and cases where the powers of these branches clash with one another or with the powers of the states or rights of the individual.

PS 322. *CONSTITUTIONAL LAW: CIVIL RIGHTS AND LIBERTIES. (4 Credits)
Doctrines pertaining to the First, Second and Fourteenth Amendments, such as freedom of speech, of expression, of the press and of the exercise, the right to bear arms and the prohibition against governmental establishment of religion. Issues of discrimination and the reach of the 14th amendment’s equal protection clause, and the right to privacy. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

PS 323. CONSTITUTIONAL LAW: RIGHTS OF THE ACCUSED. (4 Credits)
The role of the U.S. Supreme Court in shaping the powers and limitations of the U.S. government. The powers of the three main branches of our government, and cases where the powers of these branches clash with one another or with the powers of states or rights of the individual.

PS 325. *GENDER AND THE LAW. (4 Credits)
Legal status of American women, with emphasis on constitutional law, the 1964 Civil Rights Act and its amendments, and various state laws as they relate to the legal rights of women. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

PS 326. JUDICIAL PROCESS AND POLITICS. (4 Credits)
Study of the operation, processes, behavior and influence of the state and federal judiciaries, as well as current research in the judiciary as it relates to politics.

PS 328. SPORTS AND POLITICS. (4 Credits)
Topics include: Sport’s interactions with formal political institutions, sports law, sports in the international community, sports at the university, sports and gender, sports and labor politics, and sports and race.

PS 331. *STATE AND LOCAL POLITICS. (4 Credits)
Role, organization, and functions of government at the state and local level. Satisfies teaching certification requirement for course work in state and local government. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: PS 203

PS 341. *EUROPEAN AND EU POLITICS. (4 Credits)
Describes and analyzes the political situation in Europe and the European Union. Special focus is given to issues concerning European security and the European Union, its institutions, politics, and the challenges it faces since the opening of Europe to the East. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
PS 342. THE POLITICS OF CORRUPTION. (4 Credits)
Surveys corruption and how it manifests itself in democracies and centralized states. Topics include theoretical accounts for why corruption occurs, what factors are conducive to producing corruption, the consequences of corruption, and anti-corruption efforts that have succeeded and failed to rectify corruption.

PS 343. *RUSSIAN POLITICS. (4 Credits)
Brief survey of Russian politics in Tsarist and Soviet periods followed by extensive analysis of Russian politics in the late Soviet period under Gorbachev (1985-91), the collapse of the USSR in 1991, and post-Soviet Russian politics (1992-present). (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

PS 344. *LATIN AMERICAN POLITICS. (4 Credits)
The key political, social and economic issues in Latin America. Surveys topics of interest in the region such as economic development, democratization, revolution and political leadership from both an historical and contemporary perspective. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

PS 345. *POLITICS OF DEVELOPING NATIONS. (4 Credits)
Analyzes the concepts of development and modernization. Also focuses on the economic, political, and cultural problems faced by developing nations. (NC) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Equivalent to: PS 345H

PS 346. *MIDDLE EAST POLITICS. (4 Credits)
The comparative study of the Middle East and North Africa focusing on the internal political dynamics of countries in the region and the international relations among them. Examines issues of political and economic development in their post-colonial context and analyzes impact of nationalism, political Islam, ethnicity, and globalization. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PS 446

PS 348. *CHINESE POLITICS. (4 Credits)
Examines China's post-1949 political and economic development. Special attention is given to the reform era from the late 1970s to the present. The course also addresses the impact of the reforms on society and on the country's relationship with the world. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core

PS 349. *BRITISH POLITICS. (4 Credits)
The structure and operation of the British political system, the nature of the political parties and how the governing institutions of the British state have changed over time. The course will also consider how British politics impact upon the culture, politics and institutions of the United States. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

PS 350. *JAPANESE POLITICS. (4 Credits)
Examination of the Japanese political system during the postwar period. Topics include prewar historical influences, political parties, bureaucracy, interest groups, policy processes and issues, political economy, foreign policy, and United States-Japan relations. Attention will also be given to recent dramatic changes in Japan's political system. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

PS 351. AMERICAN FOREIGN POLICY. (4 Credits)
Overview of the role of the United States in the world since World War II and of the factors influencing the formation of American foreign policy. Equivalent to: PS 456

PS 354. *INTERNATIONAL ORGANIZATIONS AND GLOBAL POLITICS. (4 Credits)
The role of international law and organizations in global politics. How sovereign states interact, and what motivates them to commit to supranational laws and intergovernmental organizations. How international law has evolved since the early 1900s. Intergovernmental organizations and treaties, with emphasis on the United Nations, the International Monetary Fund and the World Bank, the World Trade Organization, the European Union, and the North Atlantic Treaty Organization. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 356. INTERNATIONAL POLITICS OF ASIA PACIFIC. (4 Credits)
Examines the most pressing issues facing the region: security and regional economic integration. The major players, their interests, and their differing perspectives on regional issues will be analyzed.

PS 361. CLASSICAL POLITICAL THOUGHT. (4 Credits)
Major political theorists from the pre-Socratics through the Scholastics. (H)
Attributes: LACH – Liberal Arts Humanities Core

PS 362. MODERN POLITICAL THOUGHT. (4 Credits)
Major political theorists from the Renaissance to the mid-nineteenth century. (H)
Attributes: LACH – Liberal Arts Humanities Core

PS 363. *GENDER AND RACE IN AMERICAN POLITICAL THOUGHT. (4 Credits)
Traditional canon of American political thought scrutinized from vantage point of feminist and critical race theory scholarship. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PS 363H

PS 364. CONTEMPORARY POLITICAL THEORY. (4 Credits)
Major issues in contemporary political theory. The specific emphasis of the course may vary from term to term, focusing on questions related to theories of justice, theories of democracy, global political theory, or the work of a single important thinker.

PS 365. AMERICAN POLITICAL THOUGHT. (4 Credits)
Political values and theoretical systems in the American tradition, from the Puritans to the present.

PS 366. *FROM ATLANTIS TO UTOPIA: THE POLITICS OF THE IDEAL STATE. (4 Credits)
The search for the ideal state has occupied political philosophy since antiquity. From Plato's Atlantis story through More's utopia and beyond, philosophers, writers and filmmakers have pondered how to create a perfect state with perfect citizens which will stand the test of time. Each week will combine theoretical reflections from antiquity through post-modernity with a selection of examples from more or less contemporary fiction that will ideally already be known to the audience. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: PS 366H
PS 366H. *FROM ATLANTIS TO UTOPIA: THE POLITICS OF THE IDEAL STATE. (4 Credits)
The search for the ideal state has occupied political philosophy since antiquity. From Plato's Atlantis story through More's utopia and beyond, philosophers, writers and filmmakers have pondered how to create a perfect state with perfect citizens which will stand the test of time. Each week will combine theoretical reflections from antiquity through post-modernity with a selection of examples from more or less contemporary fiction that will ideally already be known to the audience. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: PS 366

PS 370. *SCIENCE, RELIGION, AND POLITICS. (4 Credits)
Addresses historical interplay between religion and science in Western culture, then focuses on the perceived conflicts between science and religion within American socio-political context; illustrates role of politics as the 'playing field' on which social differences contend; requires students to grapple with viewpoints that differ from their own. Team taught. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

PS 371. PUBLIC POLICY PROBLEMS. (4 Credits)
The content and the politics of adoption and application of such policy areas as defense, poverty and welfare, macroeconomics, and regulation.

PS 372. PUBLIC ADMINISTRATION. (4 Credits)
The workings of the modern administrative state, processes and procedures through which government acts, and the balance between powerful government, democratic and accountable government, and efficient government.

PS 374. *SUSTAINABLE LIVING: PRACTICES AND POLICIES. (4 Credits)
Exploration of the role individuals in sustainability practices and policies. Special focus is given to an examination of how individuals can make sustainable lifestyle choices in light of policy regulations, technologies, socio-economic conditions, and cultural values. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

PS 375. *THE CIVIL RIGHTS MOVEMENT AND POLICIES. (4 Credits)
Political and social evolution of the civil rights movement, emphasizing events 1954-1965, and major contemporary civil rights politics and policies in the South and the nation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination Equivalent to: PS 375H

PS 375H. *THE CIVIL RIGHTS MOVEMENT AND POLICIES. (4 Credits)
Political and social evolution of the civil rights movement, emphasizing events 1954-1965, and major contemporary civil rights politics and policies in the South and the nation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator Equivalent to: PS 375

PS 399H. CURRENT PROBLEMS IN POLITICS. (1-4 Credits)
Selected issues of recent American and international concern such as Vietnam, Central America, or similar topical issues. May be repeated for credit when topic varies.
Equivalent to: PS 399H
This course is repeatable for 16 credits.

PS 399H. CURRENT PROBLEMS IN POLITICS. (1-4 Credits)
Selected issues of recent American and international concern such as Vietnam, Central America, or similar topical issues. May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: PS 399
This course is repeatable for 16 credits.

PS 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

PS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

PS 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: PS 405H
This course is repeatable for 16 credits.

PS 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator Equivalent to: PS 405
This course is repeatable for 16 credits.

PS 406. PROJECTS. (1-16 Credits)
Section 1-5: Reading. Associated with the internship for which credit is given in PS 410.
This course is repeatable for 16 credits.

PS 407. SEMINAR. (1-16 Credits)
Equivalent to: PS 407H
This course is repeatable for 16 credits.

PS 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator Equivalent to: PS 407
This course is repeatable for 16 credits.

PS 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PS 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

PS 410. POLITICAL SCIENCE INTERNSHIP. (1-12 Credits)
Supervised work experience in government- or law-related programs or other public affairs organizations. Reports and appraisals required. Only 4 credits may be applied to the major.
This course is repeatable for 12 credits.

PS 425. *GENDER AND THE LAW. (4 Credits)
Legal status of American women, with emphasis on constitutional law, the 1964 Civil Rights Act and its amendments, and various state laws as they relate to the legal rights of women. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Recommended: PS 201 or PS 326

PS 427. NUCLEAR NONPROLIFERATION AND ARMS CONTROL. (4 Credits)
Examines the history, politics and current challenges involving nuclear weapons proliferation and arms control.

PS 428. TERRORISM AND GLOBAL SECURITY. (4 Credits)
PS 441. DEMOCRATIZATION. (4 Credits)
Democratization and the factors that encourage and/or erode democratic stability. Political developments in a wide array of countries, with a particular focus on the unfolding events in the Middle East. Theories of what causes authoritarian regimes to collapse and what helps initially fragile democracies endure or collapse.

PS 446. EAST ASIAN POLITICAL ECONOMY. (4 Credits)
Surveys and analyzes the economic and political development of China, Japan, South Korea, Taiwan, Hong Kong, and Singapore. Japan is examined as a developmental model for the East Asian Newly Industrializing Countries (NICs) and as a major player in the regional economy. China is examined as a contrasting model in terms of its changing pattern of economic development and its importance for the region.
Equivalent to: PS 346

PS 449. *TOPICS IN COMPARATIVE POLITICS. (4 Credits)
Topics in comparative politics not covered in other courses. May be repeated for credit when topic varies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

PS 454. INTERNATIONAL LAW AND ORGANIZATIONS. (4 Credits)
Theories and historical development of international law and organizations; the United Nations system.
Recommended: PS 204 or PS 205

PS 455. *THE POLITICS OF CLIMATE CHANGE. (4 Credits)
Covers domestic and international political aspects of global climate change. Topics include local, state, and national activity as well as roles played by presidents, Congress, the Supreme Court, corporations and media. International focus on conventions and treaties, tensions between developed and developing nations and possible national security impacts. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 457. US-CHINA RELATIONS. (4 Credits)
Equivalent to: PS 557

PS 458. *INTERNATIONAL POLITICAL ECONOMY. (4 Credits)
Examines topics in which politics and economics meet in the international arena, such as trade, debt, finance, development, multinational corporations, and globalization. Does not require a background in economics. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 461. ENVIRONMENTAL POLITICAL THEORY. (4 Credits)
Examines the ways in which political theory enhances our understanding of environmental issues. Focuses on the political and philosophical premises of various environmental perspectives, and how different theories of justice and democracy address issues such as environmental racism, ecological justice, and global climate change.

PS 462. THEORIES OF LAW. (4 Credits)
Covers some of the main theories and approaches to the nature of law. What is law? What is its relation, if any, to morality? What is it that judges do? Questions such as these are explored through reading some of the classic works on the topic.

PS 470. GLOBAL FOOD POLITICS AND POLICY. (4 Credits)
Examines the politics and policy of global food systems as they relate to food distribution, production, and consumption. The cultivation and consumption of food is highly political, and at times, contentious. Specific focus is given to issues like social justice, GMOs, human health, environment and agribusiness.

PS 471. NUCLEAR POLITICS AND POLICY. (4 Credits)
Covers the political and policy implications of nuclear technology, including both nuclear weapons and civilian applications such as nuclear energy.

PS 473. US ENERGY POLICY. (4 Credits)
Addresses US energy policy with respect to how the U.S. governs the production and use of different energy sources, along with the management of its energy infrastructure. Examines policies currently in place, as well as proposals for alternatives, while examining the economic, environmental, national security and energy security implications of different policy approaches.

PS 475. ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Environmental and natural resource issues and policies in national and regional context, emphasizing public attitudes, elections, Congress, public policy, and relevant national and state agencies.

PS 476. *SCIENCE AND POLITICS. (4 Credits)
Relationship between science and the political system in political ideas and history, in bureaucratic politics of science policy, and in contemporary scientific disputes. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

PS 477. INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Analysis of international environmental theory and politics, the development of international environmental regimes, agreements and treaties, and the process of globalization and the quality of the environment.

PS 478. RENEWABLE ENERGY POLICY. (4 Credits)
Renewable energy policy with respect to how the U.S. governs the market development, production and use of different renewable energy sources are addressed.

PS 483. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 483, ES 483, WLC 483

PS 499. SPECIAL TOPICS. (1-16 Credits)
Selected topics in political science of special or current interest not covered in other courses. May be repeated for credit when topic varies. This course is repeatable for 99 credits.

PS 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Independent research project under supervision of graduate faculty. This course is repeatable for 16 credits.

PS 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.
PS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PS 506. PROJECTS. (1-16 Credits)
Section 1-5: Reading. Associated with the internship for which credit is given in PS 410. Completion of this course is required to receive credit for PS 410. Section 11: MU Field Training, 3 credits. Section 12: ASOSU Field Training, 3 credits, each graded P/N.
This course is repeatable for 16 credits.

PS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PS 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

PS 510. POLITICAL SCIENCE INTERNSHIP. (1-12 Credits)
Supervised work experience in government- or law-related programs or other public affairs organizations. Reports and appraisals required.
This course is repeatable for 12 credits.

PS 527. NUCLEAR NONPROLIFERATION AND ARMS CONTROL. (4 Credits)
Examines the history, politics and current challenges involving nuclear weapons proliferation and arms control.

PS 528. TERRORISM AND GLOBAL SECURITY. (4 Credits)

PS 541. DEMOCRATIZATION. (4 Credits)
Democratization and the factors that encourage and/or erode democratic stability. Political developments in a wide array of countries, with a particular focus on the unfolding events in the Middle East. Theories of what causes authoritarian regimes to collapse and what helps initially fragile democracies endure or collapse.

PS 554. INTERNATIONAL LAW AND ORGANIZATIONS. (4 Credits)
Theories and historical development of international law and organizations; the United Nations system.
Recommended: PS 204 or PS 205

PS 555. THE POLITICS OF CLIMATE CHANGE. (4 Credits)
Covers domestic and international political aspects of global climate change. Topics include local, state, and national activity as well as roles played by presidents, Congress, the Supreme Court, corporations and media. International focus on conventions and treaties, tensions between developed and developing nations and possible national security impacts.

PS 557. US-CHINA RELATIONS. (4 Credits)

PS 558. INTERNATIONAL POLITICAL ECONOMY. (4 Credits)
Examines topics in which politics and economics meet in the international arena, such as trade, debt, finance, development, multinational corporations, and globalization. Does not require a background in economics.

PS 561. ENVIRONMENTAL POLITICAL THEORY. (4 Credits)
Examines the ways in which political theory enhances our understanding of environmental issues. Focuses on the political and philosophical premises of various environmental perspectives, and how different theories of justice and democracy address issues such as environmental racism, ecological justice, and global climate change.

PS 562. THEORIES OF LAW. (4 Credits)
Covers some of the main theories and approaches to the nature of law. What is law? What is its relation, if any, to morality? What is it that judges do? Questions such as these are explored through reading some of the classic works on the topic.

PS 570. GLOBAL FOOD POLITICS AND POLICY. (4 Credits)
Examines the politics and policy of global food systems as they relate to food distribution, production, and consumption. The cultivation and consumption of food is highly political, and at times, contentious. Specific focus is given to issues like social justice, GMOs, human health, environment and agribusiness.

PS 573. US ENERGY POLICY. (4 Credits)
Addresses US energy policy with respect to how the U.S. governs the production and use of different energy sources, along with the management of its energy infrastructure. Examines policies currently in place, as well as proposals for alternatives, while examining the economic, environmental, national security and energy security implications of different policy approaches.

PS 575. ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Environmental and natural resource issues and policies in national and regional context, emphasizing public attitudes, elections, Congress, public policy, and relevant national and state agencies.

PS 576. SCIENCE AND POLITICS. (4 Credits)
Relationship between science and the political system in political ideas and history, in bureaucratic politics of science policy, and in contemporary scientific disputes.

PS 577. INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Analysis of international environmental theory and politics, the development of international environmental regimes, agreements and treaties, and the process of globalization and the quality of the environment.

PS 578. RENEWABLE ENERGY POLICY. (4 Credits)
Renewable energy policy with respect to how the U.S. governs the market development, production and use of different renewable energy sources are addressed.

PS 583. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/ their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 583, ES 583, WLC 583

PS 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
PS 808. WORKSHOP. (4 Credits)
Principles of public administration, administrative organization and procedures, public relations. It will include collaborative governance, leadership, and other issues.

Public Policy
PPOL 002. LEADERSHIP. (0 Credits)
Provides students with basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience help students explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

PPOL 402. INDEPENDENT STUDY. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 406. SPECIAL PROJECTS. (1-12 Credits)
Associated with the internship for which credit is given in PPOL 410. This course is repeatable for 12 credits.

PPOL 407. SEMINAR. (1-6 Credits)
This course is repeatable for 6 credits.

PPOL 409. PRACTICUM/CLINICAL EXPERIENCE. (2 Credits)
This discussion-based course will cover topics in public policy based on assigned readings.

PPOL 410. INTERNSHIP/WORK EXPERIENCE. (1-12 Credits)
Supervised work experience in public policy-related programs, government, or organizations. Reports and appraisals required. Only 5 credits may be applied to the major. This course is repeatable for 12 credits.

PPOL 413. ETHICS IN PUBLIC POLICY. (4 Credits)
Examines ethical dilemmas in public policy, and provides the opportunity to study the ethical theories of Hobbes, Kant, Mill, and Rawls.

PPOL 421. INTRODUCTION TO POLICY RESEARCH. (4 Credits)
Introduction to research design, research ethics, and quantitative and qualitative data collection and analysis. Activities include reading, review questions and exercises, discussion board participation, and data collection, analysis and reporting.
Prerequisites: ECON 201 with D or better and PS 201 [D] and SOC 204 [D-]

PPOL 422. *POLICY ANALYSIS. (4 Credits)
Overview of common policy analysis approaches, methods and tools used to identify, assess, present and select public policy. Assignments include reading, reflection, exercises and a multi-stage policy analysis memo project using analyses conducted in PPOL 421.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PPOL 421 with C or better

PPOL 441. *ENERGY AND SOCIETY. (4 Credits)
Explores the complex interrelationships between humans and energy, emphasizing the role of energy in critical social issues, including but not limited to: domestic and international conflict, poverty, social change, inter-generational equity, energy transitions and environmental justice. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

PPOL 446. THE POLICY AND LAW OF U.S. COASTAL GOVERNANCE. (4 Credits)
Examines federal and state policy, legislative and judicial protections of public beach access; ownership and use of tide and submerged lands, including the public trust doctrine; wetland conservation; and the Federal Coastal Zone Management Act. This course is intended to equip future environmental and natural resource professionals with a foundation in US coastal management, especially areas where new professionals will be very involved (coastal development, offshore/alternative energy, and sea level rise/storm hazards). The format includes reading, discussion, and student presentations. Readings will be drawn from the textbook; additional readings will be posted on Canvas.

PPOL 447. INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE. (4 Credits)
Environmental decisions include trade-offs. Policy choices for sustainably providing Earth's eight billion people with food, energy, and water are urgently needed. Policy sectors (such as food) risk outcomes that are not beneficial, and impose long-term costs and potential catastrophic climate burdens. This transdisciplinary course examines emerging integrated policies concerning provision of food, energy, and water and their relationship to climate.

PPOL 448. MARINE POLICY IN THE UNITED STATES. (4 Credits)
Introduces students to the history, rationale, achievements, and gaps in American ocean policy. Students will acquire foundational tools of policy analysis and problem solving, and will synthesize and apply their knowledge creatively in order to propose integrated policy solutions to specific contemporary marine issues.

PPOL 452. INTERNATIONAL COMPARATIVE RURAL POLICY. (4 Credits)
Examines and compares the role of rural policy in different cultural, political and administrative contexts at the international, national, state, regional and local levels. The course also provides the opportunity to study the nature and implications of new forms of governance in rural contexts in North America and Europe.

PPOL 501. RESEARCH AND SCHOLARSHIP. (1-12 Credits)
Graded P/N. This course is repeatable for 99 credits.

PPOL 505. READING AND CONFERENCE. (1-10 Credits)
This course is repeatable for 16 credits.

PPOL 507. SEMINAR. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 510. INTERNSHIP. (1-12 Credits)
Supervised work experience in government, public policy, public affairs or non-profit organizations. Reports and appraisals required. Graded P/N. This course is repeatable for 12 credits.

PPOL 511. PUBLIC ORGANIZATIONS AND LEADERSHIP. (4 Credits)
Provides an historical overview of developments in, and theories associated with, the organization and control of public organizations. Students will critically examine various influential models of bureaucracy, while also learning about the strengths and weaknesses of emergent forms of bureaucratic organization, including networks, public-private partnerships, collaboration, and governance. The course also explores different theories of leadership, assisting students in the development of their own authentic leadership style, and thinking through the application of such theories and styles to the real world of public organization leadership, especially in the fragmented, decentralized, complex, and uncertain contemporary environment of networks, partnerships, and governance.
PPOL 512. PUBLIC POLICY THEORY. (4 Credits)
Theoretical approaches to the study of the policy process, policy elements, policy tools, (e.g., regulation), and policy typologies.
Equivalent to: PS 571

PPOL 521. UNDERSTANDING SOCIAL RESEARCH. (4 Credits)
Study of basic concepts and principles of qualitative and quantitative social research, including selection of general strategies and specific designs, conceptual and operational measurement, sample selection, data collection, data processing and analysis techniques, interpretation and reporting. Utilizes reports of social research in scholarly journals, popular media, and agency documents. Emphasis on critical evaluation and interpretation.
Equivalent to: SOC 515

PPOL 522. QUANTITATIVE METHODS FOR PUBLIC POLICY ANALYSIS. (4 Credits)
Covers a variety of techniques for analyzing quantitative data, including linear regression, logistic regression, and other techniques. Emphasis is placed on working with data and software to answer research questions. Prior knowledge of hypothesis testing and descriptive statistics is assumed.
Prerequisites: PPOL 521 with C or better and ECON 524 [C]
Equivalent to: SOC 516

PPOL 523. QUALITATIVE RESEARCH METHODS. (4 Credits)
An introduction to the theory and methods of qualitative research. Students will be exposed to various qualitative research methods through practical field exercises. These include ethnographic field observation, content analysis, interviewing, focus groups and unobtrusive measures. Other commonly used methods of collecting qualitative data are also examined.
Equivalent to: SOC 518
Recommended: SOC 204 or SOC 204H

PPOL 524. APPLIED RESEARCH METHODS. (4 Credits)
Application of sociological theory, concepts, and methods. Topics vary but may include program evaluation, social impact assessment, policy analysis, focus group research, survey research, among others.
Equivalent to: SOC 519
Recommended: SOC 204 or SOC 204H and at least one upper-division course in sociology.

PPOL 525. MANAGING AND GOVERNING PUBLIC AND NON-PROFIT ORGANIZATIONS. (4 Credits)
Provides students with an introduction to management in public and non-profit organizations. Public and non-profit managers face challenges that are not faced by their counterparts in the private sector. These challenges are often associated with a different legal structure, employee protections, and differences in ethos and motivation. Students will build on knowledge of public administration to examine contemporary issues of public management and public governance and the techniques and challenges of management in practice. Successful completion of the course will equip students to be critically reflective practitioners and scholars of the management of public and non-profit organizations.
Recommended: Public Administration or PS 572 or PPOL 532 or experience in working in public or community service

PPOL 531. INFLUENCING PUBLIC POLICY: AN INTRODUCTION TO THE DARK ARTS. (4 Credits)
Explores the various tactical and strategic behaviors that individuals and groups use to influence public policy. Focusing on the ethical and pragmatic dimensions of policy consequential tactics and strategy, topics vary but may include policy communication, the use of science and evidence, human cognition and decision-making processes, lobbying, and vote and agenda manipulation.

PPOL 541. ENERGY AND SOCIETY. (4 Credits)
Explores the complex interrelationships between humans and energy, emphasizing the role of energy in critical social issues, including but not limited to: domestic and international conflict, poverty, social change, inter-generational equity, energy transitions and environmental justice.

PPOL 544. COLLABORATIVE GOVERNANCE. (4 Credits)
Explores and develops the norms, rules, institutional design, decision-making dynamic, and politics of collaborative governance arrangements for complex natural resource problem settings. Designed to bring together traditional adversaries, government agencies, and citizens to resolve and improve management of collective public problems, collaborative governance for natural resources is now an important problem-solving tool that is employed in thousands of communities, watersheds, and landscapes around the world.

PPOL 545. INTERNATIONAL MARINE POLICY. (4 Credits)
Explores the institutional, political and legal factors that impact international marine policy with an emphasis on the United Nations Law of the Sea Convention. Additional topics include marine resource exploitation, climate change, and national security issues as they pertain to the world's oceans, coasts, and national policies. This course is repeatable for 16 credits.

PPOL 546. THE POLICY AND LAW OF UNITED STATES COASTAL GOVERNANCE. (4 Credits)
Examines federal and state policy, legislative and judicial protections of public beach access; ownership and use of tide and submerged lands, including the public trust doctrine; wetland conservation; and the Federal Coastal Zone Management Act. This course is intended to equip future environmental and natural resource professionals with a foundation in US coastal management, especially areas where new professionals will be very involved (coastal development, offshore/alternative energy, and sea level rise/storm hazards). The format includes reading, discussion, and student presentations. Readings will be drawn from the textbook; additional readings will be posted on Canvas.

PPOL 547. INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE. (4 Credits)
Environmental decisions include trade-offs. Policy choices for sustainably providing Earth's eight billion people with food, energy, and water are urgently needed. Policy sectors (such as food) risk outcomes that are not beneficial, and impose long-term costs and potential catastrophic climate burdens. This transdisciplinary course examines emerging integrated policies concerning provision of food, energy, and water and their relationship to climate.

PPOL 548. MARINE POLICY IN THE UNITED STATES. (4 Credits)
Introduces students to the history, rationale, achievements, and gaps in American ocean and coastal policy. Students will acquire foundational tools of policy problem solving, critique, and analysis, and will synthesize and apply their knowledge creatively to propose integrated policy solutions to specific contemporary marine issues.
PPOL 551. HIGHER EDUCATION POLICY. (4 Credits)
An introduction to policy issues in the area of higher education and exploration of possible tensions within the policy goals of quality, equity, access and outcomes. Students will gain knowledge of the key pieces of legislation and constitutional law governing higher education policy at both federal and state levels, as well as an overview of the relevant research in this area. Begins with a short historical introduction to the U.S. higher education system and concludes with a discussion of its competing demands and functions.

PPOL 552. INTERNATIONAL COMPARATIVE RURAL POLICY. (4 Credits)
Examines and compares the role of rural policy in different cultural, political and administrative contexts at the international, national, state, regional and local levels. The course also provides the opportunity to study the nature and implications of new forms of governance in rural contexts in North America and Europe.

PPOL 599. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 602. INDEPENDENT STUDY. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 603. THESIS. (1-12 Credits)
This course is repeatable for 999 credits.

PPOL 607. SEMINAR. (1-4 Credits)
This course is repeatable for 24 credits.

PPOL 613. ADVANCED POLICY THEORY I. (4 Credits)
First of two-class series introducing a comprehensive review of public policy theory focused on examining theoretical approaches to understanding the complex and contentious assumptions and premises that pose challenges to the way we conduct public policy.

PPOL 614. ADVANCED POLICY THEORY II. (4 Credits)
Second course in a two-course series providing a comprehensive review of public policy theory. The course examines theoretical approaches to understanding the complex and contentious assumptions and premises that pose challenges to the way we conduct public policy.

PPOL 621. ADVANCED QUANTITATIVE METHODS. (4 Credits)
Methods used in research in the social sciences, focused on causal inference in public policy contexts. Covers methods used at the frontier of research to estimate the causal effect of policies on outcomes, including instrumental variables, regression discontinuity, and difference-in-differences estimation.

Recommended: ECON 524

PPOL 622. ADVANCED POLICY ANALYSIS. (4 Credits)
Introduction to advanced quantitative modeling used in policy analysis, with an emphasis on the application of modeling techniques to research papers. Focus is predominantly on counts and zero-truncated modeling, time series, and panel regression.

Prerequisites: ECON 524 with B+ or better and PPOL 522 [B+] or PPOL 621 [C+] or (AEC 523 [C+] and AEC 525 [C+])

PPOL 628. ADVANCED QUALITATIVE METHODS. (4 Credits)
Focus on epistemological approaches, research design, data analysis techniques and critiques of qualitative research, with emphasis on participant observation and interviewing. Culminates in the written and oral presentation of a qualitative research proposal, including preliminary results from fieldwork conducted during the course.

Prerequisites: ANTH 591 with C or better or HDFS 538 with C or better or SOC 518 with C or better

PPOL 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Sociology

SOC 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 204. *INTRODUCTION TO SOCIOLOGY. (3 Credits)
Development and application of sociological concepts and perspectives concerning human groups; includes attention to socialization, culture, organization, stratification, and societies. Consideration of fundamental concepts and research methodology. (SS) (Bacc Core Course)

Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

Equivalent to: SOC 204H

SOC 205. *INSTITUTIONS AND SOCIAL CHANGE. (3 Credits)
Sociological study of the dynamic organizational nature of society through analysis of social change and major social institutions such as family, education, religion, the economy, and political systems. (SS) (Bacc Core Course)

Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

SOC 206. *SOCIAL PROBLEMS AND ISSUES. (3 Credits)
Examination of social problems with particular focus upon U.S. society. Sociological perspectives on definition, description, and analysis of contemporary and recurrent problems in industrialized societies. Investigation of causes and consequences of social problems considered in societal context. (SS) (Bacc Core Course)

Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core

SOC 241. INTRODUCTION TO CRIME AND JUSTICE. (3 Credits)
Provides a sociological understanding of criminal justice system institutions and processes. Emphasis is placed on understanding the criminal law; police and policing; courts and the prosecution process; and prisons, jails and corrections.

SOC 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: SOC 299H
This course is repeatable for 16 credits.

SOC 312. *SOCIOLOGY OF THE FAMILY. (4 Credits)
Survey of the family as a social institution. Addresses historical and cultural perspectives with emphasis on family diversity, variations in family form and life style, interdependence between family and other institutions, analysis of major family issues, forces for change in the family. (Bacc Core Course)

Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

Equivalent to: SOC 312H

SOC 312H. *SOCIOLOGY OF THE FAMILY. (4 Credits)
Survey of the family as a social institution. Addresses historical and cultural perspectives with emphasis on family diversity, variations in family form and life style, interdependence between family and other institutions, analysis of major family issues, forces for change in the family. (Bacc Core Course)

Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator

Equivalent to: SOC 312
SOC 313. SOCIOLGY OF INTIMATE RELATIONSHIPS. (4 Credits)
Examines the microsociological dynamics of intimate relationships. Perceptions and expectations of intimate relationships are explored. Specific attention will be given to issues, processes, and factors that are involved in the construction and management of intimate relationships in contemporary society.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 315. *METHODS I: RESEARCH DESIGN. (4 Credits)
First in a two-course sequence required of all sociology majors. Students learn to formulate researchable questions, devise measures, select data collection techniques, and examine ethical and practical dilemmas in constructing sociological research. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 415

SOC 316. METHODS II: QUANTITATIVE ANALYSIS. (4 Credits)
Second in a two-course sequence required of all sociology majors. The primary objective is to provide students with the statistical skills necessary to analyze sociological data. Covers the construction and interpretation of contingency tables, basic ideas of probability and statistical inference, and an introduction to correlation and regression.
Prerequisites: (SOC 204 with D- or better or SOC 204H with D- or better) and SOC 315 [C-]
Equivalent to: SOC 416

SOC 340. DEVIANT BEHAVIOR AND SOCIAL CONTROL. (4 Credits)
Current perspectives, research and theories of deviant behavior. Review and analysis of various approaches and programs designed to prevent and deal with deviant behavior.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 345. *CRIMES AND VIOLENCE IN INTIMATE RELATIONSHIPS. (4 Credits)
Analyzes the historical, social, political, legal, cultural, and psychological aspects of domestic violence, sexual assault, and stalking. Addresses definitions of the problem, demographics, survivors, perpetrators, witnesses, bystanders, strategies and tactics of abusers and survivors, along with strategies for prevention, intervention, treatment, and social change. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 350. HEALTH, ILLNESS AND SOCIETY. (4 Credits)
Social and cultural factors in the identification, course, and treatment of illness; analysis of selected health settings and professions.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 351. *SOCIOLOGY OF MENTAL ILLNESS. (4 Credits)
Focuses on how social and cultural context impact mental health, and how the very concepts of mental illness, abnormal or crazy are constructed in the first place, then applied by both “mental health” professionals and persons in their everyday lives. Examines major social models of “mental illness,” aiming to understand and evaluate their basic concepts and assumptions, as well as the response to “mental illness,” including how family, friends, troubled persons and professionals interpret, define and respond to “mental illness” and the processes shaping the policies and practices of the mental health enterprise.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 355. DEATH AND DYING. (4 Credits)
An overview of cross-cultural and historical attitudes and practices around end of life, death and dying. Assessment of contemporary legal, professional, cultural and technological issues surrounding end of life/ death and dying.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 360. *POPULATION TRENDS AND POLICY. (4 Credits)
Basic socio-demographic factors affecting population size, distribution, composition and change; examination of local, national, and international trends, and demographic policy. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 371. *SOCIAL MEDIA AND EVERYDAY LIFE. (4 Credits)
Examines key concepts, themes, and theories in the study of social media in today's world. Interconnected themes include communication and the public sphere, self representation, power, and new technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

SOC 372. *POPULAR CULTURE. (4 Credits)
Critical examination of contemporary popular culture from a sociological perspective. Debates in the field of cultural sociology, including a critique of the distinction between 'high' and 'low' forms of culture, the social distinction between work and leisure time, the influence of society on individual patterns of consumption and personal taste, and the sociology of everyday life. Specific topics include mass media, sports, leisure activities, fashion, youth culture, science fiction, music, talk shows, soap operas, internet chat rooms, personal ads, home shopping, and folklore.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 381. SOCIAL DIMENSIONS OF SUSTAINABILITY. (4 Credits)
Exploration of the social forces driving current views of sustainability. Specific attention will be given to values and belief systems, as well as social institutions in shaping sustainability issues related to ecologically sound, socially just, and economically viable outcomes.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 399. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 399H
This course is repeatable for 16 credits.

SOC 399H. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses.
Attributes: HNRS – Honors Course Designator
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 399
This course is repeatable for 16 credits.

SOC 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 403. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 407. SEMINAR. (1-16 Credits)
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
This course is repeatable for 16 credits.

SOC 410. INTERNSHIP . (1-16 Credits)
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 407. SEMINAR. (1-16 Credits)
This course is repeatable for 30 credits.
SOC 412. SOCIOLOGY OF WORK AND FAMILY. (4 Credits)
Survey of the intersections between families and work; variations in family structure, policies and paid and unpaid work in the United States; interdependence between paid and unpaid family labor and broader social change.

SOC 413. SOCIOLOGICAL THEORY. (4 Credits)
Historical and philosophical foundations of sociological theory; major schools of thought and their major contributors.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 418. QUALITATIVE RESEARCH METHODS. (4 Credits)
An introduction to the theory and methods of qualitative research. Students will be exposed to various qualitative research methods through practical field exercises. These include ethnographic field observation, content analysis, interviewing, focus groups and unobtrusive measures. Other commonly used methods of collecting qualitative data are also examined.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 422. SOCIOLOGY OF ORGANIZATIONS. (4 Credits)
Introduces sociological thinking about organizations in contemporary society with an emphasis on exploring the range of frameworks used to think about and explain modern organizations; applies knowledge to specific contemporary organizations.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 424. SOCIAL PSYCHOLOGY. (4 Credits)
Examines individuals in social context; explores dynamics of interpersonal relationships; evaluates link between self and society, including concepts of role/status/identity. Contemporary research design, problems, and findings pertinent to social psychology.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 426. SOCIAL INEQUALITY. (4 Credits)
Evolution of social inequality in society. Emphasis upon the causes and consequences of inequality in power, privilege, and prestige in human societies, with special attention to the United States. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 430. GENDER AND SOCIETY. (4 Credits)
Examination of nature and consequences of social differentiation and stratification on the basis of sex and gender. Analysis of social position of women and men in society, focusing on their positions in institutional areas such as the family, politics, work and education. Evaluation of theories of biological, psychological, and sociological bases for the behavior and characteristics of women and men.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better

SOC 432. SOCIOLOGY OF AGING. (4 Credits)
Examination of the social significance of age, position and problems of the elderly in society; discusses the societal and individual consequences of an aging population; explores social theories of aging.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better

SOC 437. RACE AND ETHNIC RELATIONS. (4 Credits)
Comparative/international perspective on the social construction of race and ethnicity. Social, economic and political experiences of selected groups in the U.S. and other countries are examined.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 438. US IMMIGRATION ISSUES IN THE 21ST CENTURY. (4 Credits)
Provides a critical overview of immigration to the United States from a socio-historic perspective. Examines how successive waves of immigrants have influenced American society from the earliest groups of Europeans in the 19th century to the most recently arriving immigrants from Asia, Latin America and the Caribbean.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 439. WELFARE AND SOCIAL SERVICES. (4 Credits)
Analysis of social, political, and economic forces affecting welfare and social service systems, with overview of current programs, policy issues, public opinions, occupational aspects and societal impacts.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better

SOC 440. JUVENILE DELINQUENCY. (4 Credits)
Contemporary research and theories of juvenile delinquency. Review and evaluation of various strategies and programs designed to prevent delinquency or for treatment of delinquents.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 441. CRIMINOLOGY AND PENOLOGY. (4 Credits)
Review of sociological perspectives on crime and criminal justice, with emphasis upon North America. Review of crime statistics, types of crime, theories of criminality, corrections programs and prisons, and programs to reduce crime.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 442. SOCIOLOGY OF DRUG USE AND ABUSE. (4 Credits)
Emphasizes a sociological understanding of drug use, drug problems and drug policy. In order to understand drug use and abuse it is necessary to understand the chemical properties of the substances at issue, the attributes of the people who use and abuse drugs, and the norms and characteristics of the society in which the substance use occurs.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 444. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside 'inside' students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Prerequisites: SOC 204 with C or better
Equivalent to: SOC 444H

SOC 444H. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside 'inside' students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Attributes: HNRS – Honors Course Designator
Prerequisites: SOC 204 with C or better
Equivalent to: SOC 444

SOC 448. LAW AND SOCIETY. (4 Credits)
An introduction to social scientific approaches to law, covering major topics in the area. Topics may include disputing, legal consciousness, social movements and law, punishment, legal actors, and legal institutions.
Recommended: (SOC 204 or SOC 204H) with minimum grade of D-
SOC 449. LAW, CRIME, AND POLICY. (4 Credits)
Surveys criminal justice policies aimed at enforcing laws, reducing crime, punishing violators, and rehabilitating ex-offenders. Interrogates the behavioral assumptions used in creating and evaluating policies. Examines specific crimes and the policies used to address them.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 450. SOCIOLOGY OF EDUCATION. (4 Credits)
Contemporary perspectives and research on schools, students, teachers and social forces affecting the educational system. Review of comparative and evaluation research on alternative educational strategies and programs. Overview of the literature of educational critics.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 452. SOCIOLOGY OF RELIGION. (4 Credits)
Social patterns within U.S. religious groups, relation of religious groups to society, and the methodological problems in studying such groups.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 453. SOCIOLOGY OF SPORT. (4 Credits)
Critical analysis of sport. Examines sport socialization; deviance; violence; gender; race/ethnicity; professional sport careers; intercollegiate athletics; marriage/family; and the media.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 454. *LEISURE AND CULTURE. (4 Credits)
Examination of the social, cultural, and global significance of leisure activity (in particular, tourism and recreation) from a historical perspective relative to attitudes, values, behaviors, and use of natural resources. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 456. *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT. (4 Credits)
Study of social aspects of science and technology (values, practices, organization, impacts) by analysis of issues revealing their relationship to other social and cultural processes. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 460. THE SOCIOLOGY OF GLOBALIZATION. (4 Credits)
Examines the sociological effect of globalization on Western and non-Western societies. The course focuses on changes in the global economy and how this has influenced the social structure, patterns of change, and mutual influences among societies. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 466. INTERNATIONAL DEVELOPMENT: GENDER ISSUES. (4 Credits)
Examines roles and statuses of women and men throughout the world and differential impact of development on men and women. Evaluates traditional development policies and programs and discusses theories of gender stratification and of modernization. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 470. COLLECTIVE BEHAVIOR. (4 Credits)
Examines current theories; focuses on behavior in crowds and diverse social settings including fads/fashions, ecstatic crowds/miracles, natural/technological disasters, urban legends, collective delusions/mass hysteria, protest/demonstrations, riots/mobs.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 471. *SOCIAL MOVEMENTS. (4 Credits)
Introduces core theoretical and methodological issues related to social movements in the US and abroad. Emphasizes social forces giving rise to movements, tactics employed by movements, and impacts of them on society.
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 472. GIVING AND VOLUNTARIISM. (4 Credits)
Examines concepts of donor motivation, giving, charity, voluntarism, philanthropy, and the nonprofit sector through the analysis of gender roles, ethnic/racial power, status, and social institutions.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 475. RURAL SOCIOLOGY. (4 Credits)
Helps students understand the rich diversity in rural society, with an emphasis on the interdependencies between urban and rural contexts. Current issues and social problems experienced by rural populations and how sociology is used to understand and address issues affecting rural communities are explored.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 480. *ENVIRONMENTAL SOCIOLOGY. (4 Credits)
Explores the evolution of environmental thought, paradigm shifts, and institutional structures associated with environmental concerns, social movements, and social impacts. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 481. *SOCIETY AND NATURAL RESOURCES. (4 Credits)
Explores the complex interrelationships between humans and natural resources, emphasizing how management decisions and organizations are enmeshed in social and cultural contexts. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 499. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students.
Equivalent to: SOC 499, SOC 499H
This course is repeatable for 16 credits.

SOC 499H. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students.
Attributes: HNRS – Honors Course Designator
Equivalent to: SOC 499
This course is repeatable for 16 credits.

SOC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

SOC 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
SOC 510. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

SOC 512. SOCIOLOGY OF WORK AND FAMILY. (4 Credits)
Survey of the intersections between families and work; variations in family structure, policies and paid and unpaid work in the United States; interdependence between paid and unpaid family labor and broader social change.
Recommended: SOC 204 or SOC 204H

SOC 513. SOCIOLOGICAL THEORY. (4 Credits)
Historical and philosophical foundations of sociological theory; major school of thought and their major contributors.
Recommended: SOC 204 or SOC 204H

SOC 515. UNDERSTANDING SOCIAL RESEARCH. (4 Credits)
Study of basic concepts and principles of qualitative and quantitative social research, including selection of general strategies and specific designs, conceptual and operational measurement, sample selection, data collection, data processing and analysis techniques, interpretation and reporting. Utilizes reports of social research in scholarly journals, popular media, and agency documents. Emphasis on critical evaluation and interpretation.
Equivalent to: PPOL 521

SOC 518. QUALITATIVE RESEARCH METHODS. (4 Credits)
An introduction to the theory and methods of qualitative research. Students will be exposed to various qualitative research methods through practical field exercises. These include ethnographic field observation, content analysis, interviewing, focus groups and unobtrusive measures. Other commonly used methods of collecting qualitative data are also examined.
Equivalent to: PPOL 523
Recommended: SOC 204 or SOC 204H

SOC 522. SOCIOLOGY OF ORGANIZATIONS. (4 Credits)
Introduces sociological thinking about organizations in contemporary society with an emphasis on exploring the range of frameworks used to think about and explain modern organizations; applies knowledge to specific contemporary organizations.
Recommended: SOC 204 or SOC 204H

SOC 524. SOCIAL PSYCHOLOGY. (4 Credits)
Examines individuals in social context; explores dynamics of interpersonal relationships; evaluates link between self and society, including concepts of role/status/identity. Contemporary research design, problems, and findings pertinent to social psychology.
Recommended: SOC 204 or SOC 204H

SOC 526. SOCIAL INEQUALITY. (4 Credits)
Evolution of social inequality in society. Emphasis upon the causes and consequences of inequality in power, privilege, and prestige in human societies, with special attention to the United States.
Recommended: SOC 204 or SOC 204H

SOC 530. GENDER AND SOCIETY. (4 Credits)
Examination of nature and consequences of social differentiation and stratification on the basis of sex and gender. Analysis of social position of women and men in society, focusing on their positions in institutional areas such as the family, politics, work and education. Evaluation of theories of biological, psychological, and sociological bases for the behavior and characteristics of women and men.
Recommended: SOC 204 or SOC 204H

SOC 532. SOCIOLOGY OF AGING. (4 Credits)
Examination of the social significance of age, position and problems of the elderly in society; discusses the societal and individual consequences of an aging population; explores social theories of aging.
Recommended: SOC 204 or SOC 204H

SOC 537. RACE AND ETHNIC RELATIONS. (4 Credits)
Comparative/international perspective on the social construction of race and ethnicity. Social, economic and political experiences of selected groups in the U.S. and other countries are examined.
Recommended: SOC 204 or SOC 204H

SOC 538. US IMMIGRATION ISSUES IN THE 21ST CENTURY. (4 Credits)
Provides a critical overview of immigration to the United States from a socio-historic perspective. Examines how successive waves of immigrants have influenced American society from the earliest groups of Europeans in the 19th century to the most recently arriving immigrants from Asia, Latin America and the Caribbean.

SOC 539. WELFARE AND SOCIAL SERVICES. (4 Credits)
Analysis of social, political, and economic forces affecting welfare and social service systems, with overview of current programs, policy issues, public opinions, occupational aspects and societal impacts.
Recommended: SOC 204 or SOC 204H or SOC 205 or SOC 206

SOC 540. JUVENILE DELINQUENCY. (4 Credits)
Contemporary research and theories of juvenile delinquency. Review and evaluation of various strategies and programs designed to prevent delinquency or for treatment of delinquents.
Recommended: SOC 204 or SOC 204H

SOC 541. CRIMINOLOGY AND PENOLOGY. (4 Credits)
Review of sociological perspectives on crime and criminal justice, with emphasis upon North America. Review of crime statistics, types of crime, theories of criminality, corrections programs and prisons, and programs to reduce crime.
Recommended: SOC 204 or SOC 204H

SOC 542. SOCIOLOGY OF DRUG USE AND ABUSE. (4 Credits)
Emphasizes a sociological understanding of drug use, drug problems and drug policy. In order to understand drug use and abuse it is necessary to understand the chemical properties of the substances at issue, the attitudes of the people who use and abuse drugs, and the norms and characteristics of the society in which the substance use occurs.

SOC 544. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside ‘inside’ students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Recommended: SOC 204

SOC 548. LAW AND SOCIETY. (4 Credits)
An introduction to social scientific approaches to law, covering major topics in the area. Topics may include disputing, legal consciousness, social movements and law, punishment, legal actors, and legal institutions.
Recommended: (SOC 204 or SOC 204H) with minimum grade of D-
**SOC 550. SOCIOLOGY OF EDUCATION. (4 Credits)**
Contemporary perspectives and research on schools, students, teachers and social forces affecting the educational system. Review of comparative and evaluation research on alternative educational strategies and programs. Overview of the literature of educational critics. **Recommended:** SOC 204 or SOC 204H

**SOC 552. SOCIOLOGY OF RELIGION. (4 Credits)**
Social patterns within U.S. religious groups, relation of religious groups to society, and the methodological problems in studying such groups. **Recommended:** SOC 204 or SOC 204H

**SOC 553. SOCIOLOGY OF SPORT. (4 Credits)**
Critical analysis of sport. Examines sport socialization; deviance; violence; gender; race/ethnicity; professional sport careers; intercollegiate athletics; marriage/family; and the media. **Recommended:** SOC 204 or SOC 204H

**SOC 554. LEISURE AND CULTURE. (4 Credits)**
Examination of the social, cultural, and global significance of leisure activity (in particular, tourism and recreation) from a historical perspective relative to attitudes, values, behaviors, and use of natural resources. **Recommended:** SOC 204 or SOC 204H

**SOC 556. SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT. (4 Credits)**
Study of social aspects of science and technology (values, practices, organization, impacts) by analysis of issues revealing their relationship to other social and cultural processes. **Recommended:** SOC 204 or SOC 204H

**SOC 560. THE SOCIOLOGY OF GLOBALIZATION. (4 Credits)**
Examines the sociological effect of globalization on Western and non-Western societies. The course focuses on changes in the global economy and how this has influenced the social structure, patterns of change, and mutual influences among societies. **Recommended:** SOC 204 or SOC 204H

**SOC 566. INTERNATIONAL DEVELOPMENT: GENDER ISSUES. (4 Credits)**
Examines roles and statuses of women and men throughout the world and differential impact of development on men and women. Evaluates traditional development policies and programs and discusses theories of gender stratification and of modernization. **Recommended:** SOC 204 or SOC 204H

**SOC 570. COLLECTIVE BEHAVIOR. (4 Credits)**
Examines current theories; focuses on behavior in crowds and diverse social settings including fads/fashions, ecstatic crowds/miracles, natural/technological disasters, urban legends, collective delusions/ mass hysteria, protest/demonstrations, riots/mobs. **Recommended:** SOC 204 or SOC 204H

**SOC 571. SOCIAL MOVEMENTS. (4 Credits)**
Introduces core theoretical and methodological issues related to social movements in the US and abroad. Emphasizes social forces giving rise to movements, tactics employed by movements, and impacts of them on society. **Recommended:** SOC 204 or SOC 204H

**SOC 572. GIVING AND VOLUNTARISM. (4 Credits)**
Examines concepts of donor motivation, giving, charity, voluntarism, philanthropy, and the nonprofit sector through the analysis of gender roles, ethnicity, power, status, and social institutions. **Recommended:** SOC 204 or SOC 204H

**SOC 575. RURAL SOCIOLOGY. (4 Credits)**
Helps students understand the rich diversity in rural society, with an emphasis on the interdependencies between urban and rural contexts. Current issues and social problems experienced by rural populations and how sociology is used to understand and address issues affecting rural communities are explored. **Recommended:** SOC 204 or SOC 204H

**SOC 580. ENVIRONMENTAL SOCIOLOGY. (4 Credits)**
Explores the evolution of environmental thought, paradigm shifts, and institutional structures associated with environmental concerns, social movements, and social impacts. **Recommended:** SOC 204 or SOC 204H

**SOC 581. SOCIETY AND NATURAL RESOURCES. (4 Credits)**
Explores the complex interrelationships between humans and natural resources, emphasizing how management decisions and organizations are enmeshed in social and cultural contexts. **Recommended:** SOC 204 or SOC 204H

**SOC 599. SPECIAL TOPICS. (1-16 Credits)**
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students. **Equivalent to:** SOC 590
This course is repeatable for 16 credits. **Recommended:** SOC 204 or SOC 204H

**SOC 808. WORKSHOP. (1-16 Credits)**
This course is repeatable for 16 credits.

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### Asian Studies Minor

The minor program will provide an opportunity for students majoring in fields such as business, engineering, or sciences who will be working in Asia or with Asians. They will gain a significant degree of cultural literacy that will be critical for their professional success. In addition, the program will be an outstanding supplement to a traditional liberal arts major for students with particular interests in Asia, who want to study abroad, or who plan to go on to do graduate work in areas with concentrations in aspects of Asia.

**Minor Code: 938**

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Select 19-20 credits of the following (two disciplines):</td>
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<tr>
<td>ANTH 316</td>
<td>*PEOPLES OF THE WORLD-SOUTH AND SOUTHEAST ASIA</td>
<td>19-20</td>
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<tr>
<td>ANTH 318</td>
<td>*PEOPLES OF THE WORLD-CHINA</td>
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<td>ANTH 319</td>
<td>*PEOPLES OF THE WORLD-JAPAN AND KOREA</td>
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<tr>
<td>ART 208</td>
<td>*INTRODUCTION TO ASIAN ART</td>
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<tr>
<td>ART 310</td>
<td>*EARLY CHINESE ART AND ARCHAEOLOGY</td>
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<td>ART 311</td>
<td>*LATE CHINESE ART AND CULTURE</td>
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<td>ART 313</td>
<td>*ART OF JAPAN</td>
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<td>BA 347</td>
<td>INTERNATIONAL BUSINESS</td>
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<tr>
<td>ES 231</td>
<td>*INTRODUCTION TO ASIAN AMERICAN STUDIES</td>
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<td>ES 233</td>
<td>*ASIAN PACIFIC AMERICAN ACTIVISM AND EMPOWERMENT</td>
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<tr>
<td>ES 332</td>
<td>ASIAN PACIFIC AMERICANS AND THE MEDIA</td>
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</tr>
<tr>
<td>GEG 313</td>
<td>*GEOGRAPHY OF ASIA</td>
<td></td>
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<tr>
<td>GEG 330</td>
<td>**GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION</td>
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<tr>
<td>HST 391</td>
<td>*TRADITIONAL CHINA AND JAPAN</td>
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<td>HST 392</td>
<td>*MODERN CHINA AND JAPAN</td>
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<tr>
<td>HST 396</td>
<td>*GENDER, FAMILY AND POLITICS IN TRADITIONAL CHINA</td>
<td></td>
</tr>
</tbody>
</table>
**Economics Minor**

Also available via Ecampus.

**Minor Code: 885**

Students minoring in economics must complete a minimum of 27 credits with a GPA of at least 2.0 in their program of study. A maximum of two classes (8 credits) may be taken on an S/U basis.

### Code | Title | Hours
---|---|---
ECON 201 | *INTRODUCTION TO MICROECONOMICS | 4
ECON 202 | *INTRODUCTION TO MACROECONOMICS | 4
ECON 311 | INTERMEDIATE MICROECONOMIC THEORY | 4
or ECON 411 | ADVANCED MICROECONOMIC THEORY | 4
ECON 415 | INTERMEDIATE MACROECONOMIC THEORY | 4
or ECON 315 | ADVANCED MACROECONOMIC THEORY | 4
ECON 423 | PRE-ECONOMETRICS | 4
ECON 427 | INTRODUCTION TO ECONOMETRICS WITH CALCULUS | 4
or ECON 424 | INTRODUCTION TO ECONOMETRICS | 4

Select one of the following:

- ECON 428 | *INTRODUCTION TO ECONOMIC RESEARCH | 4
- ECON 439 | *PUBLIC POLICY ANALYSIS | 4
- ECON 466 | *ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY | 4
- MTH 241 | OR MTH 251 | *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE | 4
- or MTH 251 | DIFFERENTIAL CALCULUS | 4

**Total credits required for graduation** 180

---

**A recommended program of study for economics majors:**

### Course | Title | Hours
---|---|---
Second Year
Freshman Year or Sophomore Year
ECON 201 | *INTRODUCTION TO MICROECONOMICS | 4
ECON 202 | *INTRODUCTION TO MACROECONOMICS | 4
MTH 241 | OR MTH 251 | *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE | 4
or MTH 251 | DIFFERENTIAL CALCULUS | 4

**Total** 12

### Third Year
Sophomore or Junior Year
ECON 411 | ADVANCED MICROECONOMIC THEORY | 4
or ECON 311 | INTERMEDIATE MICROECONOMIC THEORY | 4
ECON 415 | ADVANCED MACROECONOMIC THEORY | 4
or ECON 315 | INTERMEDIATE MACROECONOMIC THEORY | 4
ECON 423 | PRE-ECONOMETRICS | 4
ECON 427 | INTRODUCTION TO ECONOMETRICS WITH CALCULUS | 4
or ECON 424 | INTRODUCTION TO ECONOMETRICS | 4

**Total** 16

### Fourth Year
Junior or Senior Year
Select one of the following:

---

**Minor Code: 885**

**Economics Undergraduate Major (BA, BS, HBA, HBS)**

Also available via Ecampus (http://ecampus.oregonstate.edu/).

Businesses want employees who can think, communicate orally, write, and solve problems and who are comfortable with quantitative analysis. The traditional economics major perfectly prepares students to meet these demands.
Law, Economics and Policy Option

This option is offered within the following major(s):
- Economics - College of Liberal Arts (p. 784)

Also available via Ecampus.

The Law, Economics and Policy option is an interdisciplinary program drawing from political science and philosophy courses as well as economics. This option serves students interested in public service or advanced study in law or public policy.

Option Code: 889

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 311</td>
<td>INTERMEDIATE MICROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 411</td>
<td>ADVANCED MICROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>ECON 315</td>
<td>INTERMEDIATE MACROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 415</td>
<td>ADVANCED MACROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>ECON 424</td>
<td>INTRODUCTION TO ECONOMETRICS</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 427</td>
<td>INTRODUCTION TO ECONOMETRICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 428</td>
<td>*INTRODUCTION TO ECONOMIC RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 439</td>
<td>*PUBLIC POLICY ANALYSIS (Cannot count towards the option if used for WIC)</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 466</td>
<td>*ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY</td>
<td>4</td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 423</td>
<td>PRE-ECONOMETRICS</td>
<td>4</td>
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</tbody>
</table>

Option Requirements
Select 4 courses from the following, including at least 2 from economics: 23
- ECON 383 *THE ECONOMICS OF DISCRIMINATION
- ECON 414 BEHAVIORAL ECONOMICS
- ECON 435 PUBLIC ECONOMICS
- ECON 439 *PUBLIC POLICY ANALYSIS (Cannot count towards the option if used for WIC)
- ECON 461 LAW, ECONOMICS, AND REGULATION
- ECON 466 *ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY (Cannot count towards the option if used for WIC)
- ECON 480 LABOR ECONOMICS AND SOCIAL POLICY
- ECON 491 ECONOMICS OF INEQUALITY
- PHL 321 DEDUCTIVE LOGIC
- PS 321 CONSTITUTIONAL LAW: GOVERNMENT POWERS AND CONSTRAINTS
- PS 326 JUDICIAL PROCESS AND POLITICS
- PS 371 PUBLIC POLICY PROBLEMS

Select 2 additional upper-division economics courses

Total Hours 51

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

• All students must receive a grade of "C" (2.00) or better in all upper-division required courses and must maintain an overall grade point average (GPA) of 2.00 in all courses taken toward the Economics major. None of the 51 credits may be taken S/U. Students cannot receive credit toward the major for both ECON 311 and ECON 411, for both ECON 315 and ECON 415, and for both ECON 424 and ECON 427. No more than 4 credits of self-study courses (ECON 401 - 410) may be counted towards the 51 credit requirement.

Option Code: 889

General Economics Option

This option is offered within the following major(s):
- Economics - College of Liberal Arts (p. 784)

Also available via Ecampus.

Organizations want employees who can think, communicate orally, write, and solve problems, and who are comfortable with quantitative analysis. The General Economics Option perfectly prepares students to meet these demands.

Option Code: 898

To receive an option in General Economics you must complete a minimum of 51 credits as listed below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 411</td>
<td>ADVANCED MICROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 311</td>
<td>INTERMEDIATE MICROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>ECON 415</td>
<td>ADVANCED MACROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 315</td>
<td>INTERMEDIATE MACROECONOMIC THEORY</td>
<td>4</td>
</tr>
<tr>
<td>ECON 423</td>
<td>PRE-ECONOMETRICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 424</td>
<td>INTRODUCTION TO ECONOMETRICS</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 427</td>
<td>INTRODUCTION TO ECONOMETRICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 428</td>
<td>*INTRODUCTION TO ECONOMIC RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 439</td>
<td>*PUBLIC POLICY ANALYSIS (Cannot count towards the option if used for WIC)</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 466</td>
<td>*ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY</td>
<td>4</td>
</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
<tr>
<td>or ECON 423</td>
<td>PRE-ECONOMETRICS</td>
<td>4</td>
</tr>
</tbody>
</table>

Additional Requirements 1
19 additional credits of approved economics courses at the 300 level or above, at least 4 credits of which must be in courses numbered 411 or higher.

Total Hours 51

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

1 All students must receive a grade of "C" (2.00) or better in all upper-division required courses and must maintain an overall grade point average (GPA) of 2.00 in all courses taken toward the Economics major. None of the 51 credits may be taken S/U. Students cannot receive credit toward the major for both ECON 311 and ECON 411, for both ECON 315 and ECON 415, and for both ECON 424 and ECON 427. No more than 4 credits of self-study courses (ECON 401 - 410) may be counted towards the 51 credit requirement.

Option Code: 898
Managerial Economics Option

This option is offered within the following major(s):

- Economics - College of Liberal Arts (p. 784)

Also available via Ecampus.

The Managerial Economics option is an interdisciplinary program which allows students to use business classes toward the requirements of the economics degree. The Managerial Economics option is suited for students interested in pursuing jobs or graduate study in business with a strong economics background.

Mathematical Economics Option

This option is offered within the following major(s):

- Economics - College of Liberal Arts (p. 784)

As the economics profession becomes increasingly mathematical, economics majors who plan to go to graduate school need a strong math background. The Mathematical Economics option provides the necessary mathematical preparation for graduate school bound economics majors. It also serves students who desire a more quantitative program or who come into the major with significant math preparation to apply math toward their degrees in economics.
Political Science Graduate Minor

Graduate Areas of Concentration

American politics, judicial politics, public administration, political theory, state and local government, international relations, comparative politics, gender politics, environmental policy

Graduate work in Political Science may serve as a field of study for a Master of Arts in Interdisciplinary Studies (MAIS) degree or as a minor in other advanced degree programs. The political science program aims to provide a systematic understanding of political processes, institutions, theories, and behavior. Students are encouraged to acquire competence in statistics as aids to analyzing political phenomena.

Minor Code: 9600

Students may choose the “generic” graduate minor, which simply requires 16 credits of graduate course work in political science for Master’s students and 20 credits for doctoral students. Or, students may choose one of two tracks within the minor: Environmental and Energy Politics; and International Politics. Students pursuing a track may choose any of the political science courses listed for that track. Students may also count one of the non-political science courses listed under the track toward the political science graduate minor.

For the generic graduate minor in political science, no specific courses are required. Master’s students must take 16 credits of graduate course work in political science, and PhD students must take 20 credits. Any combination of graduate political science courses will satisfy this requirement, but a maximum of 4 credits from PS 501–PS 510 may be counted toward the minor.

For one of the two tracks, Master’s students must choose four (4) courses from the list of courses for the track, at least three (3) being from political science; and PhD students must choose five (5) courses, at least four (4) being from political science. Students may take one non-political science course on the list, and may also count up to 4 credits from PS 501–PS 510 toward the option.

Environmental and Energy Politics Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 555</td>
<td>THE POLITICS OF CLIMATE CHANGE</td>
<td>4</td>
</tr>
<tr>
<td>PS 570</td>
<td>GLOBAL FOOD POLITICS AND POLICY</td>
<td>4</td>
</tr>
<tr>
<td>PS 573</td>
<td>US ENERGY POLICY</td>
<td>4</td>
</tr>
<tr>
<td>PS 575</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
<td>4</td>
</tr>
<tr>
<td>PS 576</td>
<td>SCIENCE AND POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 577</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
<td>4</td>
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<tr>
<td>PS 578</td>
<td>RENEWABLE ENERGY POLICY</td>
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</table>

Non-Political Science Courses

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<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ECON 566</td>
<td>ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY</td>
<td>4</td>
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<tr>
<td>PPOL 545</td>
<td>INTERNATIONAL MARINE POLICY</td>
<td>4</td>
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<tr>
<td>PPOL 546</td>
<td>THE POLICY AND LAW OF UNITED STATES COASTAL GOVERNANCE</td>
<td>4</td>
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<tr>
<td>PPOL 547</td>
<td>INTEGRATED POLICY, FOOD, ENERGY, WATER, CLIMATE</td>
<td>4</td>
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<tr>
<td>PPOL 548</td>
<td>MARINE POLICY IN THE UNITED STATES</td>
<td>4</td>
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<tr>
<td>SOC 580</td>
<td>ENVIRONMENTAL SOCIOLOGY</td>
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<tr>
<td>SOC 581</td>
<td>SOCIETY AND NATURAL RESOURCES</td>
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International Politics Track

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PS 541</td>
<td>DEMOCRATIZATION</td>
<td>4</td>
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<tr>
<td>PS 555</td>
<td>THE POLITICS OF CLIMATE CHANGE</td>
<td>4</td>
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<tr>
<td>PS 557</td>
<td>US-CHINA RELATIONS</td>
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<td>PS 558</td>
<td>INTERNATIONAL POLITICAL ECONOMY</td>
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<tr>
<td>PS 570</td>
<td>GLOBAL FOOD POLITICS AND POLICY</td>
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<tr>
<td>PS 577</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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Non-Political Science Courses

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<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ECON 540</td>
<td>ECONOMICS OF GLOBALIZATION</td>
<td>4</td>
</tr>
<tr>
<td>ECON 541</td>
<td>INTERNATIONAL FINANCE THEORY AND POLICY</td>
<td>4</td>
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<tr>
<td>ECON 555</td>
<td>ECONOMIC DEVELOPMENT</td>
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<tr>
<td>PPOL 545</td>
<td>INTERNATIONAL MARINE POLICY</td>
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<tr>
<td>SOC 560</td>
<td>THE SOCIOLOGY OF GLOBALIZATION</td>
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<tr>
<td>SOC 566</td>
<td>INTERNATIONAL DEVELOPMENT: GENDER ISSUES</td>
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</table>

Minor Code: 9600

Political Science Minor

Also available at OSU-Cascades and via Ecampus.

The Political Science Program offers students the ability to augment their primary major by adding a minor in political science. Because politics and policy are relevant to all disciplines, understanding how your discipline interacts with political systems and policymaking can enhance any program of study and strengthen students’ graduate school applications and resumes for future employment.

Minor Code: 960

The structure of the Political Science minor mirrors that of the major. In both, there is a “general” program of study that provides a wide array of choices among courses, as well as three “tracks” that afford students the opportunity for specialization. All students in the minor must complete at least seven courses (28 credits), of which at least 3 courses (12 credits) must be taken at Oregon State University. Students must maintain a 2.0 GPA in their OSU courses. In addition, no more than four (4) credits from PS 401 – PS 410 may count toward the minor. No more than eight credits may be from courses taken S/U.

General Minor

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PS 201</td>
<td>INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
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<tr>
<td>PS 204</td>
<td>INTRODUCTION TO COMPARATIVE POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 205</td>
<td>INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td>4</td>
</tr>
<tr>
<td>PS 206</td>
<td>INTRODUCTION TO POLITICAL THOUGHT</td>
<td>4</td>
</tr>
</tbody>
</table>

Select five upper-division 300/400 level courses in political science | 20

Total Hours | 28

Minor Tracks

Students can select one of three concentrations in the minor: Law and Politics; International Affairs; or Environmental and Energy Politics. These tracks correspond to the options within the Political Science major.

To complete any of these tracks within the minor, students must take the two introductory courses for the track, and at least four courses from the list of upper-division courses in the track. One of these may be a non-
political science course on the list. The fifth upper-division course may be a political science course on the list, or may be an upper-division PS course not on the list.

**Law and Politics Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 206</td>
<td>*INTRODUCTION TO POLITICAL THOUGHT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Upper-Division Political Science Courses**

Select four courses from the following: 16

- PS 311 | CONGRESSIONAL POLITICS                      |
- PS 312 | PRESIDENTIAL POLITICS                       |
- PS 321 | CONSTITUTIONAL LAW: GOVERNMENT POWERS AND CONSTRAINTS |
- PS 322 | *CONSTITUTIONAL LAW: CIVIL RIGHTS AND LIBERTIES |
- PS 323 | CONSTITUTIONAL LAW: RIGHTS OF THE ACCUSED    |
- PS 325 | *GENDER AND THE LAW                          |
- PS 326 | JUDICIAL PROCESS AND POLITICS                |
- PS 331 | *STATE AND LOCAL POLITICS                   |
- PS 361 | CLASSICAL POLITICAL THOUGHT                  |
- PS 362 | MODERN POLITICAL THOUGHT                     |
- PS 363 | *GENDER AND RACE IN AMERICAN POLITICAL THOUGHT |
- PS 365 | AMERICAN POLITICAL THOUGHT                   |
- PS 370 | *SCIENCE, RELIGION, AND POLITICS             |
- PS 371 | PUBLIC POLICY PROBLEMS                       |
- PS 372 | PUBLIC ADMINISTRATION                        |
- PS 375 | *THE CIVIL RIGHTS MOVEMENT AND POLICIES      |
- PS 454 | INTERNATIONAL LAW AND ORGANIZATIONS          |
- PS 462 | THEORIES OF LAW                              |

**Upper-Division Non-Political Science Courses**

- ECON 461 | LAW, ECONOMICS, AND REGULATION |
- SOC 340 | DEViant BEHAVIOR AND SOCIAL CONTROL |
- SOC 438 | US IMMIGRATION ISSUES IN THE 21ST CENTURY |
- SOC 440 | JUVENILE DELinquENCY |
- SOC 441 | CRIMINOLOGY AND PENOLOGY |
- SOC 442 | SOCIOLOGY OF DRUG USE AND ABUSE |
- SOC 448 | LAW AND SOCIETY |

Select one of the following: 4

- Upper-division course from the list above
- Upper-division PS course not on the list

**Total Hours: 28**

**Environmental and Energy Politics Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td>4</td>
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</tbody>
</table>

**Upper-Division Political Science Courses**

Select four courses from the following: 16

- PS 314 | INTEREST GROUP POLITICS                      |
- PS 331 | *STATE AND LOCAL POLITICS                   |
- PS 371 | PUBLIC POLICY PROBLEMS                       |
- PS 372 | PUBLIC ADMINISTRATION                        |
- PS 374 | *SUSTAINABLE LIVING: PRACTICES AND POLICIES  |
- PS 449 | *TOPICS IN COMPARATIVE POLITICS              |
- PS 455 | *THE POLITICS OF CLIMATE CHANGE             |
- PS 461 | ENVIRONMENTAL POLITICAL THEORY               |
- PS 470 | GLOBAL FOOD POLITICS AND POLICY             |
- PS 473 | US ENERGY POLICY                            |
- PS 475 | ENVIRONMENTAL POLITICS AND POLICY           |
- PS 476 | *SCIENCE AND POLITICS                        |
- PS 477 | INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY |
- PS 478 | RENEWABLE ENERGY POLICY                      |

**Upper-Division Non-Political Science Courses**

- ECON 352/AEC 352 | *ENVIRONMENTAL ECONOMICS AND POLICY          |
- ECON 466 | *ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY |
- FES 485 | *CONSENSUS AND NATURAL RESOURCES             |
- SOC 381 | SOCIAL DIMENSIONS OF SUSTAINABILITY          |
- SOC 456 | *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT    |
- SOC 475 | RURAL SOCIOLOGY                             |
- SOC 480 | *ENVIRONMENTAL SOCIOLOGY                     |
- SOC 481 | *SOCIETY AND NATURAL RESOURCES               |

Select one of the following: 4

- Upper-division course from the list above
- Upper-division PS course not on the list

**Total Hours: 28**

---

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Minor Code: 960**
Political Science Undergraduate Major (BA, BS, HBA, HBS)

Also available via Ecampus.

Political Science is the systematic study of politics wherever it takes place—in governmental institutions, the international arena, and civil society. Political science majors at Oregon State may choose the general political science major, or one of the three options that focus on law and politics, international affairs, or environmental and energy politics. All political science majors learn to think critically, write clearly and speak persuasively. They learn the ideas of great political thinkers, learn the political fundamentals behind the headlines, and have engaging discussions from all points of view with other students and professors.

Major Code: 960

Students selecting the Political Science major must complete 52 credits of political science course work, of which at least 36 credits must be upper-division courses. As part of these overall credit totals, Political Science majors must complete:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baccalaureate Core</td>
<td>Select 51 credits</td>
<td></td>
</tr>
<tr>
<td>Foundation Courses</td>
<td>Select three of the following:</td>
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</tr>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 204</td>
<td>*INTRODUCTION TO COMPARATIVE POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td></td>
</tr>
<tr>
<td>PS 206</td>
<td>*INTRODUCTION TO POLITICAL THOUGHT</td>
<td></td>
</tr>
<tr>
<td>Methods/WIC</td>
<td>PS 300</td>
<td>*RESEARCH METHODS</td>
</tr>
<tr>
<td>Upper-Division Subfield Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one from at least three of the four following subfields:</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Subfield 1: American national government and politics, to include the judiciary, state and local government, public policy, public administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS 311</td>
<td>CONGRESSIONAL POLITICS</td>
<td></td>
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<tr>
<td>PS 312</td>
<td>PRESIDENTIAL POLITICS</td>
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<tr>
<td>PS 313</td>
<td>CAMPAIGNS AND ELECTIONS</td>
<td></td>
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<tr>
<td>PS 314</td>
<td>INTEREST GROUP POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 315</td>
<td>*THE POLITICS OF MEDIA</td>
<td></td>
</tr>
<tr>
<td>PS 317</td>
<td>GENDER AND POLITICS</td>
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</tr>
<tr>
<td>PS 321</td>
<td>CONSTITUTIONAL LAW: GOVERNMENT POWERS AND CONSTRAINTS</td>
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<tr>
<td>PS 322</td>
<td>*CONSTITUTIONAL LAW: CIVIL RIGHTS AND LIBERTIES</td>
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<tr>
<td>PS 323</td>
<td>CONSTITUTIONAL LAW: RIGHTS OF THE ACCUSED</td>
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</tr>
<tr>
<td>PS 326</td>
<td>JUDICIAL PROCESS AND POLITICS</td>
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<tr>
<td>PS 328</td>
<td>SPORTS AND POLITICS</td>
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<tr>
<td>PS 331</td>
<td>*STATE AND LOCAL POLITICS</td>
<td></td>
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<tr>
<td>PS 371</td>
<td>PUBLIC POLICY PROBLEMS</td>
<td></td>
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<tr>
<td>PS 374</td>
<td>*SUSTAINABLE LIVING: PRACTICES AND POLICIES</td>
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<tr>
<td>PS 375</td>
<td>*THE CIVIL RIGHTS MOVEMENT AND POLICIES</td>
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<tr>
<td>PS 425</td>
<td>*GENDER AND THE LAW</td>
<td></td>
</tr>
<tr>
<td>PS 455</td>
<td>*THE POLITICS OF CLIMATE CHANGE</td>
<td></td>
</tr>
<tr>
<td>PS 472</td>
<td>US ENERGY POLICY</td>
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<tr>
<td>PS 475</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>PS 476</td>
<td>*SCIENCE AND POLITICS</td>
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<tr>
<td>PS 477</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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</tr>
<tr>
<td>PS 478</td>
<td>RENEWABLE ENERGY POLICY</td>
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</tbody>
</table>

Subfield 2: Comparative politics

| PS 341 | *EUROPEAN AND EU POLITICS | |
| PS 343 | *RUSSIAN POLITICS | |
| PS 344 | *LATIN AMERICAN POLITICS | |
| PS 345 | *POLITICS OF DEVELOPING NATIONS | |
| PS 348 | *CHINESE POLITICS | |
| PS 350 | *JAPANESE POLITICS | |
| PS 441 | DEMOCRATIZATION | |
| PS 446 | EAST ASIAN POLITICAL ECONOMY | |
| PS 449 | *TOPICS IN COMPARATIVE POLITICS | |
| Subfield 3: International relations | PS 351 | AMERICAN FOREIGN POLICY | |
| PS 356 | INTERNATIONAL POLITICS OF ASIA PACIFIC | |
| PS 454 | INTERNATIONAL LAW AND ORGANIZATIONS | |
| PS 455 | *THE POLITICS OF CLIMATE CHANGE | |
| PS 457 | US-CHINA RELATIONS | |
| PS 458 | *INTERNATIONAL POLITICAL ECONOMY | |
| PS 470 | GLOBAL FOOD POLITICS AND POLICY | |
| PS 477 | INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY | |
| Subfield 4: Political philosophy | PS 361 | CLASSICAL POLITICAL THOUGHT | |
| PS 362 | MODERN POLITICAL THOUGHT | |
| PS 363 | *GENDER AND RACE IN AMERICAN POLITICAL THOUGHT | |
| PS 365 | AMERICAN POLITICAL THOUGHT | |
| PS 461 | ENVIRONMENTAL POLITICAL THEORY | |
| PS 462 | THEORIES OF LAW | |

Additional Upper-Division PS Courses | 24 |

Total credits required for graduation 180

* Bacc Core Course
^ Writing Intensive Course (WIC)

1. Foundation Courses

The school encourages students to take the foundation courses in their first or second year.

Students who choose to specialize in one of the options for the major are required to take two of the introductory courses as specified for the option and choose the third introductory course.

Few upper-division political science courses have enforced prerequisites, but taking the corresponding intro course is often good preparation (for example, PS 201 would assist with PS 321).

II. Methods/WIC

The research methods and WIC course. The school encourages students to take the Methods/WIC course late in their second or early in their third year.

III. Upper-Division Subfield Courses

A. For the general major, students must take one course each from at least three of the four subfields.

B. For the options, students choose from a list of courses approved for the option.

IV. Potential for Specialization

Students may choose a general political science major or may choose from one of three transcript-visible options:

1. Environmental and Energy Politics
2. International Affairs
3. Law and Politics
V. Potential for Learning Outside the Classroom.
Political science majors are strongly encouraged to pursue experiential learning and other educational opportunities outside of the classroom, and these experiences can be used to fulfill some political science graduation requirements. Such experiences can include research, thesis writing, projects, or internship. Credits will be placed in the appropriate PS 401 RESEARCH AND SCHOLARSHIP–PS 410 POLITICAL SCIENCE INTERNSHIP designator. A maximum of 8 credits from any combination of PS 401 RESEARCH AND SCHOLARSHIP–PS 410 POLITICAL SCIENCE INTERNSHIP may be applied to the major, although additional credits from courses in this range may be applied to general graduation requirements. Additional experiential learning opportunities include ‘field schools’ and study abroad. Students should discuss all of these opportunities with the political science undergraduate advisor.

VI. Additional Requirements for the Major
• Majors are required to maintain a minimum cumulative 2.00 grade-point average for all political science course work.
• Majors must earn a C– grade or better in PS 300.
• Students must complete the BA or BS requirements specified by the College of Liberal Arts.

Major Code: 960

Environmental and Energy Politics Option

This option is offered within the following major(s):
• Political Science - College of Liberal Arts (p. 789)

The Environmental and Energy Politics option under the Political Science major provides students with the opportunity to focus their undergraduate studies on topics involving:
• Historical and contemporary environmental problems
• Governmental and non-governmental efforts to address problems at the local, state, federal and international levels
• Interactions between key actors and institutions involved in environmental policymaking in the United States and internationally

Option Code: 691

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
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<tr>
<td>PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td>4</td>
</tr>
<tr>
<td>PS 204</td>
<td>*INTRODUCTION TO COMPARATIVE POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>or PS 206</td>
<td>*INTRODUCTION TO POLITICAL THOUGHT</td>
<td></td>
</tr>
<tr>
<td>Methods/WIC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS 300</td>
<td>*RESEARCH METHODS</td>
<td>4</td>
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<tr>
<td>Upper-Division Option Courses</td>
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<tr>
<td>Select at least 16 credits of the following:</td>
<td>16</td>
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<tr>
<td>PS 314</td>
<td>INTEREST GROUP POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 331</td>
<td>*STATE AND LOCAL POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 371</td>
<td>PUBLIC POLICY PROBLEMS</td>
<td></td>
</tr>
<tr>
<td>PS 372</td>
<td>PUBLIC ADMINISTRATION</td>
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<tr>
<td>PS 374</td>
<td>*SUSTAINABLE LIVING: PRACTICES AND POLICIES</td>
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<tr>
<td>PS 449</td>
<td>*TOPICS IN COMPARATIVE POLITICS</td>
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<tr>
<td>PS 455</td>
<td>*THE POLITICS OF CLIMATE CHANGE</td>
<td></td>
</tr>
<tr>
<td>PS 461</td>
<td>ENVIRONMENTAL POLITICAL THEORY</td>
<td></td>
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PS 470 GLOBAL FOOD POLITICS AND POLICY
PS 473 US ENERGY POLICY
PS 475 ENVIRONMENTAL POLITICS AND POLICY
PS 476 *SCIENCE AND POLICS
PS 477 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
PS 478 RENEWABLE ENERGY POLICY
Select up to 8 credits of the following: 8
ECON 352/AEC 352 *ENVIRONMENTAL ECONOMICS AND POLICY
ECON 466 *ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY
FES 485 *CONSSENSUS AND NATURAL RESOURCES
SOC 381 SOCIAL DIMENSIONS OF SUSTAINABILITY
SOC 456 *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT
SOC 475 RURAL SOCIOLOGY
SOC 480 *ENVIRONMENTAL SOCIOLOGY
SOC 481 *SOCIETY AND NATURAL RESOURCES

Potential for Learning Outside the Classroom
Political science majors are strongly encouraged to pursue experiential learning and other educational opportunities outside of the classroom, and these experiences can be used to fulfill some political science graduation requirements. Such experiences can include research, thesis writing, projects, or internship. Credits will be placed in the appropriate PS 401 – PS 410 designator. A maximum of 8 credits from any combination of PS 401 – PS 410 may be applied to the major, although additional credits from courses in this range may be applied to general graduation requirements. Additional experiential learning opportunities include ‘field schools’ and study abroad. Students should discuss all of these opportunities with the political science undergraduate advisor.

Option Code: 691

International Affairs Option

This option is offered within the following major(s):
• Political Science - College of Liberal Arts (p. 789)

The International Affairs option provides students with the opportunity to focus their undergraduate studies on topics involving:
• The political systems and dynamics of different countries and regions around the world
• Relations among countries and non-state actors
• Global issues, problems, and institutions

Option Code: 471

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 204</td>
<td>*INTRODUCTION TO COMPARATIVE POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td>4</td>
</tr>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>or PS 206</td>
<td>*INTRODUCTION TO POLITICAL THOUGHT</td>
<td></td>
</tr>
</tbody>
</table>

Research Methods/WIC

PS 300 | *RESEARCH METHODS                      | 4     |

Upper-Division Option Courses

Select at least 16 credits of the following: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 341</td>
<td>*EUROPEAN AND EU POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 343</td>
<td>RUSSIAN POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 344</td>
<td>LATIN AMERICAN POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 345</td>
<td>*POLITICS OF DEVELOPING NATIONS</td>
<td></td>
</tr>
<tr>
<td>PS 348</td>
<td>*CHINESE POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 350</td>
<td>*JAPANESE POLITICS</td>
<td></td>
</tr>
<tr>
<td>PS 351</td>
<td>AMERICAN FOREIGN POLICY</td>
<td></td>
</tr>
<tr>
<td>PS 356</td>
<td>INTERNATIONAL POLITICS OF ASIA PACIFIC</td>
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<tr>
<td>PS 441</td>
<td>DEMOCRATIZATION</td>
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</tr>
<tr>
<td>PS 446</td>
<td>EAST ASIAN POLITICAL ECONOMY</td>
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</tr>
<tr>
<td>PS 454</td>
<td>INTERNATIONAL LAW AND ORGANIZATIONS</td>
<td></td>
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<tr>
<td>PS 455</td>
<td>*THE POLITICS OF CLIMATE CHANGE</td>
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<tr>
<td>PS 457</td>
<td>US-CHINA RELATIONS</td>
<td></td>
</tr>
<tr>
<td>PS 458</td>
<td>*INTERNATIONAL POLITICAL ECONOMY</td>
<td></td>
</tr>
<tr>
<td>PS 470</td>
<td>GLOBAL FOOD POLITICS AND POLICY</td>
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<tr>
<td>PS 477</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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</table>

PS 470 | DEMOCRATIZATION                           |       |

Select up to 8 credits of the following: 8

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ECON 340</td>
<td>INTERNATIONAL ECONOMICS</td>
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</tr>
<tr>
<td>ECON 440</td>
<td>ECONOMICS OF GLOBALIZATION</td>
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<tr>
<td>ECON 441</td>
<td>INTERNATIONAL FINANCE THEORY AND POLICY</td>
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</tr>
<tr>
<td>ECON 455</td>
<td>ECONOMIC DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>SOC 360</td>
<td>*POPULATION TRENDS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>SOC 460</td>
<td>THE SOCIOLOGY OF GLOBALIZATION</td>
<td></td>
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</tbody>
</table>

Political Science Electives

Select 12 credits 2

Total Hours: 52

1 16 to 24 credits from the political science courses listed. Up to 8 upper-division credits can come from classes listed in economics and sociology. Credits from all courses must add up to at least 24. Other courses applied to this total must be approved by the department.

2 Any political science courses may be taken to reach the minimum of 52 total credits in the major with at least 36 of these at the upper-division level.

* Baccalaureate Core Course (BCC). Major courses cannot double count for Baccalaureate Core requirements.

^ Writing Intensive Course (WIC)

Potential for Learning Outside the Classroom

Political science majors are strongly encouraged to pursue experiential learning and other educational opportunities outside of the classroom, and these experiences can be used to fulfill some political science graduation requirements. Such experiences can include research, thesis writing, projects, or internship. Credits will be placed in the appropriate PS 401 – PS 410 designator. A maximum of 8 credits from any combination of PS 401 – PS 410 may be applied to the major, although additional credits from courses in this range may be applied to general graduation requirements. Additional experiential learning opportunities include ‘field schools’ and study abroad. Students should discuss all of these opportunities with the political science undergraduate advisor.

Option Code: 471

Law and Politics Option

This option is offered within the following major(s):

• Political Science - College of Liberal Arts (p. 789)

The Law and Politics option offers students the opportunity to focus their undergraduate studies on topics involving:

• Constitutional principles and interpretation
• Judicial politics and how it shapes the law
• Relationships between the various branches and levels of government in the United States
• Normative arguments regarding justice and equality in theory and in practice

Option Code: 634

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 206</td>
<td>*INTRODUCTION TO POLITICAL THOUGHT</td>
<td>4</td>
</tr>
<tr>
<td>PS 204</td>
<td>*INTRODUCTION TO COMPARATIVE POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>or PS 205</td>
<td>*INTRODUCTION TO INTERNATIONAL RELATIONS</td>
<td></td>
</tr>
</tbody>
</table>

Methods/WIC

PS 300 | *RESEARCH METHODS                      | 4     |

Upper-Division Option Courses

Select at least 16 credits of the following: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PS 311</td>
<td>CONGRESSIONAL POLITICS</td>
<td></td>
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<tr>
<td>PS 312</td>
<td>PRESIDENTIAL POLITICS</td>
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<tr>
<td>PS 321</td>
<td>CONSTITUTIONAL LAW: GOVERNMENT POWERS AND CONSTRAINTS</td>
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<tr>
<td>PS 322</td>
<td>*CONSTITUTIONAL LAW: CIVIL RIGHTS AND LIBERTIES</td>
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<td>PS 323</td>
<td>CONSTITUTIONAL LAW: RIGHTS OF THE ACCUSED</td>
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<td>PS 361</td>
<td>CLASSICAL POLITICAL THOUGHT</td>
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<td>PS 363</td>
<td>*GENDER AND RACE IN AMERICAN POLITICAL THOUGHT</td>
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<td>PS 371</td>
<td>PUBLIC POLICY PROBLEMS</td>
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<tr>
<td>PS 372</td>
<td>PUBLIC ADMINISTRATION</td>
<td></td>
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<tr>
<td>PS 375</td>
<td>*THE CIVIL RIGHTS MOVEMENT AND POLICIES</td>
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<tr>
<td>PS 425</td>
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<tr>
<td>PS 454</td>
<td>INTERNATIONAL LAW AND ORGANIZATIONS</td>
<td></td>
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<tr>
<td>PS 462</td>
<td>THEORIES OF LAW</td>
<td></td>
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</table>

Select up to 8 credits of the following: 8

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ECON 461</td>
<td>LAW, ECONOMICS, AND REGULATION</td>
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</tr>
<tr>
<td>SOC 340</td>
<td>DEVIANT BEHAVIOR AND SOCIAL CONTROL</td>
<td></td>
</tr>
<tr>
<td>SOC 440</td>
<td>JUVENILE DELINQUENCY</td>
<td></td>
</tr>
</tbody>
</table>
The Public Policy Graduate Program accepts students with backgrounds in related academic disciplines. The degrees are designed to provide individuals with analytic skills, an understanding of public policy processes, and substantive knowledge in a specific policy area.

To see details outlined in a brochure, visit the Public Policy website (http://liberalarts.oregonstate.edu/spp/graduate-programs-public-policy/).

For more information, contact:
Andrew Valls, Interim Director, School of Public Policy
Email: andrew.valls@oregonstate.edu (denise.lach@oregonstate.edu)

Professor Brent Steel, Graduate Program Director
318 Bexell Hall
Oregon State University
Corvallis, OR 97331-6206
Phone: 541-737-2811
Fax: 541-737-2289
Email: bsteel@oregonstate.edu

Major Code: 9570

MPP

The Master of Public Policy is a professional degree intended to prepare students for careers in the public, nonprofit, and international sectors and offer training for in-service students desiring professional growth and advancement. The degree is designed to be a generalist program, with an emphasis on analytic skills and policy knowledge. The degree requires a minimum of 62 graduate credits, 44 of which are in the required core. The core curriculum provides an important foundation in statistics, research methods, computer applications, public policy analysis, public administration and ethics, and economics. The remaining 18 credits support the student’s preferred area of concentration, consisting of environmental policy, international policy, rural policy, science policy, or social policy. Students with little work experience in public service, the nonprofit sector, or the international context will be required to engage in a supervised internship that will allow them to work closely with experienced mentors who will help them integrate theory with practice and introduce them to a professional network. Students with relevant work experience will substitute course work for internship credits. A final oral examination is required.

**Public Policy Graduate Major (EMPP, MPP, PhD)**

**Graduate Areas of Concentration**

*Energy policy; environmental policy; international policy; law, crime, and policy; rural policy; science and technology policy; social policy*

**EMPP and MPP available via Ecampus.**

Oregon State University offers graduate programs in public policy to students interested in energy policy, environmental policy; international policy, law, crime, and policy; rural policy; science and technology policy; and/or social policy. The degrees are granted by the College of Liberal Arts and provide graduate education for students wishing to develop their interests and careers in the public and nonprofit sectors.

The EMPP is designed for mid-career professionals in the public sector who are interested in moving up in their positions or who are looking to transition from the private sector to a career in public service. The Master of Public Policy (MPP) specifically prepares students for careers in domestic and international organizations or preparation for PhD studies. The PhD in Public Policy prepares students for academic or non-academic research careers in the public, private, and nongovernmental sectors.

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**Potential for Learning Outside the Classroom**

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**Option Code: 634**

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**EMPP**

**Core Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
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<tr>
<td>PPOL 507</td>
<td>Seminar</td>
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<tr>
<td>PPOL 511</td>
<td>Public Organizations and Leadership</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 521</td>
<td>Understanding Social Research</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 522</td>
<td>Quantitative Methods for Public Policy Analysis</td>
<td>4</td>
</tr>
<tr>
<td>or PPOL 523</td>
<td>Qualitative Research Methods</td>
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<tr>
<td>PPOL 524</td>
<td>Applied Research Methods</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 512</td>
<td>Public Policy Theory</td>
<td>4</td>
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</tbody>
</table>

**Concentration Courses**

- Total Credits: 16
- Applied Policy Capstone Project: 4

**Total Hours**: 45
EMPP students can select a focus in one of several established concentrations or graduate certificate programs, or self-design a concentration with an advisor and with the approval of the OSU Public Policy Graduate Program Director. All concentrations and graduate certificates require at least 16 quarter credits. Students can take concentration and elective courses from a variety of approved programs and colleges across OSU curriculum and relevant PSU online courses. In addition, both OSU and PSU intend to develop additional concentrations and graduate certificates in the future that meet student and community needs (e.g., intersection of rural-urban policy, etc.). Each concentration and/or certificate has a faculty advisor to help students identify appropriate courses and committee members.

**Major Code: 9570**

**Public Policy Undergraduate Major (BS, HBS)**

Also available via Ecampus.

The discipline of public policy is closely connected to the practice of policy and this program ensures that students interact with policy-makers as well as the knowledge-producers who support policy decisions. Graduates of the BSPP will have the skills necessary for understanding the political, economic, and social constraints faced by policy makers, assessing the performance of alternative approaches to policy implementation, evaluating the effectiveness of policies, and appreciating the sharp conflicts in fundamental human values that animate critical policy debates. The Public Policy Major will provide students with a set of research, analytical, and management skills that will be transferable across sectors and across issue areas. The undergraduate program will prepare graduates for a career not only in public service (federal, state, and local government), but also in not-for-profit and for-profit organizations, as well as admissions to competitive graduate programs in a wide range of programs through which they may further broaden their intellectual and practical experience and expertise.

The BSPP is designed with an emphasis on substantive interdisciplinary knowledge about important policy issues, analytic skills, and policy practice. Students will have the opportunity to pursue their individual interests and passion in specialization areas, each of which is supported by a wealth of experience and expertise in both the School of Public Policy and across the OSU campus. In addition, the degree requires a supervised practicum with a public, non-profit, private, or international organization.

**Major Code: 801**

Students will apply for the Public Policy major after completing an equivalent of 90 quarter credits at an accredited university (typically two years of full-time study). Students are encouraged to complete as much of the OSU Baccalaureate core and College of Liberal Arts (CLA) requirements as possible during that time period. Prior to submission of an application, students will be required to take and complete successfully (GPA of 3.0 or higher) four courses, each of which is a prerequisite for subsequent courses in the program.

### Public Policy BS Prerequisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 201</td>
<td>*INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
<td>4</td>
</tr>
<tr>
<td>or ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
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</tr>
<tr>
<td>or ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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</tr>
</tbody>
</table>

**Total Hours:** 15

### Program Course Requirements

**Pre-Policy, including Policy Prerequisites**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 331</td>
<td>*STATE AND LOCAL POLITICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 371</td>
<td>PUBLIC POLICY PROBLEMS</td>
<td>4</td>
</tr>
<tr>
<td>PS 372</td>
<td>PUBLIC ADMINISTRATION</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 413</td>
<td>ETHICS IN PUBLIC POLICY</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE</td>
<td>2</td>
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Select one from below:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ECON 435</td>
<td>PUBLIC ECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>PS 458</td>
<td>*INTERNATIONAL POLITICAL ECONOMY</td>
<td></td>
</tr>
<tr>
<td>SOC 360</td>
<td>*POPULATION TRENDS AND POLICY</td>
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</tbody>
</table>

**Public Policy Core**

**Public Policy Methods**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PPOL 421</td>
<td>INTRODUCTION TO POLICY RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 422</td>
<td>POLICY ANALYSIS</td>
<td>4</td>
</tr>
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</table>

**Public Policy Specialization Methods**

Select one of 3 specialization areas:

### Environmental Policy Specialization Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>AEC 253</td>
<td>*ENVIRONMENTAL LAW, POLICY, AND ECONOMICS</td>
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</tr>
<tr>
<td>AEC 432</td>
<td>ENVIRONMENTAL LAW</td>
<td></td>
</tr>
<tr>
<td>ECON 352</td>
<td>*ENVIRONMENTAL ECONOMICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>ECON 439</td>
<td>*PUBLIC POLICY ANALYSIS</td>
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<tr>
<td>ECON 466</td>
<td>*ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY</td>
<td></td>
</tr>
<tr>
<td>FES 485</td>
<td>*CONSSENSUS AND NATURAL RESOURCES</td>
<td></td>
</tr>
<tr>
<td>FOR 460</td>
<td>*FOREST POLICY</td>
<td></td>
</tr>
<tr>
<td>FOR 462</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
<td></td>
</tr>
<tr>
<td>FW 323</td>
<td>MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST</td>
<td></td>
</tr>
<tr>
<td>FW 326</td>
<td>INTEGRATED WATERSHED MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>FW 340</td>
<td>MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES</td>
<td></td>
</tr>
<tr>
<td>FW 350</td>
<td>*ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY</td>
<td></td>
</tr>
<tr>
<td>FW 415</td>
<td>FISHERIES AND WILDLIFE LAW AND POLICY</td>
<td></td>
</tr>
<tr>
<td>FW 422</td>
<td>INTRODUCTION TO OCEAN LAW</td>
<td></td>
</tr>
<tr>
<td>GEO 309</td>
<td>*ENVIRONMENTAL JUSTICE</td>
<td></td>
</tr>
<tr>
<td>PHL 440</td>
<td>*ENVIRONMENTAL ETHICS</td>
<td></td>
</tr>
<tr>
<td>PS 361</td>
<td>CLASSICAL POLITICAL THOUGHT</td>
<td></td>
</tr>
<tr>
<td>PS 374</td>
<td>*SUSTAINABLE LIVING: PRACTICES AND POLICIES</td>
<td></td>
</tr>
<tr>
<td>PS 455</td>
<td>*THE POLITICS OF CLIMATE CHANGE</td>
<td></td>
</tr>
<tr>
<td>PS 470</td>
<td>GLOBAL FOOD POLITICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>PS 473</td>
<td>US ENERGY POLICY</td>
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<tr>
<td>PS 475</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>PS 476</td>
<td>*SCIENCE AND POLITICS</td>
<td></td>
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<tr>
<td>PS 478</td>
<td>RENEWABLE ENERGY POLICY</td>
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<tr>
<td>SOC 381</td>
<td>SOCIAL DIMENSIONS OF SUSTAINABILITY</td>
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<tr>
<td>SOC 480</td>
<td>*ENVIRONMENTAL SOCIOLOGY</td>
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<tr>
<td>SOC 481</td>
<td>*SOCIETY AND NATURAL RESOURCES</td>
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<tr>
<td>WGIS 440</td>
<td>WOMEN AND NATURAL RESOURCES</td>
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### Rural Policy Specialization Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>AEC 240</td>
<td>*RURAL ECONOMICS OF PLACE AND PEOPLE</td>
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<tr>
<td>AEC 288</td>
<td>AGRICULTURAL LAW</td>
<td></td>
</tr>
<tr>
<td>AEC 421</td>
<td>ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET</td>
<td></td>
</tr>
<tr>
<td>AEC 454</td>
<td>RURAL DEVELOPMENT ECONOMICS AND POLICY</td>
<td></td>
</tr>
</tbody>
</table>
Students will apply for the Public Policy major after completing an equivalent of 90 quarter credits at an accredited university (typically two years of full-time study). Students will be encouraged to complete as much of the OSU Baccalaureate core and College of Liberal Arts (CLA) requirements as possible during that time period. Prior to submission of an application, students will be required to take and complete successfully (GPA of 3.0 or higher) 4 courses, each of which is a prerequisite for subsequent courses in the Public Policy major.
Winter
PPOL 409 PRACTICUM/CLINICAL EXPERIENCE (Pending approval) 2
PPOL 422 *POLICY ANALYSIS (Pending approval) 4
PS 372 PUBLIC ADMINISTRATION 4
BSPP Specialization Area Course 4

Hours 14

Spring
BSPP Specialization Area Course 4
General Elective 4
General Elective 4
General Elective 4

Hours 16

Fourth Year
Fall
ECON 435 PUBLIC ECONOMICS 4
or PS 458 or *INTERNATIONAL POLITICAL ECONOMY 4
or SOC 360 or *POPULATION TRENDS AND POLICY 4
PPOL 413 ETHICS IN PUBLIC POLICY 4
BSPP Specialization Area Course 4
General Elective 4

Hours 16

Winter
BSPP Practice 5
BSPP Capstone 5
BSPP Specialization Area Course 4

Hours 14

Spring
BSPP Specialization Area Course 4
BSPP Specialization Area Course 4
General Elective 4
General Elective 4

Hours 16

Total Hours 181-182

Rural Policy Graduate Certificate
Available only via Ecampus.

This online certificate will prepare students with the skills and competencies needed to understand economic, social, political and cultural dynamics of rural places, and to design and evaluate rural policy as it pertains to Oregon and other contexts. Rooted in Sociology, Economics, Political Science, and various natural resource sciences, students will gain valuable inter-disciplinary insights into complex challenges facing rural places.

Certificate Code: CG21

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPOL 552</td>
<td>INTERNATIONAL COMPARATIVE RURAL POLICY</td>
<td>4</td>
</tr>
<tr>
<td>SOC 539</td>
<td>WELFARE AND SOCIAL SERVICES</td>
<td>4</td>
</tr>
<tr>
<td>PPOL 501</td>
<td>RESEARCH AND SCHOLARSHIP</td>
<td>2</td>
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<tr>
<td>Additional Electives</td>
<td>Select 8 credits from the following:</td>
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</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>AEC 521</td>
<td>ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET</td>
<td></td>
</tr>
<tr>
<td>AEC 534</td>
<td>ENVIRONMENTAL AND RESOURCE ECONOMICS</td>
<td></td>
</tr>
<tr>
<td>AEC 554</td>
<td>RURAL DEVELOPMENT ECONOMICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>ANTH 581</td>
<td>NATURAL RESOURCES AND COMMUNITY VALUES</td>
<td></td>
</tr>
<tr>
<td>PS 575</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
<td></td>
</tr>
<tr>
<td>RS 521</td>
<td>ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 18

1 Other courses may be petitioned by students and approved by the Certificate Coordinator

Certificate Code: CG21

Sociology Graduate Minor

Graduate Areas of Concentration
Environmental and natural resources, international sociology, social policy

Sociology in the School of Public Policy serves as major and minor fields in the Master of Arts in Interdisciplinary Studies degree program and participates as a minor field in other advanced degree programs. The MAIS program is designed to meet the particular needs and interests of the individual student and features collaborative work in any two other pertinent departments.

Further information can be obtained by writing the School of Public Policy, 300 Bexell Hall, OSU, Corvallis, OR 97331-3703

Minor Code: 9800

Minor Code: 9800

Sociology Minor

Also available via Ecampus.

Undergraduate students may elect a Sociology minor to complement coursework in their major discipline.

Minor Code: 980

Transfer students may apply a maximum of 12 credits of lower-division sociology credits toward the Sociology minor.

A minimum GPA of 2.00 must be earned in sociology coursework.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 204</td>
<td>*INTRODUCTION TO SOCIOLOGY (Prerequisite to all 3 upper-division courses)</td>
<td></td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>SOC 340</td>
<td>DEVIANT BEHAVIOR AND SOCIAL CONTROL</td>
<td></td>
</tr>
<tr>
<td>SOC 418</td>
<td>QUALITATIVE RESEARCH METHODS</td>
<td></td>
</tr>
<tr>
<td>SOC 424</td>
<td>SOCIAL PSYCHOLOGY</td>
<td></td>
</tr>
<tr>
<td>SOC 426</td>
<td>*SOCIAL INEQUALITY (Also offered online via Ecampus)</td>
<td></td>
</tr>
<tr>
<td>SOC 450</td>
<td>SOCIOLOGY OF EDUCATION (Also offered online via Ecampus )</td>
<td></td>
</tr>
<tr>
<td>SOC 452</td>
<td>SOCIOLOGY OF RELIGION</td>
<td></td>
</tr>
<tr>
<td>SOC 456</td>
<td>*SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT (Also offered online via Ecampus )</td>
<td></td>
</tr>
</tbody>
</table>

A maximum of 12 credits of lower-division courses 12

A maximum of 3 credits from SOC 401 to SOC 410 3
Sociology Undergraduate Major (BA, BS, HBA, HBS)

Also available via Ecampus.

Sociology is the study of human social behavior and sociologists examine interactions within and between groups and resulting social institutions. The undergraduate program in sociology provides a general analysis and broad understanding of human societies and culture for persons in all fields. Selecting courses around a topic or theme of interest adds meaning to one’s education and strengthens the base of understanding from which one can pursue a career or further education. There are currently two options for both Corvallis campus students and Ecampus students to choose from: Crime and Justice, and Environmental and Natural Resources.

Major Code: 980

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baccalaureate Core Course</td>
<td>Select 51 credits</td>
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<tr>
<td></td>
<td>Core</td>
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</tr>
<tr>
<td>SOC 204</td>
<td>*INTRODUCTION TO SOCIOLOGY (Prereq. to all upper-division sociology courses) Also offered via Ecampus</td>
<td>3</td>
</tr>
<tr>
<td>SOC 315</td>
<td>*METHODS I: RESEARCH DESIGN (Also offered via Ecampus.)</td>
<td>4</td>
</tr>
<tr>
<td>SOC 316</td>
<td>METHODS II: QUANTITATIVE ANALYSIS (Also offered via Ecampus.)</td>
<td>4</td>
</tr>
<tr>
<td>SOC 413</td>
<td>SOCIOLOGICAL THEORY (Also offered via Ecampus.)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sociology Electives</td>
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</tr>
<tr>
<td></td>
<td>Select 33 credits</td>
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<td></td>
<td>Total credits required for graduation</td>
<td>180</td>
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</table>

1. Minimum of 12 at lower division.
2. Maximum of 8 credits in courses numbered SOC 401 to SOC 410.
3. Baccalaureate Core Course (BCC)
4. Writing Intensive Course (WIC)

Transfer students may apply a maximum of 12 credits of lower-division sociology credits toward a degree in sociology.

A minimum grade-point average of 2.50 must be earned in sociology course work. A grade of C– or above is required in SOC 315, SOC 316, and SOC 413.

Major Code: 980

Crime and Justice Option

This option is offered within the following major(s):

- Sociology - College of Liberal Arts (p. 796)

Also available via Ecampus.

The Crime and Justice option provides students with the ability to apply social science concepts and approaches to better understand and analyze relationships between crime, justice, and public policy from a sociological perspective. The option has particular relevance for sociology students aspiring to careers in criminal justice, law, or social services, as well as those preparing for advanced/graduate programs in criminology, criminal justice, or public policy. Academic internships are available in local criminal justice and social service agencies, offering a unique combination of scholarly analysis and practical experience for students seeking careers in fields such as law, policing, corrections, and social work.

Option Code: 995

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>SOC 241</td>
<td>INTRODUCTION TO CRIME AND JUSTICE</td>
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</tr>
<tr>
<td>SOC 340</td>
<td>DEVIANT BEHAVIOR AND SOCIAL CONTROL</td>
<td></td>
</tr>
<tr>
<td>SOC 410</td>
<td>INTERNSHIP</td>
<td></td>
</tr>
<tr>
<td>SOC 440</td>
<td>JUVENILE DELINQUENCY</td>
<td></td>
</tr>
<tr>
<td>SOC 441</td>
<td>CRIMINOLOGY AND PENALOGY</td>
<td></td>
</tr>
<tr>
<td>SOC 442</td>
<td>SOCIOLOGY OF DRUG USE AND ABUSE</td>
<td></td>
</tr>
<tr>
<td>SOC 444</td>
<td>INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION</td>
<td></td>
</tr>
<tr>
<td>SOC 448</td>
<td>LAW AND SOCIETY</td>
<td></td>
</tr>
<tr>
<td>SOC 449</td>
<td>LAW, CRIME, AND POLICY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>23</td>
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</tbody>
</table>

1. Internship placement must be in crime, law or related field to count for option. Major paper required for 2+ credits.

Option Code: 995

Environmental and Natural Resource Sociology Option

This option is offered within the following major(s):

- Sociology - College of Liberal Arts (p. 796)

Also available via Ecampus.

The option is designed to provide students with the ability to apply social science concepts and approaches to better understand relationships between societies and their bio-physical environment from a sociological perspective. This option has great relevance for sociology students aspiring to careers in natural resource and environmental policy, planning, management, and education, as well as preparation for advanced/graduate programs related to environmental law and environment/natural resource sociology or policy.

Option Code: 642

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>SOC 480</td>
<td>*ENVIRONMENTAL SOCIOLOGY (Also offered online via Ecampus)</td>
<td>4</td>
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<tr>
<td>SOC 481</td>
<td>*SOCIETY AND NATURAL RESOURCES (Also offered online via Ecampus)</td>
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<tr>
<td></td>
<td>Elective Courses</td>
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<td>Select 13 credits of the following:</td>
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<tr>
<td>FES 485</td>
<td>*CONSENSUS AND NATURAL RESOURCES (FW 485 &amp; SOC 485)</td>
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</tr>
<tr>
<td>SOC 350</td>
<td>*POPULATION TRENDS AND POLICY (Also offered online via Ecampus)</td>
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</tr>
</tbody>
</table>
School of Writing, Literature and Film

The School of Writing, Literature, and Film offers instruction in literary studies, writing (creative, critical, professional/technical), and critical film studies to students in all disciplines who seek the cultural and intellectual values of the humanities and arts, as well as the broadening influence of humanistic studies, creative expression, cultural studies, and writing for the professions. In addition, the school provides courses for those interested in the minor or major in English, especially for those who plan to teach in the elementary, secondary, or college professions, or who plan to pursue graduate work in English, writing, or film. The Writing minor, which is also offered via Ecampus (http://ecampus.oregonstate.edu/ online-degrees/undergraduate/writing/), serves students interested in creative writing and/or writing for the scientific and/or technical and professional fields.

Minor Programs

The minor in English allows students to concentrate in the area of the liberal arts and develop the reading and writing skills often demanded by employers. Students taking a minor in English choose from among three areas: general English studies, English literature, and American literature.

Graduate Programs

The School of Writing, Literature, and Film offers graduate work leading to a Master of Arts degree in English. The major area of concentration may be in literature and culture, or rhetoric, writing, and culture. The school also offers the Master of Fine Arts degree in Creative Writing. Graduate work in the school may also be applied to the Master of Arts in Interdisciplinary Studies (MAIS) degree or to minors in other advanced degree programs.

Undergraduate Programs

Major

- English (p. 813)

Minors

- Applied Journalism (p. 811)
- English (p. 813)
- Film Studies (p. 815)
- Writing (p. 816)

Certificate

- Scientific, Technical, and Professional Communication (p. 641)

Graduate Programs

Majors

- Creative Writing (p. 812)
- English (p. 812)

Minors

- Creative Writing (p. 812)
- English (p. 813)

Main Office

Moreland Hall
Oregon State University
Corvallis, OR 97331-3502
Website: http://liberalarts.oregonstate.edu/wlf (http://liberalarts.oregonstate.edu/wlf/)

Peter Betjemann, Director
Phone: 541-737-1634
Email: peter.betjemann@oregonstate.edu

Felicia Phillips, Assistant to the Director
Phone: 541-737-1667
Email: felicia.phillips@oregonstate.edu

Steven Kunert, Undergraduate Academic Advisor
Phone: 541-737-1643
Email: skunert@oregonstate.edu

Faculty

Professors Barbour, Davison, Gottlieb, Helle, Lewis, Osagie, Rodgers, Scribner, Tolar Burton, Williams
Associate Professors Betjemann, Holmberg, Jensen, Malewitz, Passarell, Pflugfelder, Olson, Sheehan, Williams
Assistant Professors Bude, Dybek, Ribero, Richter, St. Germain, Ward, Zuo
Senior Instructors Bushnell, Delf, Drummond, Elbom, G., Elbom, E., Harrison, Larison, St. Jacques

Applied Journalism

AJ 199. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 12 credits.

AJ 299. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 6 credits.

AJ 308. WORKSHOP. (1-3 Credits)
This course is repeatable for 6 credits.

AJ 311. MEDIA STORYTELLING. (3 Credits)
Introduction to community journalism, with a focus on developing storytelling methodologies for a variety of media in firsthand reporting praxis.
Prerequisites: WR 121 with B or better
AJ 312. ADVANCED MEDIA STORYTELLING. (3 Credits)
Continued praxis in journalistic storytelling, with an emphasis on developing intensive hard news stories and photojournalistic essay packages through reporting government agencies.
Prerequisites: AJ 311 with B or better

AJ 313. PROFESSIONAL PRACTICES IN APPLIED JOURNALISM. (3 Credits)
Faculty, staff and students connect to generate in-depth critiques of polished journalistic projects, culminating in the production and distribution of a best practices job kit.
Prerequisites: AJ 311 with B or better and AJ 312 [B]
This course is repeatable for 6 credits.

AJ 408. WORKSHOP. (1-3 Credits)
This course is repeatable for 6 credits.

AJ 410. INTERNSHIP. (1 Credit)
Students seeking to obtain the Applied Journalism Minor must complete three sections of AJ 410 Internship, to include reporting, production and/or editorial duties at Orange Media Network (OMN).
This course is repeatable for 6 credits.

AJ 490. MEDIA LAW AND ETHICS. (3 Credits)
Exploring case studies and other analyses germane to the most relevant and pressing legal and ethical issues in contemporary journalism.
Prerequisites: AJ 311 with B or better
This course is repeatable for 6 credits.

English

ENG 104. *INTRODUCTION TO LITERATURE: FICTION. (3 Credits)
Study of fiction for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 104H

ENG 104H. *INTRODUCTION TO LITERATURE: FICTION. (3 Credits)
Study of fiction for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 104

ENG 105. *INTRODUCTION TO LITERATURE: DRAMA. (3 Credits)
Study of drama for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core

ENG 106. *INTRODUCTION TO LITERATURE: POETRY. (3 Credits)
Study of poetry for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 106H

ENG 106H. *INTRODUCTION TO LITERATURE: POETRY. (3 Credits)
Study of poetry for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 106

ENG 107. *INTRODUCTION TO LITERATURE: CREATIVE NONFICTION. (3 Credits)
An introduction to the study of creative nonfiction as a diverse genre, from journalism to memoir and essay. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Recommended: WR 121

ENG 108. *INTRODUCTION TO SCIENCE FICTION AND FANTASY. (3 Credits)
Focuses on modern and contemporary examples of science fiction and fantasy with some attention paid to the roots of the genres (myths, folklore, and fairy tales). Hypothesizes that both genres reflect the anxieties and aspirations of the eras that produce and consume them. Introduces students to a range of modern classics, including contemporary science fiction and fantasy written by women and people of color. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ENG 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 200. LIBRARY SKILLS FOR LITERARY STUDY. (1 Credit)
Introduction to library resources for the study of literature. Required for English majors.

ENG 201. *SHAKESPEARE. (4 Credits)
The earlier plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 201H

ENG 201H. *SHAKESPEARE. (4 Credits)
The earlier plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 201

ENG 202. *SHAKESPEARE. (4 Credits)
The later plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 202H

ENG 202H. *SHAKESPEARE. (4 Credits)
The later plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 202

ENG 204. *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 204H

ENG 204H. *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 204
ENG 205. *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 205H, ENG 205H

ENG 205H. *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 205

ENG 206. *SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 206H

ENG 207. *LITERATURE OF WESTERN CIVILIZATION: CLASSICAL-RENAISSANCE. (4 Credits)
The great plays, poems and fiction of Western civilization. Covers the Classical World: (Greek, Hebrew, Roman) and Western European major authors through the Renaissance. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 208. *LITERATURE OF WESTERN CIVILIZATION: 18TH CENTURY TO PRESENT. (4 Credits)
The great plays, poems and prose of Western civilization from the 18th century Enlightenment through Romanticism and beyond. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 210. *LITERATURES OF THE WORLD: ASIA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Asia. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 211. *LITERATURES OF THE WORLD: AFRICA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ENG 211H

ENG 211H. *LITS OF THE WORLD: AFRICA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ENG 211

ENG 212. *LITERATURES OF THE WORLD: MESO/SOUTH AMERICA, CARIBBEAN. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Meso- and South America and the Caribbean. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 213. *LITERATURES OF THE WORLD: MIDDLE EAST. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of the Middle East. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ENG 213H

ENG 214. *LITERATURE OF THE WORLD: EUROPE. (4 Credits)
Representative works of poetry, prose, and drama written by European authors. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ENG 215. *CLASSICAL MYTHOLOGY. (4 Credits)
Greek and Roman mythology, its allusions, continuing influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 220. *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
A comparative treatment of literary topics in the context of institutional and systematic discrimination. Not offered every year. CROSSTLISTED as ENG 220/FILM 220. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 220H, FILM 220

ENG 220H. *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
A comparative treatment of literary topics in the context of institutional and systematic discrimination. Not offered every year. CROSSTLISTED as ENG 220/FILM 220. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 220, FILM 220

ENG 221. *AFRICAN-AMERICAN LITERATURE. (4 Credits)
Reading and critical analysis of African-American literature in historical, political, and/or thematic perspective. Content changes from term to term. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 221H

This course is repeatable for 8 credits.
ENG 221H. *AFRICAN-AMERICAN LITERATURE. (4 Credits)
Reading and critical analysis of African-American literature in historical, political, and/or thematic perspective. Content changes from term to term. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 221
This course is repeatable for 8 credits.

ENG 222. CHILDREN'S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales, and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.

ENG 225. THE ART, SCIENCE, AND LITERATURE OF FLY FISHING. (1 Credit)
Designed to rapidly introduce students to some of the major themes and formal devices of literature written about fly fishing. In four days, we will gain a sense of how four different genres—the short story, the novel, poetry, and creative nonfiction—represent and understand this activity.
Corequisites: FW 112, PAC 331

ENG 230X. HUMANS AND THE OCEAN. (3 Credits)
An introduction to marine science and the history of humans' interaction with the ocean. Lectures, group and individual library research, fieldtrips, and assignments will collate approaches from marine science, history, literary study, and other scientific and humanistic disciplines to introduce course material. Topics include oceanographic exploration, fishing and overfishing, and marine pollution. CROSSLISTED as ENG 230X/FW 230X/TOX 230X.
Equivalent to: FW 230X, TOX 230X

ENG 240. *INTRODUCTION TO ENVIRONMENTAL LITERATURE. (4 Credits)
An exploration of the key figures, themes, theories, and works of American environmental literature. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ENG 253. *SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900. (4 Credits)
Readings from American literature presented in chronological sequence, important eras and movements with emphasis on major writers. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 254. *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT. (4 Credits)
Readings from American literature presented in chronological sequence, important eras and movements with emphasis on major writers. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 254H

ENG 254H. *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT. (4 Credits)
Readings from American literature presented in chronological sequence, important eras and movements with emphasis on major writers. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 254

ENG 260. *LITERATURE OF AMERICAN MINORITIES. (4 Credits)
Study of the literature of American minorities: North American Indian, black, Chicano/Chicana, Asian, Middle Eastern, gay and lesbian. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 260H

ENG 260H. *LITERATURE OF AMERICAN MINORITIES. (4 Credits)
Study of the literature of American minorities: North American Indian, black, Chicano/Chicana, Asian, Middle Eastern, gay and lesbian. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 260

ENG 275. *THE BIBLE AS LITERATURE. (4 Credits)
Biblical structure, literary types, ideas, influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 275H

ENG 275H. *THE BIBLE AS LITERATURE. (4 Credits)
Biblical structure, literary types, ideas, influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 275

ENG 295. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENG 295H, PHL 295, PHL 295H, WGSS 295, WGSS 295H

ENG 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, PHL 295, PHL 295H, WGSS 295, WGSS 295H

ENG 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 301 with D- or better

ENG 304. CAREER PREPARATION FOR ENGLISH MAJORS. (2 Credits)
Introduces students majoring in English to tasks and processes needed to successfully prepare for a future career. Includes exercises in self-reflection, guidance in exploring professional options and networking, and feedback on job-seeking materials.
Prerequisites: ENG 301 with D- or better

ENG 311. *STUDIES IN BRITISH PROSE. (4 Credits)
An introduction to the prose genre in British literature with intensive practice in reading and writing practices for literary study. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
ENG 317. *THE AMERICAN NOVEL: BEGINNINGS TO CHOPIN. (4 Credits)
Chronological survey of the novel in America. Covers from the beginnings to Chopin. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 318. *THE AMERICAN NOVEL: MODERNIST PERIOD. (4 Credits)
Chronological survey of the novel in America. Covers Modernist Period from Dreiser to Faulkner. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 319. *THE AMERICAN NOVEL: POST-WORLD WAR II. (4 Credits)
Chronological survey of the novel in America. Covers Post-World War II: Mailer to the present. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 320. *STUDIES IN PAGE, STAGE, AND SCREEN. (4 Credits)
Study of a particular theme, genre, movement, or author through the relations of text and performance. Topics change from term to term and may include content from film, drama, digital sources, and other visual media. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core

ENG 321. *STUDIES IN WORD, OBJECT, AND IMAGE. (4 Credits)
Study of a particular theme, genre, movement, or author through the relations of texts to material artifacts and/or static visual objects (e.g., paintings, engravings, printed matter, or photographs). Topics change from term to term. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
This course is repeatable for 8 credits.

ENG 322. *STUDIES IN GLOBALISM, TEXT, AND EVENT. (4 Credits)
Study of a particular theme, genre, movement, or author informed by patterns of globalization, issues in international relations, and/or landmark moments of cultural exchange. Topics change from term to term. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CSGI – Core, Synth, Global Issues
This course is repeatable for 8 credits.

ENG 330. *THE HOLOCAUST IN LITERATURE AND FILM. (4 Credits)
Study of fiction, memoir, and film representing Nazi Holocaust of European Jewry. Reviews history of racial Anti-Semitism and rise of Nazism as context for textual analysis of Holocaust literature. Examines literary and filmic form as productive to social awareness of the roots, events, and aftermath of the Holocaust. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ENG 345. INTRODUCTION TO LITERARY CRITICISM AND THEORY. (4 Credits)
Study and analysis of critical frameworks and methodologies for the interpretation of literature and culture. Required for English majors. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: ENG 200 with C- or better

ENG 360. *NATIVE AMERICAN LITERATURE. (4 Credits)
An introduction to the prose and poetry written by Native Americans of the North American continent. Not offered every year. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 362. *AMERICAN WOMEN WRITERS. (4 Credits)
Study of important literary works of any genre by American women from historical, thematic, or formalist perspectives. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 362H

ENG 374. *MODERN SHORT STORY. (4 Credits)
Survey of the short story from the 19th century to the present. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 374H

ENG 375H. CHILDREN'S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales, and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.
Equivalent to: ENG 375H

ENG 375. CHILDREN'S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENG 375

ENG 386. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART I. (4 Credits)
The first course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Conquest to Civil War. CROSSLISTED as ART 386/ENG 386.
Equivalent to: ART 386

ENG 387. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART II. (4 Credits)
The second course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Civil War to Harlem Renaissance. CROSSLISTED as ART 387/ENG 387.
Equivalent to: ART 387

ENG 388. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART III. (4 Credits)
The third course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Great Depression to Postmodernity. CROSSLISTED as ART 388/ENG 388.
Equivalent to: ART 388

ENG 399. SELECTED TOPICS. (1-16 Credits)
(H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: ENG 399H
This course is repeatable for 16 credits.
ENG 399H. SELECTED TOPICS. (1-16 Credits)

Equivalents:  ENG 399
This course is repeatable for 16 credits.

ENG 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 406. PROJECTS. (1-16 Credits)
Equivalent to: ENG 406H
This course is repeatable for 16 credits.

ENG 407. *SEMINAR. (1-16 Credits)
CROSSLISTED as AMS 407/ENG 407. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ENG 407H
This course is repeatable for 16 credits.

ENG 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 410. INTERNSHIP IN ENGLISH. (1-16 Credits)
Provides upper-division English majors with supervised, on-the-job work experience, accompanying academic readings. Graded P/N.
This course is repeatable for 16 credits.
Recommended: 16 credits of literature; 6 credits of writing beyond WR 121

ENG 412. STUDIES IN BRITISH THEATER AND SOCIETY. (4 Credits)
Study of major dramatists and the audiences they addressed, of socio-economic conditions and their interrelations with theatrical institutions. Readings may include dramatic and non-dramatic literature. Historical period and content may vary. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 416. *POWER AND REPRESENTATION. (4 Credits)
Critical analysis of works by colonized peoples, women, and ethnic minorities, with a focus on the issue of representation. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 418. THE ENGLISH NOVEL: VICTORIAN PERIOD. (4 Credits)
Selected English novels focusing on those from the Victorian period. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 420. *STUDIES IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
Comparative studies in literature documenting or illuminating institutional and systematic discrimination. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 425. STUDIES IN MEDIEVAL LITERATURE. (4 Credits)
Particular genres, themes, and writers in medieval literature. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 426. STUDIES IN CHAUCER. (4 Credits)
The works of Geoffrey Chaucer in their historical, cultural, and poetic contexts. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 430. STUDIES IN EARLY MODERN LITERATURE. (4 Credits)
Literature and culture of the Tudor, early Stuart, and Interregnum periods, 1485-1660. Content and genres will vary and may include non-English writers who influenced the English Renaissance. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 433. STUDIES IN THE LONG EIGHTEENTH CENTURY. (4 Credits)
Literature of the period 1660-1800, with emphasis on one or more of the following authors: Dryden, Pope, Swift, Johnson, Gray, Cowper. May also include prose writers (e.g., Behn, Fielding, Richardson, Addison and Steele) and dramatists (e.g., Congrieve, Wycherly, Gay). Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 434. STUDIES IN ROMANTICISM. (4 Credits)
Romantic-period writing and culture, with emphasis on one or more of the following authors: Blake, Wordsworth, Coleridge, Keats, Byron and Shelley. May also include Romantic novelists and prose writers (e.g., Austen, Wollstonecraft, Burke). Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 435. STUDIES IN SHAKESPEARE. (4 Credits)
Shakespeare’s works from a variety of critical and scholarly perspectives. Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.
ENG 436. STUDIES IN VICTORIAN LITERATURE. (4 Credits)
Fiction, poetry, and nonfiction prose of the Victorian era. Topics change from term to term. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 438. STUDIES IN MODERNISM. (4 Credits)
Studies in the literature and contexts of the Modernist period in Anglo-American letters (1890s to 1940s). Authors may include Wilde, Crane, Conrad, Eliot, Stevens, James, Woolf, Joyce, Lawrence, Shaw, Forster. Topics change from term to term. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 440. STUDIES IN MODERN IRISH LITERATURE. (4 Credits)
Studies in the literature and contexts of the period of Irish writing often referred to as the Irish Renaissance. Authors may include Yeats, Joyce, Shaw, O’Casey, Gregory, Synge, Bowen, Moore, Behan, O’Brien, Kavanagh, Cronin. Sometimes offered as a study of Joyce’s works alone. Topics change from term to term. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 445. STUDIES IN NONFICTION. (4 Credits)
Particular essayists and journalists, movements, problems, conventions, and types of nonfiction writing in English. Topics change from term to term. Not offered every year. (H) (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 450. STUDIES IN SHORT FICTION. (4 Credits)
Particular writers, movements, and types of short fiction. Topics change from term to term. Not offered every year. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 454. MAJOR AUTHORS. (4 Credits)
Advanced study of major and influential authors from various cultures and backgrounds. Subjects change from term to term. Not offered every year. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 460. STUDIES IN DRAMA. (4 Credits)
Particular dramatists, movements, conventions, and types of world drama. Topics change from term to term. Not offered every term. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 465. STUDIES IN THE NOVEL. (4 Credits)
Particular novelists, movements, conventions, and types of the novel throughout its history. Topics change from term to term. Not offered every term. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 470. STUDIES IN POETRY. (4 Credits)
Particular poets, movements, problems, conventions, and types of poetry in English or English translation. Topics change from term to term. Not offered every term. (H) (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 475. STUDIES IN CRITICISM. (4 Credits)
Particular critics, critical movements, issues, and histories of criticism. Topics change from term to term. Not offered every year. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 16 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 480. STUDIES IN LITERATURE, CULTURE AND SOCIETY. (4 Credits)
Study of literature in its relationship to society and culture; study of literary culture. Topics change from term to term. Not offered every term. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
Equivalent to: FILM 480
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 482. STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT. (4 Credits)
Creative nonfiction, fiction, poetry, and film from the mid-19th century to the present, examining relationships between rural and urban, and investigating the development of important patterns in how the physical environment is perceived, represented, interpreted, and used in the United States. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 485. STUDIES IN AMERICAN LITERATURE. (4 Credits)
Special topics in American literary history. Organized around movements, regions, themes, or major authors. Topics change from term to term. Not offered every term. (H) (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.

ENG 486. STUDIES IN BRITISH LITERATURE. (4 Credits)
Particular British writers, movements, conventions, genres, and problems. Topics change from term to term. Not offered every year. (H)
**Attributes:** LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above.
ENG 488. LITERATURE AND PEDAGOGY. (4 Credits)
Practices, approaches, histories, and theories of teaching literature appropriate for secondary through college settings. Considers text selection, assignments, and evaluation. (H)
Attributes: LACH – Liberal Arts Humanities Core

ENG 489. WRITING, LITERATURE AND MEDICINE. (4 Credits)
Considers medical themes in literature, social meanings of illness, and writing strategies appropriate to the healing arts.

ENG 490. HISTORY OF THE ENGLISH LANGUAGE. (4 Credits)
A study of the origins, changes, and reasons for changes in the grammar, sounds, and vocabulary of English from its earliest stages through its modern forms. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 497. *INTERNATIONAL WOMEN’S VOICES. (4 Credits)
A study of women and literature in an international context, focusing on the cultural differences among women and the effects of gender on language and literature. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 498. WOMEN AND LITERATURE. (4 Credits)
Study of the relations between women and literature, including such issues as images of women in literature, women writers, and the effects of gender on language. This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 499. SELECTED TOPICS. (1-16 Credits)
(H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 16 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENG 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 507. SEMINAR. (1-16 Credits)
CROSSLISTED as AMS 507/ENG 507.
Equivalent to: AMS 507
This course is repeatable for 16 credits.

ENG 510. GRADUATE INTERNSHIP IN ENGLISH. (1-2 Credits)
Provides graduate students with supervised, on-the-job work experience and professional development. Graded P/N.
This course is repeatable for 12 credits.

ENG 512. STUDIES IN BRITISH THEATER AND SOCIETY. (4 Credits)
Study of major dramatists and the audiences they addressed, of socio-economic conditions and their interrelations with theatrical institutions. Readings may include dramatic and non-dramatic literature. Historical period and content may vary.
This course is repeatable for 8 credits.

ENG 514. INTRODUCTION TO GRADUATE STUDIES. (4 Credits)
Introduction to the MA program; theories and methods of English studies. Offered fall term only. Required for first-year MA students.

ENG 516. POWER AND REPRESENTATION. (4 Credits)
Critical analysis of works by colonized peoples, women, and ethnic minorities, with a focus on the issue of representation. Not offered every year.

ENG 518. THE ENGLISH NOVEL: VICTORIAN PERIOD. (4 Credits)
Selected English novels focusing on those from the Victorian period.

ENG 519. THE ENGLISH NOVEL: 20TH CENTURY. (4 Credits)
Selected English novels of the 20th century.

ENG 520. STUDIES IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
Comparative studies in literature documenting or illuminating institutional and systematic discrimination. Not offered every year.

ENG 525. STUDIES IN MEDIEVAL LITERATURE. (4 Credits)
Particular genres, themes, and writers in medieval literature. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 526. STUDIES IN CHAUCER. (4 Credits)
The works of Geoffrey Chaucer in their historical, cultural, and poetic contexts. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 530. STUDIES IN EARLY MODERN LITERATURE. (4 Credits)
Literature and culture of the Tudor, early Stuart, and Interregnum periods, 1485-1660. Content and genres will vary and may include non-English writers who influenced the English Renaissance.
This course is repeatable for 8 credits.

ENG 533. STUDIES IN THE LONG EIGHTEENTH CENTURY. (4 Credits)
Literature of the period 1660-1800, with emphasis on one or more of the following poets: Dryden, Pope, Swift, Johnson, Gray, Cowper. May also include prose writers (e.g., Behn, Fielding, Richardson, Addison and Steele) and dramatists (e.g., Congreve, Wycherly, Gay). Not offered every term.
This course is repeatable for 8 credits.

ENG 534. STUDIES IN ROMANTICISM. (4 Credits)
Romantic-period writing and culture, with emphasis on one or more of the following authors: Blake, Wordsworth, Coleridge, Keats, Byron and Shelley. May also include Romantic novelists and prose writers (e.g., Austen, Wollstonecraft, Burke). Not offered every term.
This course is repeatable for 8 credits.

ENG 535. STUDIES IN SHAKESPEARE. (4 Credits)
Shakespeare’s works from a variety of critical and scholarly perspectives. Not offered every term.
This course is repeatable for 8 credits.

ENG 536. STUDIES IN VICTORIAN LITERATURE. (4 Credits)
Fiction, poetry, and nonfiction prose of the Victorian era. Topics change from term to term.
This course is repeatable for 8 credits.
ENG 538. STUDIES IN MODERNISM. (4 Credits)
Studies in the literature and contexts of the Modernist period in Anglo-American letters (1890’s to 1940’s). Authors may include Wilde, Crane, Conrad, Eliot, Stevens, James, Woolf, Joyce, Lawrence, Shaw, Forster. Topics change from term to term. This course is repeatable for 8 credits.

ENG 540. STUDIES IN MODERN IRISH LITERATURE. (4 Credits)
Studies in the literature and context of the period of Irish writing often referred to as the Irish Renaissance. Authors may include Yeats, Joyce, Shaw, O’Casey, Gregory, Synge, Bowen, Moore, Behan, O’Brien, Kavanagh, Cronin. Sometimes offered as a study of Joyce’s works alone. Topics change from term to term. This course is repeatable for 8 credits.

ENG 545. STUDIES IN NONFICTION. (4 Credits)
Particular essayists and journalists, movements, problems, conventions, and types of nonfiction writing in English. Topics change from term to term. This course is repeatable for 16 credits.

ENG 550. STUDIES IN SHORT FICTION. (4 Credits)
Particular writers, movements, and types of short fiction. Topics change from term to term. Not offered every year. This course is repeatable for 8 credits.

ENG 554. MAJOR AUTHORS. (4 Credits)
Advanced study of major and influential authors from various cultures and backgrounds. Subjects change from term to term. Not offered every year. This course is repeatable for 8 credits.

ENG 560. STUDIES IN DRAMA. (4 Credits)
Particular dramatists, movements, conventions, and types of world drama. Topics change from term to term. Not offered every term. This course is repeatable for 8 credits.

ENG 565. STUDIES IN THE NOVEL. (4 Credits)
Particular novelists, movements, conventions, and types of the novel throughout its history. Topics change from term to term. Not offered every term. This course is repeatable for 8 credits.

ENG 570. STUDIES IN POETRY. (4 Credits)
Particular poets, movements, problems, conventions, and types of poetry in English or English translation. Topics change from term to term. Not offered every term. This course is repeatable for 8 credits.

ENG 575. STUDIES IN CRITICISM. (4 Credits)
Particular critics, critical movements, issues, and histories of criticism. Topics change from term to term. Not offered every year. This course is repeatable for 16 credits.

ENG 580. STUDIES IN LITERATURE, CULTURE AND SOCIETY. (4 Credits)
Study of literature in its relationship to society and culture; study of literary culture. Topics change from term to term. Not offered every term. Equivalent to: FILM 580 This course is repeatable for 16 credits.

ENG 582. STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT. (4 Credits)
Creative nonfiction, fiction, poetry, and film from the mid-19th century to the present, examining relationships between rural and urban, and investigating the development of important patterns in how the physical environment is perceived, represented, interpreted, and used in the United States. This course is repeatable for 8 credits.

ENG 585. STUDIES IN AMERICAN LITERATURE. (4 Credits)
Special topics in American literary history. Organized around movements, regions, themes, or major authors. Topics change from term to term. Not offered every term. This course is repeatable for 8 credits.

ENG 586. STUDIES IN BRITISH LITERATURE. (4 Credits)
Particular British writers, movements, conventions, genres, and problems. Topics change from term to term. Not offered every year. This course is repeatable for 8 credits.

ENG 588. LITERATURE AND PEDAGOGY. (4 Credits)
Practices, approaches, histories, and theories of teaching literature appropriate for secondary through college settings. Considers text selection, assignments, and evaluation.

ENG 589. WRITING, LITERATURE AND MEDICINE. (4 Credits)
Considers medical themes in literature, social meanings of illness, and writing strategies appropriate to the healing arts.

ENG 590. HISTORY OF THE ENGLISH LANGUAGE. (4 Credits)
A study of the origins, changes, and reasons for changes in the grammar, sounds, and vocabulary of English from its earliest stages through its modern forms.

ENG 595. LANGUAGE, TECHNOLOGY, AND CULTURE. (4 Credits)
Explores relationship between literacy, technology, and thought.

ENG 598. WOMEN AND LITERATURE. (4 Credits)
Study of the relations between women and literature, including such issues as images of women in literature, women writers, and the effects of gender on language. This course is repeatable for 8 credits.

Film Studies

FILM 110. *INTRODUCTION TO FILM STUDIES: 1895-1945. (3 Credits)
An introduction to the serious study of world cinema, 1895-1945. Class lectures will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films from the U.S., Europe, and Asia accompany the lectures. Film fee required. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core Equivalent to: ENG 110

FILM 125. *INTRODUCTION TO FILM STUDIES: 1945-PRESENT. (3 Credits)
Provides an introduction to the serious study of world cinema, 1945-present. Class lectures will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films from the U.S., Europe, and Asia accompany the lectures. Film fee required. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core Equivalent to: ENG 125

FILM 220. *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
A comparative treatment of literary topics in the context of institutional and systematic discrimination. Not offered every year. CROSSLISTED as ENG 220/FILM 220. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core Equivalent to: ENG 220, ENG 220H
FILM 245. *THE NEW AMERICAN CINEMA. (4 Credits)
A formalist, ideological, and commercial investigation into contemporary American cinema. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 245, FILM 245H

FILM 245H. *THE NEW AMERICAN CINEMA. (4 Credits)
A formalist, ideological, and commercial investigation into contemporary American cinema. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 245, ENG 245H, FILM 245

FILM 255. *WORLD CINEMA PART I: ORIGINS TO 1968. (4 Credits)
A systematic introduction to the arts and history of international cinema, from the invention of the medium in 1895 to the rise of New Wave and Third Cinema in the 1960s. Weekly screenings of films such as Rashomon, Tokyo Story, Pather Parchali, Terra em Transe, and La Noire de. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

FILM 256. *WORLD CINEMA PART II: 1968-PRESENT. (4 Credits)
A systematic introduction to the arts and history of international cinema, from the decolonization movement in the 1960s and the 1970s to the dynamics of globalization that we are experiencing today. Weekly screenings include such films as A Better Tomorrow, Chungking Express, Spirited Away, Oldboy, Bombay, and City of God. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

FILM 265. *FILMS FOR THE FUTURE. (4 Credits)
An interdisciplinary study of film, literary, and philosophical visions of the future. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 265

FILM 310. *FILM THEORY AND CRITICISM. (4 Credits)
Survey of significant works and movements in film theory and criticism, from classical to contemporary eras. Begins with the question of what distinguishes film from other visual arts, pursuing questions about the ontology of film, medium specificity, and aesthetics. Proceeds with investigations concerning issues of technology, authorship, genre, the avant-garde, gender, race and ethnicity, commercialism, transnationalism, queer theory, and affect. Weekly screenings will supplement class readings, lectures and discussions. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Prerequisites: FILM 110 with C or better or FILM 125 with C or better

FILM 360. INTERNATIONAL FILM FESTIVAL. (3 Credits)
Critical study of a selection of films screened at the Oregon State University’s International Film Festival. Topics include acting, sound, special effects, cinematography. CROSSLISTED as FILM 360/WLC 360.
Equivalent to: WLC 360
This course is repeatable for 9 credits.

FILM 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: FILM 399H
This course is repeatable for 16 credits.
WR 115. INTRODUCTION TO EXPOSITORY WRITING. (3 Credits)
Introduction to rhetorical concepts and writing strategies necessary for university level written composition. Includes substantial discussion of grammar, punctuation, and usage conventions of standard written English. Does not satisfy WR 121 requirement. Graded P/N. This course is repeatable for 6 credits.

WR 121. *ENGLISH COMPOSITION. (3 Credits)
Introduction to critical thinking, the writing process, and the forms of expository writing. Intensive writing practice, with an emphasis on revision. The term in which the student takes the course is determined alphabetically. (Bacc Core Course)
Attributes: CSW1 – Core, Skills, WR I
Equivalent to: WR 121H

WR 121H. *ENGLISH COMPOSITION. (3 Credits)
Introduction to critical thinking, the writing process, and the forms of expository writing. Intensive writing practice, with an emphasis on revision. The term in which the student takes the course is determined alphabetically. (Bacc Core Course)
Attributes: CSW1 – Core, Skills, WR I; HNRS – Honors Course Designator
Equivalent to: WR 121

WR 130. FUNDAMENTALS OF GRAMMAR, SYNTAX, AND SENTENCE BUILDING. (1 Credit)
Provides opportunities to improve writing at the sentence level. Focuses on the fundamental elements of the sentence (grammar), the principles and rules of sentence structure (syntax), and techniques for writing meaningful, compelling sentences (sentence building). WR 130 is a hybrid course; students will use online modules, activities, and quizzes to advance understanding of grammar fundamentals and to practice writing, editing, and revising sentences. In-person meetings will emphasize student questions and applying lessons to other academic writing projects. Graded P/N.

WR 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

WR 201. *WRITING FOR MEDIA. (3 Credits)
Introduction to newspaper style. Introduction to reporting. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Equivalent to: LS 201
Recommended: Grade B or higher in WR 121 or WR 121H and 30 wpm typing speed.

WR 214. *WRITING IN BUSINESS. (3 Credits)
Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in business and industry. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 222. *ENGLISH COMPOSITION. (3 Credits)
Continued practice in expository writing with an emphasis on argumentation and research. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 224. *INTRODUCTION TO FICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 224H. *INTRODUCTION TO FICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 228. *WRITING ABROAD. (3 Credits)
Prepares students to compose thoughtful, nuanced, and journalistically-grounded writing for a Web-based audience based on experiences studying abroad. By reading deeply in the lifestyle and creative nonfiction genres, students will develop strategies for communicating their observations effectively. Instruction follows an editorial model, allowing students to practice the role of editor, freelancer, and designer, all with an eye towards publishing in a course-affiliated online magazine. To achieve success in this course, students must demonstrate knowledge of writing techniques appropriate to the genre and must demonstrate editorial skill. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better

WR 230. *ESSENTIALS OF ENGLISH GRAMMAR. (3 Credits)
Introduces students to the structure of sentences with a focus on beginning grammar. Students in WR 230 will learn the differences between clauses and phrases, how to recognize subjects and predicates in a variety of sentence types, how to avoid the most common grammatical errors in student writing, and how to use punctuation correctly—often with intention. Students will complete readings, watch videos, participate in discussions, and demonstrate understanding through weekly quizzes. They will also challenge themselves with numerous writing activities, and complete writing analysis projects. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
WR 239. *INTRODUCTION TO WRITING FICTION AND CREATIVE NONFICTION. (3 Credits)
Explores how to write good stories, whether real or imagined. Students will read and write in both genres, identifying the elements that make stories more vivid, more human, and more true. Students will write informal pieces and one longer work in each genre, and will workshop one story or essay. Taught via Ecampus only.

WR 240. *INTRODUCTION TO NONFICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
This course is repeatable for 8 credits.

WR 241. *INTRODUCTION TO POETRY WRITING. (3 Credits)
Discussion workshop. Rudiments of mechanics and some background in development of modern poetry. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 250. *PODCAST STORYTELLING. (3 Credits)
Focuses on the skills needed to write, record, and produce informative and engaging podcasts. Students develop themes, write scripts, conduct interviews, and learn to make thoughtful editing decisions in the production of audio podcasts.
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better

WR 301. *PUBLISHING AND EDITING. (3 Credits)
Invites students to learn about editing and copyediting techniques, broader editorial decisions, and current publishing platforms. Students will learn about scholarly publishing in the U.S. and about how social media and public relations fit into this world. Participants will also explore editing within a rhetorical dimension, considering purpose and audience, as well as conventions of grammar, mechanics, and usage. Students will review a scholarly article reporting on research in editing and/or publishing, as well as develop a publication-ready work of their own. As part of a final project, the class will work toward a collaborative publication. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with D- or better

WR 303. *WRITING FOR THE WEB. (3 Credits)
Concerns the production of instructive, informative, and rhetorically savvy writing for Web-based locations and applications. Helps people find information, get things done, convey their opinions, build communities, and collaborate on complex projects. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with D- or better or WR 121H with D- or better

WR 323. *ENGLISH COMPOSITION. (3 Credits)
Continued practice in writing with an emphasis on the elements of style: diction, tone, precision and economy, emphasis, figurative language. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 324. *SHORT STORY WRITING. (4 Credits)
Study and writing of the short story. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 224 with D- or better
This course is repeatable for 8 credits.

WR 327. *TECHNICAL WRITING. (3 Credits)
Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in scientific and technological fields.
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
Equivalent to: WR 327H

WR 330. *UNDERSTANDING GRAMMAR. (3 Credits)
Advanced study of traditional grammatical forms and conventional grammatical terms with emphasis on the assumptions underlying the structure of traditional grammar.
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better

WR 331. *POETRY WRITING. (4 Credits)
Study and writing of verse. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 241 with D- or better
This course is repeatable for 8 credits.

WR 332. *WRITING ABOUT PLACES. (3 Credits)
Utilizing personal experience, reading, and research, students discuss, and practice the conventions of writing about place far and near, global and local, for various audiences and in a range of formats.
Prerequisites: WR 121 with D- or better

WR 362. *SCIENCE WRITING. (3 Credits)
Students learn and practice the conventions for writing scientific material for a variety of audiences. Involves writing and research assignments, multimedia presentations, lecture, and in-class and online activities.
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
Equivalent to: WR 362H
WR 362H. *SCIENCE WRITING. (3 Credits)
Students learn and practice the conventions for writing scientific material for a variety of audiences. Involves writing and research assignments, multimedia presentations, lecture, and in-class and online activities. (Bacc Core Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
Equivalent to: WR 362

WR 383. FOOD WRITING. (4 Credits)
Students will write about food and food issues for a variety of audiences, including print and digital, adapting their texts to become increasingly sophisticated critical thinkers and writers who can shape material effectively. Will also address food science and food studies from a historical and cultural background.
Prerequisites: (WR 121 with D- or better or WR 121H with D- or better) and (HC 199 [D-] or PHIL 121 [D-] or WR 201 [D-] or WR 214 [D-] or WR 222 [D-] or WR 224 [D-] or WR 241 [D-] or WR 323 [D-] or WR 324 [D-] or WR 327 [D-] or WR 330 [D-] or WR 341 [D-] or WR 362 [D-])

WR 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: WR 399H
This course is repeatable for 16 credits.

WR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: WR 399
This course is repeatable for 16 credits.

WR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WR 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

WR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

WR 404. WRITING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WR 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WR 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WR 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WR 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WR 411. *THE TEACHING OF WRITING. (4 Credits)
Pedagogy and theory in composition; prepares teachers (secondary through college) in writing process, assignment design, evaluation, and grammar. Also focuses on students' own writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

WR 414. ADVERTISING AND PUBLIC RELATIONS WRITING. (4 Credits)
Writing news releases, annual reports, brochures, newsletters, and other PR materials. Writing advertising copy.
Prerequisites: WR 121 with B or better or WR 121H with B or better

WR 416. ADVANCED COMPOSITION. (4 Credits)
The development of style and voice in both the personal and the academic essay.
Equivalent to: WR 416H
This course is repeatable for 8 credits.

WR 420. STUDIES IN WRITING. (4 Credits)
Selected topics in rhetoric and composition.
This course is repeatable for 8 credits.

WR 424. ADVANCED FICTION WRITING. (4 Credits)
Workshop. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 324 with D- or better
This course is repeatable for 8 credits.

WR 435. SCIENTIFIC, TECHNICAL, & PROFESSIONAL COMMUNICATION CAPSTONE. (1 Credit)
Complete a portfolio comprised of material generated throughout previous courses in the Certificate in Scientific, Technical, and Professional Communication. CROSSLISTED as COMM 435/WR 435.
Equivalent to: COMM 435
Recommended: Completion of 18 credits towards the Scientific, Technical, and Professional Communication Certificate

WR 440. ADVANCED CREATIVE NONFICTION WRITING. (4-8 Credits)
An advanced course in creative nonfiction writing, centered around workshops of polished material.
Prerequisites: WR 340 with D- or better
This course is repeatable for 8 credits.

WR 441. ADVANCED POETRY WRITING. (4 Credits)
Advanced poetry workshop. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 341 with D- or better
This course is repeatable for 8 credits.

WR 448. MAGAZINE ARTICLE WRITING. (4 Credits)
Writing the magazine article. Analyzing markets and writing query and cover letters, marketing manuscripts to magazines. Interviewing and researching.

WR 449. CRITICAL REVIEWING. (4 Credits)
Writing critical reviews of books, television programs, movies, plays, and restaurants for newspapers and magazines. The role of criticism in popular culture.

WR 462. *ENVIRONMENTAL WRITING. (4 Credits)
Writing about environmental topics from multiple perspectives. Includes science journalism, research and writing on current scientific issues and controversies, and theories of rhetoric and environmentalism. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

WR 466. PROFESSIONAL WRITING. (4 Credits)
Introduces the texts, contexts, and concepts important to the practice of professional communication in organizational contexts, addressing practical writing skills, rhetoric, ethics, and information design. Course readings concern what professional writers do and what theories govern their actions, bridging the gap between real-world problems and academic research.
Prerequisites: WR 121 with D- or better or WR 121H with D- or better
WR 475. RHETORICS OF RACE. (4 Credits)
By exploring the interrelated concepts of race, racialization, and racism, Rhetorics of Race problematizes race as a taken-for-granted phenomenon. Through reading, writing, and discussion, class participants study racial formations as historically specific and analyze contemporary forms of racism in the US. Readings and discussion pay close attention to how rhetoric and discourse have the power to reproduce and challenge white supremacy and race-based oppressions. Emphasizing the intersectionality of oppression—that racism necessarily takes place at intersections with other forms of subordination including sexism, homophobia, ableism, etc.—Rhetorics of Race draws from Queer Black Feminism, Chicano@ Feminism, and Critical Race Theory.

WR 485. CONTEMPORARY RHETORIC THEORY. (4 Credits)
Familiarizes students with a range of theories that have significantly contributed to or influenced the field of modern and contemporary rhetorical research. The course examines scholars, concepts, and methodologies that are central to contemporary rhetorical theory, while touching on key critical theorists who, although may be considered outside the field of rhetoric studies, impact the ways in which language, persuasion, and communication are currently understood. From this work, students develop their own perspectives and generate evidence-based arguments concerning those same issues.

Prerequisites: WR 121 with C- or better or WR 121H with C- or better
WR 493. THE RHETORICAL TRADITION AND THE TEACHING OF WRITING. (4 Credits)
Major past and contemporary theories of written communication, their historical context, and their impact on writing and the teaching of writing. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

WR 495. INTRODUCTION TO LITERACY STUDIES. (4 Credits)
Literacy studies in multidisciplinary contexts. Examines historical, theoretical, and practical relationships among reading, writing, language, culture, and schooling. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

WR 497. DIGITAL LITERACY AND CULTURE. (4 Credits)
From pencils to pixels, telegraphs to texts, and semaphores to social networking, Digital Literacy and Culture focuses on the relationships between human expression and the technologies that provide context, culture, and schooling. (Writing Intensive Course)

Prerequisites: WR 121 with C- or better or WR 121H with C- or better
WR 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

WR 500. MFA RESIDENCY. (1-20 Credits)
Low-Residency Masters of Fine Arts Residency. Required course for graduate students in the Low-Residency Masters of Fine Arts in Creative Writing.

This course is repeatable for 48 credits.

WR 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WR 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

WR 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WR 504. WRITING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WR 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WR 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WR 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WR 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WR 509. PRACTICUM. (1-16 Credits)
Required practicum for graduate students teaching introduction to poetry writing.

This course is repeatable for 16 credits.

WR 511. THE TEACHING OF WRITING. (4 Credits)
Pedagogy and theory in composition; prepares teachers (secondary through college) in writing process, assignment design, evaluation, and grammar. Also focuses on student’s own writing.

WR 512. CURRENT COMPOSITION THEORY. (4 Credits)
Current rhetoric and composition theory and its applications for teachers and writers.

WR 513. LOW-RESIDENCY MFA MENTORSHIP. (5-12 Credits)
Low-Residency Masters of Fine Arts Mentorship. Required course for graduate students in the Low-Residency Masters of Fine Arts in Creative Writing.

This course is repeatable for 36 credits.

WR 514. ADVERTISING AND PUBLIC RELATIONS WRITING. (4 Credits)
Writing news releases, annual reports, brochures, newsletters, and other PR materials. Writing advertising copy.

WR 516. ADVANCED COMPOSITION. (4 Credits)
The development of style and voice in both the personal and the academic essay.

This course is repeatable for 16 credits.

WR 517. TEACHING PRACTICUM: ENGLISH COMPOSITION. (2 Credits)
Required practicum for graduate students teaching English Composition.

WR 518. TEACHING PRACTICUM: WRITING IN BUSINESS. (1 Credit)
Pedagogy practicum for graduate students in the teaching of professional writing and communication. This course is required for GTA’s who will teach WR 214, Writing in Business.

This course is repeatable for 3 credits.

WR 519. TEACHING PRACTICUM: WR 222. (1 Credit)
This practicum prepares graduate teaching assistants to teach Writing 222 (Argumentation). It includes both theoretical and practical components, providing an overview of the curriculum and addressing course development, lesson planning, and pedagogical best practices. The practicum is required for SWLF graduate students with a focus in rhetoric and composition.

WR 520. STUDIES IN WRITING. (4 Credits)
Selected topics in rhetoric and composition.

This course is repeatable for 8 credits.

WR 521. TEACHING PRACTICUM: FICTION WRITING. (1 Credit)
Required practicum for graduate students teaching introduction to fiction writing.

This course is repeatable for 3 credits.

WR 522. TEACHING PRACTICUM: POETRY WRITING. (1 Credit)
Required practicum for graduate students teaching introduction to poetry writing.

This course is repeatable for 3 credits.
WR 523. TEACHING PRACTICUM: NONFICTION WRITING. (1 Credit)
Required practicum for graduate students teaching introduction to nonfiction writing.
This course is repeatable for 3 credits.

WR 524. ADVANCED FICTION WRITING. (4 Credits)
Advanced fiction workshop with an emphasis on developing longer pieces.
This course is repeatable for 24 credits.

WR 525. ADVANCED SCIENTIFIC AND TECHNICAL WRITING. (4 Credits)
Combines scientific and technical writing with science journalism. Students will draw on a data set (preferably their own) to draft a scientific journal article, short grant proposal, magazine article, and letter of inquiry. They will also critically evaluate and edit documents by reviewing classmates’ drafts.
Equivalent to: PSM 525

WR 540. ADVANCED NONFICTION WRITING. (4 Credits)
Advanced creative nonfiction workshop with an emphasis on developing longer pieces.
This course is repeatable for 24 credits.

WR 541. ADVANCED POETRY WRITING. (4 Credits)
Advanced poetry workshop.
This course is repeatable for 24 credits.

WR 548. MAGAZINE ARTICLE WRITING. (4 Credits)
Writing the magazine article. Analyzing markets and writing query and cover letters, marketing manuscripts to magazines. Interviewing and researching.
This course is repeatable for 8 credits.

WR 549. CRITICAL REVIEWING. (4 Credits)
Writing critical reviews of books, television programs, movies, plays, and restaurants for newspapers and magazines. The role of criticism in popular culture.

WR 566. PROFESSIONAL WRITING. (4 Credits)
Introduces the texts, contexts, and concepts important to the practice of professional communication in organizational contexts, addressing practical writing skills, rhetoric, ethics, and information design. Course readings concern what professional writers do and what theories govern their actions, bridging the gap between real-world problems and academic research.
Recommended: WR 121

WR 575. RHETORICS OF RACE. (4 Credits)
By exploring the interconnected concepts of race, racialization, and racism, Rhetorics of Race problematizes race as a taken-for-granted phenomenon. Through reading, writing, and discussion, class participants study racial formations as historically specific and analyze contemporary forms of racism in the US. Readings and discussion pay close attention to how rhetoric and discourse have the power to reproduce and challenge white supremacy and race-based oppressions. Emphasizing the intersectionality of oppression—that racism necessarily takes place at intersections with other forms of subordination including sexism, homophobia, ableism, etc.—Rhetorics of Race draws from Queer Black Feminism, Chicana@ Feminism, and Critical Race Theory.

WR 585. CONTEMPORARY RHETORIC THEORY. (4 Credits)
Familiarizes students with a range of theories that have significantly contributed to or influenced the field of modern and contemporary rhetorical research. The course examines scholars, concepts, and methodologies that are central to contemporary rhetorical theory, while touching on key critical theorists who, although may be considered outside the field of rhetoric studies, impact the ways in which language, persuasion, and communication are currently understood. From this work, students develop their own perspectives and generate evidence-based arguments concerning those same issues.
Recommended: WR 121

WR 593. THE RHETORICAL TRADITION AND THE TEACHING OF WRITING. (4 Credits)
Major past and contemporary theories of written communication, their historical context, and their impact on writing and the teaching of writing.

WR 595. INTRODUCTION TO LITERACY STUDIES. (4 Credits)
Literacy studies in multidisciplinary contexts. Examines historical, theoretical, and practical relationships among reading, writing, language, culture, and schooling.

WR 597. DIGITAL LITERACY AND CULTURE. (4 Credits)
From pencils to pixels, telegraphs to texts, and semaphores to social networking, Digital Literacy and Culture focuses on the relationships between human expression and the technologies that provide context, meaning, and shape to those expressions.
Recommended: WR 121

WR 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 30 credits.

Applied Journalism Minor

The mission of the Applied Journalism minor is to provide the OSU students already invested in journalistic careers with a formal curriculum of classes and interactive media experiences that position contemporary journalism as innovative, rigorous and devoted to upholding stringent ethical standards, in which participants must implement critical thinking skills that account for global cultural awareness and diversity, while acknowledging the media’s multifarious and ever-expanding role in influencing, shaping and informing society and culture.

Applied Journalism course work will not only enable OSU student journalists to produce clear, concise, accurate stories for all types of media, it will encourage them to develop their abilities as journalistic entrepreneurs proficient at mobilizing whatever media forms best circulate that information. Working with academic advisors in their specific majors, participants in the AJ minor will determine how best to articulate their course work in order to serve their individual interests in audio, video, text, graphic and/or web content – with an academic premium placed on threading any/all of these media forms into innovative blends.

The curricular approach of the AJ minor centralizes a critical interface of classroom study and media experience, while the rigorous internship requirement at the center of the curriculum (one credit per term for a minimum of three credits) keeps students immersed in hands-on engagement via the award-winning facilities at Orange Media Network. By practicing their hand at a variety of broadcast, multimedia and print journalism platforms, the deep interface between curriculum and internship will enable participants to find their journalistic ‘homes,’ revealing the media form they’ll focus on when entering the professional world.
The course offerings coordinated by the School of Writing, Literature and Film and the School of Art and Communication will equip participants with a solid command of the bedrock journalistic skills germane to any media form (data gathering, interviewing, drafting, storytelling, time management, document organization and putting every story through a stringent system of editing and fact-checking), while participating in courses like AJ 490, Media Law and Ethics, and Media Studies will build the capacity to create responsible and ethical communities. Participating in our array of classes, along with taking a leadership role in student- and professionally-run media outlets, will truly enable graduates in the Minor to acquire the journalistic skills crucial to obtain stellar careers in the global media industry.

Minor Code: 796

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<tr>
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<th>Hours</th>
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<td>AJ 311</td>
<td>MEDIA STORYTELLING</td>
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<td>AJ 312</td>
<td>ADVANCED MEDIA STORYTELLING</td>
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<td>AJ 313</td>
<td>PROFESSIONAL PRACTICES IN APPLIED JOURNALISM</td>
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<td>AJ 410</td>
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<td>AJ 490</td>
<td>MEDIA LAW AND ETHICS</td>
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Electives

Select 12 credits from below

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<td>DIGITAL PHOTOGRAPHY</td>
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<td>ART 350</td>
<td>PHOTOGRAPHY ON ASSIGNMENT</td>
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<td>ART 446</td>
<td>DOCUMENTARY PHOTOGRAPHY</td>
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<td>COMM 368</td>
<td>PROPAGANDA AND SOCIAL CONTROL</td>
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<td>NMC 349/ART 349</td>
<td>VIDEO ART</td>
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<td>NMC 409</td>
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<td>NMC 482</td>
<td>DOCUMENTARY</td>
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<td>WR 303</td>
<td>*WRITING FOR THE WEB</td>
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<td>WR 330</td>
<td>*UNDERSTANDING GRAMMAR</td>
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<td>WR 353</td>
<td>WRITING ABOUT PLACES (Ecampus only)</td>
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<td>WR 362</td>
<td>*SCIENCE WRITING</td>
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<td>WR 383</td>
<td>FOOD WRITING</td>
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<td>WR 414</td>
<td>ADVERTISING AND PUBLIC RELATIONS WRITING</td>
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<td>WR 448</td>
<td>MAGAZINE ARTICLE WRITING</td>
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<td>WR 449</td>
<td>CRITICAL REVIEWING</td>
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<td>WR 462</td>
<td>*ENVIRONMENTAL WRITING</td>
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<tr>
<td>WR 497</td>
<td>DIGITAL LITERACY AND CULTURE</td>
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</table>

Total Hours 27

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Creative Writing Graduate Minor (MFA)

Graduate Areas of Concentration

Fiction, poetry, nonfiction writing

Also available at OSU-Cascades.

The MFA Program in Creative Writing on the OSU Corvallis campus is a two-year, high residency, studio/research program that interweaves literary artistic practice and literary scholarship. Tracks in fiction, nonfiction, and poetry are supported by writing workshops led by nationally known writers, as well as by courses in form, craft, and theory. Intensive mentoring during the thesis year, training in creative writing pedagogy, professional internships, and opportunities for outreach and community engagement produce graduates who are both accomplished creative writers and advocates for the role of literary arts in American culture and society.

OSU-Cascades’s Low-Residency MFA is a two-year program combining writing workshop with studies in craft, literature, and vocation. The program offers intensive 10-day residency sessions in June and November and individualized mentorships by nationally known writers throughout the year. The program’s intensive low-residency format is designed to balance the modern writer’s need for both solitude and community, for both self-reliance and responsibility—to give our students the freedom as well as the discipline to write. Our curriculum builds sustainable writing habits, develops skills needed to support a creative livelihood after graduation, and creates an environment for taking imaginative risks.

Major Code: 8920

Cascades Low-Residency MFA Requirements

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<th>Code</th>
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<td>WR 503</td>
<td>THESIS</td>
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<td>WR 513</td>
<td>LOW-RESIDENCY MFA MENTORSHIP</td>
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Total Hours 77

Corvallis MFA Requirements

Please refer to the MFA Handbook on the College of Liberal Arts website (https://liberalarts.oregonstate.edu/wlf/mfa/about/mfa-handbook/).

Major Code: 8920

Creative Writing Graduate Minor

Minor Code: 8920

English Graduate Major (MA)

Graduate Areas of Concentration

Literature and culture; rhetoric, writing, and culture; film and visual studies

The School of Writing, Literature, and Film offers graduate work leading to a Master of Arts degree in English. The major area of concentration may be literature and culture; rhetoric, writing, and culture; or film and visual studies. Graduate work in the school may also be applied to a Master of Arts in Interdisciplinary Studies degree or to minors in other advanced degree programs.

Major Code: 8900
English Graduate Minor

Minor Code: 8900

English Minor

Also available at OSU-Cascades.

Students in the English Minor study the texts of great writers of fiction, non-fiction, poetry, and critical analysis. You’ll learn the history of literary expression from the medieval period through movements like Romanticism and Post-Modernism. You’ll write everything from occasional pieces to complex research papers and you’ll read widely in order to write deeply. Faculty provide detailed feedback on your own creative, interpretive, and purposeful compositions in genres ranging from freewriting.

Students will also learn how to write effective arguments about a variety of literary and cultural texts, use their newfound skills in information literacy to plan and conduct research in English, and recognize and interpret a wide variety of texts and genres. An English minor is a great accompaniment to any other major at OSU.

Minor Code: 890

General English Studies

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td>ENG 204 &amp; ENG 205 &amp; ENG 206</td>
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<td>ENG 253 &amp; ENG 254</td>
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B. Upper Division

Select 12 credits

C. Upper/Lower Division

Select one additional upper- or lower-division English OR one upper-division Writing course

Total Hours 24-28

English Literature Area

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<td>ENG 264</td>
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<td>ENG 205</td>
<td>*SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA</td>
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<td>*SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY</td>
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<td>ENG 201</td>
<td>*SHAKESPEARE</td>
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B. Upper Division

English Literature Courses

Total Hours 28

American Literature Area

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<td>ENG 253</td>
<td>*SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
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<td>*SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT</td>
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<td>Select one of the following:</td>
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<td>ENG 221</td>
<td>*AFRICAN-AMERICAN LITERATURE</td>
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<td>ENG 260</td>
<td>*LITERATURE OF AMERICAN MINORITIES</td>
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<td>ENG 275</td>
<td>*THE BIBLE AS LITERATURE</td>
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<tr>
<td>ENG 317</td>
<td>*THE AMERICAN NOVEL: BEGINNINGS TO CHOPIN</td>
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<td>ENG 318</td>
<td>*THE AMERICAN NOVEL: MODERNIST PERIOD</td>
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<td>ENG 319</td>
<td>*THE AMERICAN NOVEL: POST-WORLD WAR II</td>
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<td>FILM 245</td>
<td>*THE NEW AMERICAN CINEMA</td>
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</table>

B. Upper Division

Courses in American Literature

Total Hours 24

* Baccalaureate Core Course (BCC)

Minor Code: 890

English Undergraduate Major (BA, HBA)

An English degree is about more than the book. English majors learn to see complex problems in their full richness and don’t take the first answer, or the simplest answer, as truth. In our courses, all kinds of texts – from medieval poems to postmodern novels, adapted screenplays to literary criticism itself – appear as windows into the cultures and conditions in which they were produced. English majors develop habits of mind attuned to the reasons why people do what they do and write what they write. Our graduates are engaged, empathetic people pursuing a creative, critical, and useful degree.

The English major includes an array of subjects ranging in literary history to film and visual culture, creative and nonfiction writing, rhetoric and literacy, and the digital humanities. We focus on the big picture and the details: close reading skills and critical analysis, how literacy and language change over time, and how social and historical movements are represented in texts. Reading, writing, active listening, discussing, presenting, and debating are foundational activities in our classrooms. Your first courses will prepare you to understand major historic, cultural, and literary time periods, including surveys of World, U.S., and British literatures and a wide range of elective courses. Upper-division classes call upon you to dig deep into specific authors, historical moments, themes, theories, and writing styles.

Major Code: 890

Undergraduate English majors must attain proficiency in a foreign language, as certified by the School of Language, Culture, and Society, equivalent to that assumed at the end of a second-year language sequence (211/212/213).

A grade of C– or better is required for all courses used to complete major requirements.

Courses taken to satisfy major requirements may not be taken with an S/U grade.
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<td>ENG 204</td>
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<td>ENG 214</td>
<td>*LITERATURE OF THE WORLD: EUROPE</td>
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<td>ENG 253</td>
<td>*SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
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<td>ENG 254</td>
<td>*SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT</td>
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<td>From the following, 12 additional credits (at least 4 credits pre-1800):</td>
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<tr>
<td>ENG 201</td>
<td>*SHAKESPEARE</td>
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<td>ENG 205</td>
<td>*SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA</td>
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<tr>
<td>ENG 206</td>
<td>*SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY</td>
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<tr>
<td>ENG 207</td>
<td>*LITERATURE OF WESTERN CIVILIZATION: CLASSICAL-RENAISSANCE</td>
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<tr>
<td>ENG 208</td>
<td>*LITERATURE OF WESTERN CIVILIZATION: 18TH CENTURY TO PRESENT</td>
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<tr>
<td>ENG 210</td>
<td>*LITERATURES OF THE WORLD: ASIA</td>
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<td>ENG 211</td>
<td>*LITERATURES OF THE WORLD: AFRICA</td>
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<tr>
<td>ENG 212</td>
<td>*LITERATURES OF THE WORLD: Meso/South America, Caribbean</td>
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<tr>
<td>ENG 213</td>
<td>*LITERATURES OF THE WORLD: MIDDLE EAST</td>
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<tr>
<td>ENG 214</td>
<td>*LITERATURE OF THE WORLD: EUROPE</td>
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<tr>
<td>ENG 221</td>
<td>*AFRICAN-AMERICAN LITERATURE</td>
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<tr>
<td>ENG 253</td>
<td>*SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900</td>
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<tr>
<td>ENG 254</td>
<td>*SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT</td>
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<tr>
<td>ENG 260</td>
<td>*LITERATURE OF AMERICAN MINORITIES</td>
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<tr>
<td>Upper Division</td>
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<tr>
<td>ENG 345</td>
<td>INTRODUCTION TO LITERARY CRITICISM AND THEORY</td>
<td>4</td>
</tr>
<tr>
<td>Pre-1800 Literature (Select a minimum of 2 courses, 8 credits):</td>
<td></td>
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<tr>
<td>ENG 412</td>
<td>STUDIES IN BRITISH THEATER AND SOCIETY</td>
<td></td>
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<tr>
<td>ENG 417</td>
<td></td>
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<tr>
<td>ENG 425</td>
<td>STUDIES IN MEDIEVAL LITERATURE</td>
<td></td>
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<tr>
<td>ENG 426</td>
<td>STUDIES IN CHAUCER</td>
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<tr>
<td>ENG 430</td>
<td>STUDIES IN EARLY MODERN LITERATURE</td>
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<td>ENG 433</td>
<td>STUDIES IN THE LONG EIGHTEENTH CENTURY</td>
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<td>ENG 435</td>
<td>STUDIES IN SHAKESPEARE</td>
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<tr>
<td>ENG 490</td>
<td>HISTORY OF THE ENGLISH LANGUAGE</td>
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<td>Post-1800 Literature (Select a minimum of 2 courses, 8 credits):</td>
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<tr>
<td>ENG 317</td>
<td>*THE AMERICAN NOVEL: BEGINNINGS TO CHOPIN</td>
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<tr>
<td>ENG 318</td>
<td>*THE AMERICAN NOVEL: MODERNIST PERIOD</td>
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<tr>
<td>ENG 319</td>
<td>*THE AMERICAN NOVEL: POST-WORLD WAR II</td>
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<tr>
<td>ENG 320</td>
<td>*STUDIES IN PAGE, STAGE, AND SCREEN</td>
<td></td>
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<tr>
<td>ENG 321</td>
<td>*STUDIES IN WORD, OBJECT, AND IMAGE</td>
<td></td>
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<tr>
<td>ENG 322</td>
<td>*STUDIES IN GLOBALISM, TEXT, AND EVENT</td>
<td></td>
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<tr>
<td>ENG 360</td>
<td>*NATIVE AMERICAN LITERATURE</td>
<td></td>
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<tr>
<td>ENG 362</td>
<td>*AMERICAN WOMEN WRITERS</td>
<td></td>
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<td>ENG 374</td>
<td>*MODERN SHORT STORY</td>
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</tr>
<tr>
<td>ENG 418</td>
<td>THE ENGLISH NOVEL: VICTORIAN PERIOD</td>
<td></td>
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<tr>
<td>ENG 419</td>
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<tr>
<td>ENG 434</td>
<td>STUDIES IN ROMANTICISM</td>
<td></td>
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<td>ENG 436</td>
<td>STUDIES IN VICTORIAN LITERATURE</td>
<td></td>
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<td>ENG 438</td>
<td>STUDIES IN MODERNISM</td>
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<td>ENG 440</td>
<td>STUDIES IN MODERN IRISH LITERATURE</td>
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<td>ENG 450</td>
<td>STUDIES IN SHORT FICTION</td>
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<tr>
<td>ENG 470</td>
<td>*STUDIES IN POETRY</td>
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</table>

**Total credits required for graduation:** 180

*See advisor for additional pre- and post-1800 courses.

**Baccalaureate Core Course (BCC)**

**Writing Intensive Course (WIC)**

**Major Code: 890**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ENG 482</td>
<td>STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT</td>
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<tr>
<td>ENG 485</td>
<td>*STUDIES IN AMERICAN LITERATURE</td>
<td></td>
</tr>
<tr>
<td>FILM 452</td>
<td>*STUDIES IN FILM</td>
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<tr>
<td>Electives (12 credits upper-division ENG or WR)</td>
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<td>12</td>
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<tr>
<td>WIC Course (3)</td>
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**Hours** 14-15

**Winter**

| ENG 200 | LIBRARY SKILLS FOR LITERARY STUDY | 1 |
| From one of the following: | |
| ENG 204 | *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660 | 4 |
| ENG 205 | *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA | |
| ENG 206 | *SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY | |
| ENG 253 | *SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900 | |
| ENG 254 | *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT | |
| Language 111 | | 4 |
| PAC Course | | 1-2 |
| Select one of the following: | |
| WR 121 | *ENGLISH COMPOSITION | 3 |
| COMM 111 | *PUBLIC SPEAKING | |
| COMM 114 | *ARGUMENT AND CRITICAL DISCOURSE | |

**Hours** 14-15

**Spring**

| ENG 200 | LIBRARY SKILLS FOR LITERARY STUDY | 1 |
| From one of the following: | |
| ENG 204 | *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660 | 4 |
| ENG 205 | *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA | |
| ENG 206 | *SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY | |
| ENG 253 | *SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900 | |
| ENG 254 | *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT | |
| Language 112 | | 4 |
| Select one of the following: | |
| WR 121 | *ENGLISH COMPOSITION | 3 |
| COMM 111 | *PUBLIC SPEAKING | |
| COMM 114 | *ARGUMENT AND CRITICAL DISCOURSE | |
| Bacc Core Course: Western Culture | | 4 |

**Hours** 16

**Second Year**

**Fall**

| Survey of Literature Elective | | 4 |
Film Studies Minor

The Film Studies minor is designed to give students a coherent introduction to film criticism, theory, and history (what those of us in the field call 'critical studies') as well as more specialized and/or advanced classes in film genres, authors (auteurs), and cultural studies.

Interdisciplinary in approach, film has evolved as a co-discipline of literary studies and as a focused field of study which lends itself to OSU's aspiration to become a truly global university. In baccalaureate core courses in film, students learn to recognize the genres, traditions, and forms of cinematic expression and the cultural contexts in which they have evolved. Building on new literacies and technologies, they learn skills of critical thinking, writing, and research. Advanced film courses contribute to the Literature and Culture area of the MA in English and to interdisciplinary MAIS programs in CLA. Elective courses in critical film studies are popular elective choices for students majoring or minoring in the arts, women's and ethnic studies, foreign languages, anthropology, theater, and English.

Minor Code: 268

- Minimum total credits (including electives): 28
- Minimum total upper-division credits (including electives): 12
- Minimum total credits in FILM classes: 24
- Minimum total upper-division credits in FILM classes: 8

To be selected from:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FILM 110</td>
<td>*INTRODUCTION TO FILM STUDIES: 1895-1945</td>
<td>3</td>
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<tr>
<td>FILM 125</td>
<td>*INTRODUCTION TO FILM STUDIES: 1945-PRESENT</td>
<td>3</td>
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<tr>
<td>FILM 220</td>
<td>*TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION</td>
<td>4</td>
</tr>
<tr>
<td>FILM 245</td>
<td>*THE NEW AMERICAN CINEMA</td>
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<tr>
<td>FILM 255</td>
<td>*WORLD CINEMA PART I: ORIGINS TO 1968</td>
<td>4</td>
</tr>
<tr>
<td>FILM 256</td>
<td>*WORLD CINEMA PART II: 1968-PRESENT</td>
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</tr>
<tr>
<td>FILM 265</td>
<td>*FILMS FOR THE FUTURE</td>
<td>4</td>
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<tr>
<td>FILM 452</td>
<td>*STUDIES IN FILM (can be taken two times for up to 8 credits)</td>
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<tr>
<td>FILM 480</td>
<td>STUDIES IN FILM, CULTURE AND SOCIETY</td>
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<tr>
<td>Any other FILM courses of at least 3 credits</td>
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Electives

Select one to two courses from the following:

German

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<tr>
<td>GER 351</td>
<td>CRITICAL ISSUES OF GERMAN CINEMA</td>
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<tr>
<td>GER 352</td>
<td>DIVIDED SCREEN: GERMAN CINEMA BETWEEN 1945 AND 1990</td>
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<tr>
<td>GER 363</td>
<td>CONTEMPORARY GERMAN CINEMA</td>
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Spanish

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<th>Code</th>
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<tr>
<td>SPAN 439</td>
<td>TOPICS IN MEXICAN CULTURE AS EVIDENCED THROUGH MEXICAN FILM</td>
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Ethnic Studies

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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ES 452</td>
<td>*ETHNICITY IN FILM</td>
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Women Studies

<table>
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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>WGIS 230</td>
<td>*WOMEN IN THE MOVIES</td>
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<tr>
<td>WGIS 235</td>
<td>*WOMEN IN WORLD CINEMA</td>
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<tr>
<td>WGIS 325</td>
<td>*DISNEY: GENDER, RACE, EMPIRE</td>
<td></td>
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</tbody>
</table>
Writing Minor

Also available via Ecampus.

The School of Writing, Literature, and Film offers a Writing Minor that is distinctive and flexible. Coursework toward a the Writing Minor may be taken on-campus or through Ecampus, or with a combination of on-campus and Ecampus courses. Writing minors may also participate in on-campus and off-campus internships for credit.

A distinctive feature of the Writing Minor at OSU (Ecampus and on-campus) is that courses are taught by writing specialists (including tenure-line faculty) in the areas of creative writing and scientific, technical and professional writing. The minor is flexible: you may elect to take courses that highlight your strengths and areas of interest within the writing field, prepare for applications in graduate writing programs (such as MFA in creative writing or professional/technical communication), and enhance communication skills for the workplace.

Some students with aspirations for graduate, law or medical school studies pursue the Writing Minor to better enable themselves to write more proficiently at higher academic levels, where work is more rigorous and written output is expected to be of a very high level. Others engage in the Writing Minor for the pure joy of expressing themselves, and working with ideas and words.

Many students in the writing minor publish works in student publications on campus and in external publications.

Minor Code: 891

Students must receive a grade of C– or better in any course applied toward the minor. Such courses cannot be taken with S/U grading.

The Writing minor requires a minimum of 27 credits, as follows: a minimum of 11 credits from 100- to 300-level writing courses, plus a minimum of 12 credits from 400-level upper-division writing courses, plus one elective upper-division (300/400) 4-credit course in writing or literature.

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>Part A. 100- to 300-level writing courses</td>
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<tr>
<td>WR 199</td>
<td>SPECIAL STUDIES</td>
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<tr>
<td>WR 201</td>
<td>*WRITING FOR MEDIA</td>
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<tr>
<td>WR 214</td>
<td>*WRITING IN BUSINESS</td>
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<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>WR 224</td>
<td>*INTRODUCTION TO FICTION WRITING</td>
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<tr>
<td>WR 239</td>
<td>INTRODUCTION TO WRITING FICTION AND CREATIVE NONFICTION</td>
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<tr>
<td>WR 240</td>
<td>*INTRODUCTION TO NONFICTION WRITING</td>
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<tr>
<td>WR 241</td>
<td>*INTRODUCTION TO POETRY WRITING</td>
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<tr>
<td>WR 303</td>
<td>*WRITING FOR THE WEB</td>
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<tr>
<td>WR 323</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>WR 324</td>
<td>*SHORT STORY WRITING</td>
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<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
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<tr>
<td>WR 329</td>
<td>WRITING FOR LAW AND LAW SCHOOL</td>
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<tr>
<td>WR 330</td>
<td>*UNDERSTANDING GRAMMAR</td>
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<tr>
<td>WR 340</td>
<td>CREATIVE NONFICTION WRITING</td>
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<tr>
<td>WR 341</td>
<td>*POETRY WRITING</td>
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<tr>
<td>WR 362</td>
<td>*SCIENCE WRITING</td>
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<tr>
<td>WR 383</td>
<td>FOOD WRITING</td>
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Part B. 400-level upper-division writing courses

Select a minimum of 12 credits from the following:

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<td>WR 406</td>
<td>PROJECTS</td>
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<td>WR 407</td>
<td>SEMINAR</td>
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<tr>
<td>WR 408</td>
<td>WORKSHOP</td>
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<tr>
<td>WR 411</td>
<td>*THE TEACHING OF WRITING</td>
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<tr>
<td>WR 414</td>
<td>ADVERTISING AND PUBLIC RELATIONS WRITING</td>
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</tr>
<tr>
<td>WR 416</td>
<td>ADVANCED COMPOSITION</td>
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<td>WR 420</td>
<td>STUDIES IN WRITING</td>
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<tr>
<td>WR 424</td>
<td>ADVANCED FICTION WRITING</td>
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<td>WR 441</td>
<td>ADVANCED POETRY WRITING</td>
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<tr>
<td>WR 448</td>
<td>MAGAZINE ARTICLE WRITING</td>
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<td>WR 449</td>
<td>CRITICAL REVIEWING</td>
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<tr>
<td>WR 462</td>
<td>*ENVIRONMENTAL WRITING</td>
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<tr>
<td>WR 493</td>
<td>*THE RHETORICAL TRADITION AND THE TEACHING OF WRITING</td>
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<tr>
<td>WR 495</td>
<td>*INTRODUCTION TO LITERACY STUDIES</td>
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<tr>
<td>WR 497</td>
<td>DIGITAL LITERACY AND CULTURE</td>
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</table>

Part C. Electives

Select one upper-division 4-credit course in film, literature, or writing from the following which does not duplicate any course used in Parts A or B:

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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FILM 452</td>
<td>*STUDIES IN FILM</td>
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<tr>
<td>ENG 311</td>
<td>*STUDIES IN BRITISH PROSE</td>
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<td>ENG 312</td>
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<tr>
<td>ENG 313</td>
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<tr>
<td>ENG 317</td>
<td>*THE AMERICAN NOVEL: BEGINNINGS TO CHOPIN</td>
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<td>ENG 318</td>
<td>*THE AMERICAN NOVEL: MODERNIST PERIOD</td>
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<td>ENG 319</td>
<td>*THE AMERICAN NOVEL: POST-WORLD WAR II</td>
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<tr>
<td>ENG 320</td>
<td>*STUDIES IN PAGE, STAGE, AND SCREEN</td>
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<td>ENG 345</td>
<td>INTRODUCTION TO LITERARY CRITICISM AND THEORY</td>
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<td>ENG 360</td>
<td>*NATIVE AMERICAN LITERATURE</td>
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<td>ENG 362</td>
<td>*AMERICAN WOMEN WRITERS</td>
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<td>ENG 374</td>
<td>*MODERN SHORT STORY</td>
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<tr>
<td>ENG 386/ART 386</td>
<td>A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART I</td>
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<td>ENG 387/ART 387</td>
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<td>ENG 388/ART 388</td>
<td>A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART III</td>
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<td>ENG 412</td>
<td>STUDIES IN BRITISH THEATER AND SOCIETY</td>
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<tr>
<td>ENG 416</td>
<td>*POWER AND REPRESENTATION</td>
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<tr>
<td>ENG 417</td>
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<td>ENG 418</td>
<td>THE ENGLISH NOVEL: VICTORIAN PERIOD</td>
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<td>ENG 419</td>
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<tr>
<td>ENG 420</td>
<td>*STUDIES IN DIFFERENCE, POWER, AND DISCRIMINATION</td>
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<td>ENG 425</td>
<td>STUDIES IN MEDIEVAL LITERATURE</td>
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<td>ENG 426</td>
<td>STUDIES IN CHAUCER</td>
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<td>ENG 430</td>
<td>STUDIES IN EARLY MODERN LITERATURE</td>
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<tr>
<td>ENG 433</td>
<td>STUDIES IN THE LONG EIGHTEENTH CENTURY</td>
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<tr>
<td>ENG 434</td>
<td>STUDIES IN ROMANTICISM</td>
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<td>ENG 435</td>
<td>STUDIES IN SHAKESPEARE</td>
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<td>ENG 436</td>
<td>STUDIES IN VICTORIAN LITERATURE</td>
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<td>ENG 438</td>
<td>STUDIES IN MODERNISM</td>
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<td>ENG 440</td>
<td>STUDIES IN MODERN IRISH LITERATURE</td>
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<tr>
<td>ENG 445</td>
<td>*STUDIES IN NONFICTION</td>
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</tr>
</tbody>
</table>
College of Pharmacy

The College of Pharmacy is dedicated to advancing societal health through leadership in pharmacy education, research, community engagement, and improved patient care.

Website: http://pharmacy.oregonstate.edu/

Administration

Grace Kuo, Dean, 541-737-5450, grace.kuo@oregonstate.edu
Gary DeLander, Executive Associate Dean, 541-737-5805, gary.delander@oregonstate.edu
Mark Leid, Associate Dean for Research, 541-737-5809, mark.leid@oregonstate.edu
David Bearden, Associate Dean for Academic Integration and Clinical Advancement, 503-494-0116, david.bearden@oregonstate.edu
Juancho Ramirez, Assistant Dean, Office of Experiential Education, 503-494-1316, ramirez@ohsu.edu
Theresa Filz, Chair, Department of Pharmaceutical Sciences, 541-737-5802, theresa.filz@oregonstate.edu
Jon Furuno, Chair, Department of Pharmacy Practice, 541-418-9361, furuno@ohsu.edu
Paige Clark, Director of Alumni Relations and Professional Development, 503-494-3476, paige.clark@oregonstate.edu
Angela Austin Haney, Director of Student Services/Head Advisor, 541-737-5784, angela.austinhaney@oregonstate.edu
Tanya Ostrogorsky, Director of Assessment and Faculty Development, 503-494-6567, ostrogorsky@oregonstate.edu
Shannon Starwalt, Director of Introductory Pharmacy Practice Experiences, 541-737-8035, shannon.starwalt@oregonstate.edu
Dean Haxby, Director of Drug Use Research and Management Program, 503-494-1590, haxbyd@ohsu.edu
Jennifer Davis, Director of Pharmacy, Student Health Services, 541-737-7617, jennifer.davis@oregonstate.edu
Brian Bowers, Director of Pharmacy, Veterinary Teaching Hospital, 541-737-6863, brian.bowers@oregonstate.edu
Patty Beaumont, Executive Assistant to the Dean, 541-737-5796, patty.beaumont@oregonstate.edu

College of Pharmacy

The College of Pharmacy’s Doctor of Pharmacy (PharmD) Program and PharmD degree are jointly conferred by Oregon State University and Oregon Health & Science University. The Doctor of Pharmacy Program is accredited by the Accreditation Council for Pharmacy Education (http://www.acpe-accredit.org/), 190 S. LaSalle Street, Suite 2850, Chicago, IL 60603-3410, Phone 312-664-3575; Fax, 866-228-2631. Oregon State University College of Pharmacy is a member of the American Association of Colleges of Pharmacy.

A petition from the pharmacists of Oregon led to the establishment of the Department of Pharmacy at Oregon State College in 1898. The department grew steadily and in 1917 became the School of Pharmacy. In 1983, it became the College of Pharmacy.

There are many career options available to individuals having a pharmacy degree. Opportunities for graduates include several different options to provide patient care in community or institutional practice to private consulting and long-term practice settings. The pharmaceutical industry offers careers in many areas including, health professions education, public and government relations, manufacturing, and basic research. Pharmacy graduates are also employed in various local, state and federal health agencies, including the U.S. Public Health Service and the Department of Veterans Affairs. Individuals who decide to pursue advanced professional or graduate training may follow a career in research, advanced patient care settings, and academics.

Minor Code: 891

Course Descriptions

ENG 450 STUDIES IN SHORT FICTION
ENG 454 MAJOR AUTHORS
ENG 460 STUDIES IN DRAMA
ENG 465 STUDIES IN THE NOVEL
ENG 470 *STUDIES IN POETRY
ENG 475 STUDIES IN CRITICISM
ENG 480 STUDIES IN LITERATURE, CULTURE AND SOCIETY
ENG 482 STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT
ENG 485 *STUDIES IN AMERICAN LITERATURE
ENG 486 STUDIES IN BRITISH LITERATURE
ENG 488 LITERATURE AND PEDAGOGY
ENG 489 WRITING, LITERATURE AND MEDICINE
ENG 490 HISTORY OF THE ENGLISH LANGUAGE
ENG 497 *INTERNATIONAL WOMEN’S VOICES
ENG 498 WOMEN AND LITERATURE
ENG 499 SELECTED TOPICS

Writing Electives

WR 324 *SHORT STORY WRITING
WR 341 *POETRY WRITING
WR 383 FOOD WRITING
WR 399 SPECIAL TOPICS
WR 399H SPECIAL TOPICS
WR 401 RESEARCH AND SCHOLARSHIP
WR 402 INDEPENDENT STUDY
WR 403 THESIS
WR 404 WRITING AND CONFERENCE
WR 405 READING AND CONFERENCE
WR 406 PROJECTS
WR 407 SEMINAR
WR 408 WORKSHOP
WR 411 *THE TEACHING OF WRITING
WR 414 ADVERTISING AND PUBLIC RELATIONS WRITING
WR 416 ADVANCED COMPOSITION
WR 420 STUDIES IN WRITING
WR 424 ADVANCED FICTION WRITING
WR 441 ADVANCED POETRY WRITING
WR 448 MAGAZINE ARTICLE WRITING
WR 449 CRITICAL REVISING
WR 452 *ENVIRONMENTAL WRITING
WR 493 *THE RHETORICAL TRADITION AND THE TEACHING OF WRITING
WR 495 *INTRODUCTION TO LITERACY STUDIES
WR 499 SPECIAL TOPICS

Total Hours 27

* Baccalaureate Core Course (BCC)
* Writing Intensive Course (WIC)
College of Pharmacy graduates are eligible for licensure as pharmacists throughout the United States.

Pharmacy Information
Professional pharmacy education has advanced both in Oregon and throughout the United States to meet the expectations of an evolving health care system. To be eligible for admission to the PharmD program students complete the PharmD prerequisites, which typically require three to four years of college study. Completion of the pharmacy professional program requires an additional four years.

After completion of the four-year professional pharmacy program, the graduate is eligible to take a licensing exam administered by state boards of pharmacy. After passing the licensing exam, the graduate is licensed to practice as a registered pharmacist. Most graduates become licensed as pharmacists within approximately three months after graduation from Oregon State University.

PharmD Prerequisites
The College of Pharmacy Admissions committee carefully reflects on the overall preparation of each candidate. The profession of pharmacy requires pharmacists to have the knowledge, skills and perspectives necessary to work collaboratively in the provision of outstanding patient care.

Required PharmD prerequisite courses may be taken at Oregon State University or any other accredited college or university. Required courses must be taken for a letter grade; however, an exception may be made if a course is only offered pass/no pass. The student should make a specific request for waiver of grade requirement directly to the College of Pharmacy Admissions Committee prior to taking the course.

Students from community colleges or other colleges and universities can request evaluation of their transcript and planned coursework, if there are questions regarding prepharmacy coursework equivalencies. The PharmD prerequisite (http://pharmacy.oregonstate.edu/pharm-d-prerequisites/) coursework must be completed prior to beginning the professional program.

Early Assurance Program
The Early Assurance Program (https://pharmacy.oregonstate.edu/eap-oregon-early-assurance-program/) provides highly qualified students an opportunity to assure availability of a position in the College of Pharmacy Doctor of Pharmacy (PharmD) program, following completion of admission requirements. Students admitted or enrolled in an accredited community college, college, or university are eligible to apply for the Early Assurance Program. Students accepted into the Early Assurance Program are expected to maintain certain academic criteria, but also engage in professional development opportunities that will enhance readiness for their application to the professional program.

The Professional Pharmacy Program
Enrollment in the four-year professional program is limited. Students must apply for admission (http://www.pharmcas.org/) to the professional pharmacy program. Contact the OSU College of Pharmacy (http://pharmacy.oregonstate.edu/) for other information. Students are admitted to the professional program beginning fall term only.

Once admitted to the professional program, students may register only for those courses for which they have completed the stated prerequisite courses. Exceptions are allowed only after approval by the College of Pharmacy's Academic and Professional Standards Committee. Students complete the first two years of their course work on the Oregon State University Corvallis campus. The third professional year is at the College of Pharmacy Satellite Campus at Oregon Health and Science University in Portland, Oregon. Most students choose to live in the Portland area during the third year, but a limited number of students may apply to complete part of the didactic coursework in Corvallis using distance technology. The fourth year is off-campus at various pharmacy practice sites throughout the state of Oregon and the Northwest, including Hawaii. Contact the college directly for additional information about the PharmD curriculum.

Immunization and vaccination requirements for PharmD students are stricter than for other university students. PharmD students must satisfy all college immunization and vaccination requirements before starting classes and each year in the program. Failure to meet these requirements may delay enrollment.

The four-year professional pharmacy program provides a broad, scientifically based, clinically focused education. Through appropriate selection of professional elective courses in the fourth year, a student may concentrate in such areas as community, institutional, geriatric, or managed care pharmacy; and prepare for residencies, fellowships, or other post-graduate study.

The pharmacy profession is experiencing profound changes. These changes include an increased focus toward patient care, in addition to the study of pharmaceutical products. All students will be required to give immunizations (shots), take medical histories from patients, and perform physical examinations. These experiences will involve asking sensitive questions and physically touching other people. Throughout the curriculum, students are assigned to off-campus practice sites where they are supervised by licensed pharmacists who are affiliate faculty members of the college. Completion of experiential courses at these off-campus practice sites in the fourth professional year generally requires up to 40 hours per week at the practice site. Experiential courses may include nights, evenings, and weekends. Practice sites are varied but include community pharmacies, hospitals, long-term care facilities, and outpatient clinics. PharmD students are required to provide their own transportation to sites.

The College of Pharmacy requires all pharmacy students to complete criminal background checks and recommends that all pharmacy students submit to drug screening. Criminal background checks and drug screenings have become standard requirements for employment in a pharmacy and placement in experiential rotations. Criminal background checks and drug screening may also be required for licensure. Students who cannot participate in experiential rotations due to criminal or other activities of concern that are revealed in criminal background checks or drug screenings may be unable to fulfill the requirements of the professional PharmD program. Therefore, it is in everyone's interest to resolve any issues prior to commitment of resources by the college and by students.

PharmD students must immediately disclose any criminal activity that occurs prior to or while enrolled in the PharmD program. PharmD students must immediately reveal any action taken by a Board of Pharmacy, including but not limited to warning, probation and revocation of licensure. Failure to do so could result in dismissal from the PharmD program.

To become licensed by the state of Oregon to practice pharmacy, an individual must meet the following criteria:
1. Possess a baccalaureate or PharmD degree in pharmacy from an accredited U.S. college of pharmacy,
2. Pass the North American Pharmacist Licensing Exam (NAPLEX), the Multistate Pharmacy Jurisprudence Examination (MPJE), and

**Professional Associations**

Students are strongly encouraged to engage in professional development through membership in professional organizations. The Oregon State Student Pharmacists is an umbrella professional development organization for pharmacy students that includes the opportunity to be involved in several national and state professional organizations.

Professional organizations represented at Oregon State University include:

**American Pharmacist Association, Academy of Students of Pharmacy** leads the profession and equips members for their role as the medications expert in team-based, patient-centered care across all practice settings. The Oregon State Pharmacists Association is the state affiliate of this organization.

**American Society of Health-System Pharmacists** represents pharmacists who serve as patient care providers in acute and ambulatory care settings. The Oregon Society of Health-System Pharmacists is the state affiliate of this organization.

**American College of Clinical Pharmacy** is a professional and scientific society that enables clinical pharmacists to achieve excellence in practice, research and education.

**Academy of Managed Care Pharmacy** supports members to apply clinical evidence, and sound medication management principles and strategies to improve health care for all.

**American Society of Consultant Pharmacists** represents pharmacy professionals and students devoted to optimal medication management and improved health outcomes for all older adults.

**College of Psychiatric & Neurologic Pharmacists** is dedicated to providing individuals living with mental illness, including those with substance use and neurologic disorders, appropriate and effective treatment.

**Industry Pharmacists Organization** supports the interests of industry pharmacists in contributing to the development, commercialization, promotion, and optimal use of medicines.

**National Community Pharmacists Association** members are dedicated to the continuing growth and prosperity of independent community pharmacy in the United States.

**Student National Pharmaceutical Association** is affiliated with the National Pharmaceutical Association. This organization is dedicated to representing the views and ideals of minority pharmacists and serving healthcare needs of minority communities.

**Rho Chi Honor Society**—Membership in Beta chapter of Rho Chi, national pharmaceutical honor society, is selective and based on high scholastic achievement.

**Phi Lambda Sigma**—Membership in the Beta Zeta chapter of the national fraternity is limited to qualified individuals who meet requirements for professional development and leadership.

**Phi Delta Chi**—Membership in the Beta Iota chapter of this 100-year-old national pharmacy fraternity is limited. Individuals must meet the pledge requirements.

**American Association of Colleges of Pharmacy**—Any student may apply for membership in this organization that represents members and institutions engaged in pharmacy education in the U.S.

**Scholarships and Loans**

Information about scholarships and loans is available from the College of Pharmacy website and the Office of Financial Aid and Scholarships, 541-737-2241.

**WICHE Program**

The College of Pharmacy accepts students supported through the Western Interstate Commission for Higher Education (WICHE) Professional Student Exchange Program. This interstate program provides the opportunity for students from the 12 cooperating states to obtain professional training not available in their home states. Residents from the states of Alaska and Nevada are eligible to apply for support in pharmacy.

To apply, the applicant must become 'certified' by their home state. Applicants must apply to their home offices before October 15 prior to the academic year in which they plan to enroll. State certifying office contact information is available online (http://wiche.edu/psep/cert-off/).

**Admission Standards**

**Equal Opportunity and Disability Accommodation**

The College of Pharmacy, as a part of Oregon State University, is committed to the principle of equal opportunity. The college does not discriminate on the basis of race, color, creed, religion, national origin, gender, sexual orientation, age, marital status, disability, and disabled veteran or Vietnam-era veteran status. When requested, the college will provide reasonable accommodation to otherwise qualified students with disabilities. Disabled students must work with and be approved by the Disability Access Services office.

**Essential Characteristics of Student Pharmacists**

The essential characteristics of student pharmacists identified below are drawn from a number of different resources that govern the professional expectations of pharmacists and student pharmacists, including but not limited to the national Pharmacy Code of Ethics, the Oath of a Pharmacist, and the Pledge of Professionalism. Please see Appendices to view these resources. The essential characteristics are intended to ensure that student pharmacists and pharmacists educated at the College of Pharmacy (the ‘college’) have the capacity to meet federal and state regulations and policies that pertain to pharmacy, and to meet or exceed expectations that the public has for professional competence and behavior among pharmacy professionals.

Academic and professional environments present different challenges, but the essential characteristics required to succeed in pharmacy are common to both settings. Students in the college must observe and fulfill the essential characteristics, which have been divided into the following relevant categories: intellectual ability, empathetic and collegial communication skills, psychomotor skills, respect for diversity, high ethical standards, and behavioral and social expectations. Under each category are examples that describe and clarify these essential characteristics.
Intellectual Ability
- Comprehend, interpret and analyze new information
- Reason and carry out evidence-based decision making
- Use critical thinking skills and problem solving to evaluate information from multiple sources and synthesize a plan of action
- Thrive in a rigorous foundational and clinical science-based curriculum
- Participate in self- and programmatic-assessment intended to sustain a continual improvement process
- Be curious and pursue lifelong learning

Empathetic and Collegial Communication Skills
- Formulate concise, accurate synopses of essential information
- Contribute in a meaningful and collaborative manner in group discussions
- Interact constructively with other members of a health care team
- Communicate difficult concepts orally and in writing at an appropriate level for specific patients or audiences
- Listen empathetically and develop rapport
- Appropriately display and interpret nonverbal communication signals
- Communicate fluently in English
- Effectively utilize resources to communicate in non-English languages

Psychomotor Skills \(^1\)
- Participate effectively in preparation and distribution of sterile and non-sterile drug products
- Utilize and analyze information from varied sensory inputs
- Participate in drug administration, including injections
- Carry out tasks required for objective and subjective assessment of patient health
- Discern critical elements of a problem through observation

\(^1\) Students may be able to be admitted and progress to graduation while not possessing selected psychomotor skills. In the instance of a documented disability, the college will work to provide reasonable accommodation. The absence of some skills, however, may limit the variety of settings in which a pharmacist can work.

Respect for Diversity
- Communicate in a manner that respects all individuals
- Proactively seek ways to provide an inclusive environment that addresses unique patient needs
- Provide care without judgment of a patients’ personal choices or situation
- Individualize care with consideration of cultural norms for the patient
- Individualize care with consideration of unique therapeutic needs or challenges

High Ethical Standards
- Maintain confidentiality
- Act with compassion, empathy and altruism
- Accept responsibility and provide leadership
- Abstain from illicit drug use
- Act with integrity and expect the same of professional colleagues

Behavioral and Social Expectations
- Demonstrate a history of appropriate behavior in personal actions
- Perform effectively and display sound judgment while under stress
- Perform appropriately in academic or professional settings
- Address disagreements with tact and avoid public altercations
- Exhibit the capacity to adapt to change readily and adjust responses in dynamic, unpredictable situations
- Accept constructive criticism and adapt behavior

Requirements for Progression
Doctor of Pharmacy (Pharm.D.) students must meet university requirements and standards and adhere to the university Student Conduct Regulations (http://studentlife.oregonstate.edu/studentconduct/). The College of Pharmacy has adopted additional requirements to assure that all pharmacy graduates have the best possible educational background and preparation for their pharmacy practice careers. College of Pharmacy standards may vary from or exceed the university standards in order to ensure compliance with policies, regulations and expectations specific to the pharmacy profession.

Students are expected to meet specific academic and professional requirements to matriculate in the College of Pharmacy and to progress to each successive year of the professional program. Each student’s standing is reviewed at the end of every term, or at any time in the interim ‘for cause’. The review includes core pharmacy term GPA, cumulative GPA, and other characteristics identified as being essential to student pharmacists and pharmacists.

The professional Pharm. D. degree program at Oregon State University is designed to be completed within four years. The program combines didactic courses, structured clinical practice experiences, personal and professional development opportunities and, optimally, significant work experience. Our goal is to educate pharmacists that have a combination of foundational strength, and currency of knowledge and skills that will enable them to be change agents for pharmacy and societal health. In order to assure currency and in-depth knowledge for each graduate, the professional program must be completed within a five year period.

To begin the first professional year, students must:
- Receive, and respond in a timely manner, to an offer of admission
- Complete all pre-pharmacy courses with a grade of C- or better
- Successfully complete a background check and meet College-established guidelines \(^4\)
- Successfully complete a drug screen and meet College-established guidelines \(^4\)
- Attend the first year professional orientation program, and verify an understanding and acceptance of College of Pharmacy policies and procedures
- Verify an understanding and acceptance of College of Pharmacy policies and procedures as they pertain to experiential learning
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College.
- Hold current Healthcare Provider CPR and First Aid certification from an approved provider
- Obtain an Oregon Pharmacy Intern license

To advance into the second professional year, students must:
To advance into the third professional year, students must:

- Successfully complete all courses included in the curriculum of the first professional year with a cumulative pharmacy GPA of 2.00 and a P in all P/N (Pass/No Pass) courses
- Have no more than one D grade in pharmacy courses
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.
- Meet site specific requirements for all assigned experiential rotations*
- Verify an understanding and acceptance of College of Pharmacy policies and procedures as they pertain to experiential learning
- Have a current Oregon Pharmacy Intern license
- Have a current Healthcare Provider CPR certification from an approved provider

To advance into the fourth professional year, students must:

- Successfully complete all courses included in the curriculum of the first three professional years with a cumulative GPA of 2.00 and a P in all P/N courses
- Have no more than one D grade in pharmacy courses
- Meet all immunization requirements established by the College
- Meet site specific requirements for all assigned experiential rotations*
- Verify an understanding and acceptance of College of Pharmacy policies and procedures as they pertain to experiential learning
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.
- Have a current Oregon Pharmacy Intern license
- Have a current Healthcare Provider CPR certification from an approved provider

To graduate with the Pharm.D. degree, students must:

- Have met all requirements defined for progression through the first, second, third, and fourth professional years
- Successfully complete all required and elective rotations with a passing grade; and complete all requirements associated with co-curricular (non-credit) activities
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.
- Concerns revealed in background checks or drug screening which could impact progression will be evaluated on a case-by-case basis. Concerns may also impact progression by preventing licensure or placement in experiential sites
- Experiential sites may require additional background checks and drug screenings

**Student Standing in the College of Pharmacy**

The Academic and Professional Standards Committee (APSC) may, at any time, review a student’s standing in the college. APSC is charged with ensuring that students are aware of academic performance or behavior which is not consistent with essential characteristics of student pharmacists and that, therefore, places their completion of the PharmD program at risk. Academic performance and behavioral concerns are often evaluated independently but have equal significance in determining whether a student is meeting the essential characteristics of student pharmacists. Severe, continuing or repeated academic or behavioral problems can result in dismissal from the PharmD program.

APSC, when necessary, provides student standing information to communicate performance deficits, insufficient student progress, and lack of progress in a student addressing academic or behavioral problems. APSC and the college’s director of student services/head advisor provide students guidance regarding what the college expects from a student to increase their opportunities for success in the college. Student performance and progress are evaluated on a case-by-case basis, utilizing the experience of APSC members. APSC uses good faith, informed judgment to determine appropriate recommendations for each student’s situation.

The following student standing notifications may be received by students who are demonstrating performance deficits or insufficient progress in the PharmD program:

**Warning**

Warning status is cautionary and identifies student performance which may place a student’s completion of the PharmD program at risk. Students are placed on warning status if they have a term core pharmacy GPA of less than 2.5 or receive 2 or more C grades in core or elective professional courses in a term. Students may also be placed on Warning status if they engage in behavior that does not meet the Essential Characteristics of Student Pharmacists.

- The first time students are placed on Warning status, they must meet with the Director of Student Services/Head Advisor to discuss their situation.
- The second time students are placed on Warning status, they must meet with the Director of Student Services/Head Advisor and develop a holistic action plan for overcoming academic and non-academic barriers to success. They must subsequently execute this action plan.
- The third time students are placed on Warning status, they are automatically placed on Probation.
**Probation**

Probation status identifies an academic or behavioral concern that places the student's completion of the PharmD program at serious risk. Probation may be accompanied by a delay in progression at the determination of the APSC.

Students are placed on Probation status if they have a term core pharmacy GPA of less than a 2.0 or if they receive a C− or lower grade in any core or elective professional course. A third warning automatically results in Probation.

Student behavior that is a significant departure from the Essential Characteristics of Student Pharmacists will also result in Probation status. Such behavior includes, but is not limited to, violations of Academic Integrity policies, criminal violations, repeated or intentional violation of college policies, or significant breaches of the University Student Conduct Code (http://studentlife.oregonstate.edu/studentconduct/).

Students on Probation status must follow recommendations of the APSC and the Director of Student Services/Head Advisor. Students on Probation status must meet with the Director of Student Services/Head Advisor following each term to review their progress and standing in the college. Students that successfully fulfill the recommendations prescribed will be removed from Probation status.

Students that fail to follow or are unsuccessful in fulfilling the recommendations will be suspended and evaluated for dismissal from the college. Students who are placed on Probation status for the second time will also be evaluated for dismissal from the college.

**Suspension**

Students that have failed to make adequate progress, or who have displayed severe or repeated departures from the Essential Characteristics of Student Pharmacists, may be placed on Suspension status. The college will place an indefinite hold on the progression of a student placed on Suspension status until APSC can adequately evaluate whether the student will be allowed to continue in the PharmD program. Students engaged in an appeal of their dismissal from the college will also be placed on Suspension status.

Students placed on Suspension status will not be allowed to progress in the PharmD program. APSC will review the status of a student on Suspension no later than the beginning of the next academic term. After review, ASPC may recommend immediate Dismissal from the college, recommend that the student be continued on Suspension status pending receipt of additional information, or prescribe a plan to address specific concerns that resulted in the student's Suspension status. If a plan for progression is developed by APSC, the student will be changed to Probation status. If at any time it becomes evident that the student will not be able to address concerns and graduate within the required five-year window, the student will be dismissed immediately.

**Dismissal**

Students will be dismissed from the professional program if they are not making adequate academic progress, or if they fail to constructively address professional or behavioral concerns.

**Graduate Programs**

**Majors**

- Pharmaceutical Sciences (p. 828)

**Minors**

- Pharmaceutical Sciences (p. 828)

**Professional Programs**

- Doctor of Pharmacy (p. 828)

**Faculty**

**Professors** Bearden, Block (Emeritus), Christensen (Emeritus), Kioussi, Kradjan (Emeritus), Leid, Mahmud, McPhail, Olyaei, Stevens, Williams, Zabriskie (Emeritus)

**Associate Professors** Alani, DeLander, Filtz, Furuno, Hartung, Haxby (Emeritus), A. Indra, Irwin, Ishmael-Leid, McGregor, Morgun, Munar, Philmus, Proteau, Sikora, Singh, Taratula

**Assistant Professors** Anderson, Brown, Castner, David, Herink, Lee, S. Ramirez, Sahay, Suchy, Sun, Zumach

**Senior Instructor II** Zweber

**Senior Instructor I** Linares

**Instructors** Chase, Morley, Olstad, Schnabel, Starwalt

**Professional Faculty** Allison, Alston, Austin Haney, Beaumont, Bookman, Bowers, Clark, Corwin, Davis, Mettie, Ostrogorsky, Peters, J. Ramirez

**Research Faculty**

**Professor, Sr. Research** Simonson

**Associate Professors, Sr. Research** G. Indra, Miranda, Taratula

**Assistant Professor, Sr. Research** Zielke

**Courtesy Faculty and Preceptors**

The College of Pharmacy utilizes practicing pharmacists, physicians, and pharmaceutical scientists as lecturers in the professional pharmacy program and in the college's graduate education program. This group includes over 400 pharmacy preceptors that provide individualized guidance for students in Introductory and Advanced Pharmacy Practice Experiences that extend throughout the professional curriculum. All of these individuals make significant contributions to student learning and assure currency of the educational programs in the College of Pharmacy.

**Pharmacy**

**PHAR 001. SERVICE LEARNING. (0 Credits)**

Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.

**PHAR 002. LEADERSHIP. (0 Credits)**

Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

**PHAR 201. PHARMACY ORIENTATION. (1 Credit)**

Career opportunities in pharmacy including community and institutional practice, government, and industry. Discussion of available educational pathways. Open to non-pharmacy students. Graded P/N.
PHAR 210. TERMINOLOGY OF THE HEALTH SCIENCES. (2 Credits)
Provides the student in any of the health science disciplines or pre-professional studies with a working knowledge of the terminology used in the health sciences. Open to non-pharmacy students.

PHAR 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 405. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 407. SEMINAR. (1-16 Credits)
One-credit section. Graded P/N.
This course is repeatable for 16 credits.

PHAR 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 503. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

PHAR 505. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 507. SEMINAR. (1-16 Credits)
One-credit section. Graded P/N.
This course is repeatable for 16 credits.

PHAR 525. FOUNDATIONS OF DRUG ACTION I. (3 Credits)
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug absorption and distribution, drug design and characterization of drug interactions with specialized cellular components, and drug biotransformation or excretion.

PHAR 526. FOUNDATIONS OF DRUG ACTION III. (3 Credits)
Drug actions in the autonomic nervous system (ANS) provide a template for understanding drug actions throughout the body. This course provides a complete consideration of pharmacologic and medicinal chemistry principles as they relate to drug interactions with the ANS. Treatment options for selected diseases that respond to drugs acting on the ANS are also addressed.

PHAR 527. FOUNDATIONS OF DRUG ACTION II. (3 Credits)
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug activation of biological response via biochemical or molecular transduction mechanisms, pharmacogenetics and pharmacogenomics, and drug-induced toxicities.

PHAR 537. BIOORGANIC CHEMISTRY. (3 Credits)
A contemporary treatment of the chemistry, enzymology and molecular genetics techniques used in studying major natural products biosynthesis pathways in nature. Offered alternate years.
Recommended: (CH 530, CH 531, CH 535) and (BB 590, BB 591, BB 592)

PHAR 563. CANCER AND CHEMOPREVENTION. (2 Credits)
A summary of mechanisms of cancer progression, how cancer is detected, and introduction to chemoprevention using targeted therapy and alternative medicine.
Recommended: (BB 451 or BB 551) and BI 314 and (BI 460 or BI 560) or second year standing in the PharmD program

PHAR 571. EXPERIMENTAL APPROACH TO BIOPHARMACEUTICS. (3 Credits)
Experimental protocol, rationale, and procedures in clinical pharmacokinetic, pharmacokinetic, and biopharmaceutical experiments.
Recommended: PHAR 750

PHAR 572. APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS. (3 Credits)
Pharmacokinetics and bioavailability of drugs in clinical care, including changing disease states.

PHAR 573. CURRENT TOPICS IN PHARMACEUTICAL SCIENCES. (1-3 Credits)
Critical evaluation of contemporary pharmaceutics and pharmacokinetics research articles.
This course is repeatable for 9 credits.

PHAR 574. NANOMEDICINE. (3 Credits)
Introduction to the interdisciplinary field of nanomedicine, the use of nanoscale (1-100 nm) phenomena and materials in biomedical applications. Reviews the basic principles of nanotechnology relevant to areas such as diagnostic/molecular imaging, drug delivery, and other novel therapeutics. Topics will be described through both survey of historical developments and the latest scientific developments in the field of nanomedicine.

PHAR 591. PHARMACOLOGY I. (5 Credits)
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacological rationale for therapeutic and toxicologic treatment outcomes.

PHAR 592. PHARMACOLOGY II. (5 Credits)
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacologic rationale for therapeutic and toxicologic treatment outcomes.

PHAR 593. PHARMACOLOGY III. (5 Credits)
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacologic rationale for therapeutic and toxicologic treatment outcomes.

PHAR 601. RESEARCH. (1-16 Credits)
This course is repeatable for 99 credits.

PHAR 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PHAR 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 609. INTRODUCTION TO GRANT PROPOSAL WRITING. (2 Credits)
To introduce students to the fundamentals of writing grant proposals to the National Institute of Health (NIH), different funding mechanisms, as well as the grant reviewing process. CROSSLISTED as PHAR 669/VMB 669.
Equivalent to: VMB 669
This course is repeatable for 20 credits.

PHAR 699. SPECIAL TOPICS IN PHARMACEUTICAL SCIENCES. (3 Credits)
This course is repeatable for 99 credits.

PHAR 701. RESEARCH AND SCHOLARSHIP. (1-8 Credits)
Research conducted by professional pharmacy students under faculty supervision.
This course is repeatable for 12 credits.

PHAR 703. THESIS. (1-8 Credits)
Independent study and analysis that culminates in a thesis.
This course is repeatable for 999 credits.
PHAR 704. RESEARCH SEMINAR. (1 Credit)
This course is repeatable for 2 credits.
Recommended: First or second year standing PharmD program

PHAR 705. READING AND CONFERENCE. (1-8 Credits)
May be repeated for credit.
This course is repeatable for 12 credits.

PHAR 706. INTRODUCTION TO HEALTH DISPARITIES. (2 Credits)
An examination of the multifaceted issue of health disparities in the U.S. healthcare system. Marginalized groups with disparities based upon racial/ethnic, gender, sexual preference and identity, disability, physical and mental health, geography and socioeconomics will be examined at the individual, systematic, and institutional levels.
Recommended: PHAR 707

PHAR 707. CAREER PERSPECTIVES AND PROFESSIONAL DEVELOPMENT. (2 Credits)
Students will explore the necessary knowledge, skills and abilities in order to support professional role formation and ongoing professional development. Students will practice skills related to identifying personal strengths and weaknesses, building self-awareness, creating professional job search materials, communicating professionally in written and oral formats, and participating as a team member.
Recommended: First-year standing in the PharmD program

PHAR 708. INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE I. (2 Credits)
Students will be placed in community pharmacies for experiential rotations. Students will gain an understanding of the scope of practice and roles of pharmacy personnel while demonstrating skills related to processing and dispensing functions in the community setting. Students will observe patient counseling and have an opportunity to conduct medication reviews to identify any drug-related problems. In-class discussions of patient cases will explore concepts relating to ethical decision-making, cultural sensitivity and coordinated pharmacy practice topics with other first-year courses.
Recommended: PHAR 707

PHAR 709. INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE II. (2 Credits)
Students will be placed in community pharmacies for experiential rotations. Students will gain an understanding of the scope of practice and roles of pharmacy personnel while demonstrating skills related to processing and dispensing functions in the community setting. Students will observe patient counseling and have an opportunity to conduct medication reviews to identify any drug-related problems. In-class discussions of patient cases will explore concepts relating to ethical decision-making, cultural sensitivity and coordinated pharmacy practice topics with other first-year courses.
Recommended: PHAR 708

PHAR 711. FUNDAMENTALS OF INTERPROFESSIONAL COLLABORATION. (1 Credit)
The first professional year IPE Series is a yearlong course focusing on interprofessional education for students from local colleges (LBCC/OSU/WesternU) representing programs in medical assistant, pharmacy, nursing and osteopathic medicine. Students develop a positive perspective of working with other disciplines, enhanced understanding of their specific role and responsibilities on an interprofessional team, recognize the value of other disciplines providing patient-centered care, and develop a shared accountability for providing patients with safe, high-quality health care.
Recommended: First-year standing in the PharmD program

PHAR 712. FOUNDATIONS OF PATIENT SAFETY AND INTERPROFESSIONAL PRACTICE. (1 Credit)
Techniques, best practices and opportunities for improving patient safety through interprofessional teamwork. Graded P/N.

PHAR 713. SPANISH FOR PHARMACY PROFESSIONALS. (2 Credits)
For the pharmacy professional with little or no Spanish language background (those with some Spanish language skills would find it beneficial). The course is presented in a video format with in-class facilitator for discussion. Provides basic Spanish grammar instruction but the focus will be on vocabulary and communication in a community pharmacy environment.

PHAR 714. COMPLEMENTARY MEDICINE. (3 Credits)
Covers vitamins and microminerals and their role in biochemical processes, maintaining health and preventing disease. The course also covers the etiology of obesity and treatment modalities. The course builds upon the general background of students in biochemistry and physiology to provide a common baseline of knowledge and allow for integration of concepts required to understand preventive medicine.
Recommended: PHAR 729 and PHAR 735

PHAR 715. PRESCRIPTION DRUG ABUSE. (2 Credits)
Examines the issue of prescription drug abuse among the general population. Graded P/N.

PHAR 716. HEALTHCARE CHALLENGES FOR PERSONS WITH DISABILITIES. (1 Credit)
Students develop an understanding of healthcare challenges faced by persons with physical and mental disabilities. Graded P/N. This course is repeatable for 2 credits.

PHAR 717. SENIOR CARE PHARMACY. (2 Credits)
Provides an overview of senior care pharmacy practice including an introduction to the senior patient, the senior care healthcare environment, medication-related problems in the elderly, the role of the pharmacist as a member of the interdisciplinary senior healthcare team, and employment opportunities in senior care pharmacy. Graded P/N.
Equivalent to: PHAR 721
Recommended: First-year standing PharmD program and PHAR 723 and PHAR 735 and PHAR 739

PHAR 718. NATURAL PRODUCT DRUG DEVELOPMENT. (2 Credits)
Overview of the process of drug development, with an emphasis on natural product sources of lead components. Top-selling and mainstay drugs will be researched in literature assignments and discussed to illustrate historical and current drug development paradigms. In addition, future approaches to drug discovery and paradigm shifts to incorporate concepts such as network pharmacology will be explored.
Equivalent to: PHAR 722
Recommended: Second-year standing in PharmD program

PHAR 719. POISONS AND TOXINS. (2 Credits)
Covers many different types of substances, including common household poisons, poisonous plants and mushrooms, toxic gases/metals, shellfish toxins, and other natural toxins. Aspects of the chemistry and pharmacology of the poisons, antidotes/treatments, and occasional case studies will be covered. Historical examples and current events will also be incorporated into the course materials.
Equivalent to: PHAR 723
Recommended: PHAR 735
PHAR 720. PHARMACY PRACTICE I: PRINCIPLES OF INTEGRATED PATIENT CARE. (4 Credits)
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations.
Recommended: First-year standing in PharmD program

PHAR 721. PHARMACY PRACTICE II. (3 Credits)
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations.
Recommended: PHAR 720

PHAR 722. PHARMACY PRACTICE III: PRINCIPLES OF INTEGRATED PATIENT CARE. (4 Credits)
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations.
Recommended: PHAR 721

PHAR 726. PRINCIPLES OF EVIDENCE-BASED MEDICINE II: DRUG LIT EVAL. (3 Credits)
Students will learn to critique and evaluate health-related scientific journal articles using valid established techniques.
Recommended: Second-year standing in PharmD program

PHAR 728. PHARMACY LAW. (2 Credits)
Introduces the student to the federal and state agencies and regulations that govern pharmacy practice and provides students with foundational knowledge and skills to comply with state and federal regulations. Emphasis will be on regulations from the Food and Drug Administration, Drug Enforcement Administration, and Oregon Board of Pharmacy.
Recommended: First year standing in PharmD program

PHAR 729. PRINCIPLES OF EVIDENCE-BASED MEDICINE I: INFORMATION SCIENCE. (3 Credits)
Students will learn to identify appropriate information resources and will systematically collect, arrange, and analyze pertinent information related to a particular patient or drug product problem.
Equivalent to: PHAR 739
Recommended: First-year standing in PharmD program

PHAR 733. PHARMACEUTICS I. (3 Credits)
Foundational perspectives in physical pharmacy with an emphasis on liquid and parenteral products. Properties and processes that influence compatibility and stability in drug formulation are discussed. Varied types of sterile and non-sterile formulations, including product optimization for drug delivery and patient specific considerations, are examined.
Recommended: PHAR 735

PHAR 734. PHARMACEUTICS II. (3 Credits)
Preformulation and formulation factors affecting the development, production and use of pharmaceutical dosage forms, including ingredients in, and physical, chemical, and biological properties affecting storage, stability, and handling of dosage forms. Lec/lab. Approved for use on a graduate program of study.
Recommended: PHAR 733 and PHAR 735

PHAR 735. FOUNDATIONS OF DRUG ACTION I. (3 Credits)
Introductory course into actions of chemicals on physiological systems. Concepts encompass drug absorption and distribution, drug design and characterization of drug interactions with specialized cellular components, drug activation of biological response via biochemical or molecular transduction mechanisms, drug-induced toxicities and drug biotransformation or excretion. Approved for use on a graduate program of study.
Equivalent to: PHAR 762
Recommended: First-year standing in PharmD program

PHAR 736. DRUG ACTION III: AUTONOMIC DRUG ACTION. (3 Credits)
Drug actions in the autonomic nervous system (ANS) provide a template for understanding drug actions throughout the body. This course provides a complete consideration of pharmacologic and medicinal chemistry principles as they relate to drug interactions with the ANS. Treatment options for selected diseases that respond to drugs acting on the ANS are also addressed.
Recommended: PHAR 735 and PHAR 737

PHAR 737. DRUG ACTION II: PHARMACOGENOMICS, PHARMACOLOGY & TOXICOLOGY. (3 Credits)
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug activation of biological response via biochemical or molecular transduction mechanisms, pharmacogenetics and pharmacogenomics, and drug-induced toxicities. Approved for use on graduate program of study.
Recommended: PHAR 735

PHAR 738. HEALTHCARE SYSTEMS I. (3 Credits)
Examination of the U.S. healthcare industry and how it relates to pharmacy. Emphasis is given to changing relationships between healthcare systems, patients, providers of care, hospitals, insurers, employers and the government.
Recommended: First-year standing in the PharmD program

PHAR 739. HEALTHCARE SYSTEMS II. (2 Credits)
Population-based strategies for improving health and wellness with an emphasis on prevention rather than treatment. We will also look at how social determinants of health affect peoples’ ability to be healthy and how the safety net seeks to close the gap for those who have limited access or resources.
Recommended: PHAR 738

PHAR 740. PHARMACY PRACTICE IV. (3 Credits)
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information.
Recommended: PHAR 722 and concurrent enrollment in PHAR 752

PHAR 741. PHARMACY PRACTICE V. (3 Credits)
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. Lec/lab.
Recommended: PHAR 740. Concurrent enrollment in PHAR 744 and PHAR 753
PHAR 742. PHARMACY PRACTICE VI. (3 Credits)
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. Lec/lab. 
Recommended: PHAR 741. Concurrent enrollment in PHAR 745 and PHAR 754

PHAR 743. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE: COMMUNITY III. (2 Credits)
Students are assigned to community, institutional and ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course. 
Recommended: Concurrent enrollment in PHAR 740

PHAR 744. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE: AMBULATORY CARE I. (2 Credits)
Students are assigned to institutional or ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course. Graded P/N.
Recommended: Concurrent enrollment in PHAR 742 and PHAR 754

PHAR 746. PHARMACY MANAGEMENT. (3 Credits)
Using a case-based format, students will work in groups to “solve” (using SOAP notes) real-world scenarios based in different pharmacy settings. The cases are organized around the major focus areas listed in the schedule. Each group will present their solution and a recap of the actual outcome will be provided whenever available.

PHAR 747. INFECTIOUS DISEASES AND TREATMENTS. (3 Credits)
Introduction to infectious disease processes and antimicrobial agents, including general clinical microbiology, and structure mechanism of action of anti-bacterial and anti-fungal agents.

PHAR 748. DRUG ACTIONS IN IMMUNOLOGY AND INFLAMMATION. (3 Credits)
Review of foundational concepts in immunology, inflammation and tissue repair; and modification of these processes therapeutically through an understanding and application of anti-inflammatory agents and immune system modulators.

PHAR 750. PHARMACOKINETICS AND BIOPHARMACEUTICS. (4 Credits)
Pharmacokinetics and bioavailability of drugs in clinical care, including changing disease states. Approved for use on a graduate program of study.
Recommended: PHAR 735

PHAR 752. INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS I. (7 Credits)
Drug therapy of central nervous system disorders; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 736

PHAR 753. INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS II. (7 Credits)
Drug therapy of pulmonary and cardiovascular disorders; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 752

PHAR 754. INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS III. (7 Credits)
Drug therapy of endocrine disorders, and men’s and women’s health issues; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 753

PHAR 760. INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: INSTITUTIONAL. (2 Credits)
Students gain familiarity with the provision of patient centered care through the variety of pharmacy services within a health system. Experiences include introduction to acute care services, transitions of care, and introduction to health systems pharmacy. Emphasis is on learning how to ensure patient medication safety by understanding the process of preparing and distributing medication, collecting and analyzing relevant patient information, and providing guidance regarding medication administration and monitoring.
This course is repeatable for 6 credits.
Recommended: Concurrent enrollment in PHAR 761 and PHAR 764

PHAR 761. ADVANCED INTEGRATED DRUG THERAPY I. (8 Credits)
Pathophysiologic basis of disease and drug therapy management.
Recommended: Concurrent enrollment in PHAR 764 and PHAR 770

PHAR 762. ADVANCED INTEGRATED DRUG THERAPY II. (8 Credits)
Pathophysiologic basis of disease and drug therapy management.
Recommended: Concurrent enrollment in PHAR 765

PHAR 763. PATHOPHYSIOLOGY AND THERAPEUTICS III. (7 Credits)
Pathophysiologic basis of disease and drug therapy management.
Equivalent to: PHAR 736
Recommended: PHAR 762. Concurrent enrollment in PHAR 766 and PHAR 774

PHAR 764. PHARMACY PRACTICE VII. (3 Credits)
Development of skills for advanced drug therapy problem identification, assessment, and plan resolution for patients with diseases discussed in PHAR 752, 753, 754, 761 and PHAR 762. Students will integrate interviewing, physical assessment, and problem-solving to identify, assess, and resolve drug therapy problems and communicate findings in SOAP notes, care plans, and case presentations.
Recommended: PHAR 742 and concurrent enrollment in PHAR 761

PHAR 765. PHARMACY PRACTICE VIII. (3 Credits)
Development of skills for application of didactic learning to case-based drug therapy problem identification, assessment, and plan. Content draws on PHAR 761, and PHAR 762, as well as earlier course work. Students will integrate knowledge from multiple courses to problem-solve drug therapy concerns, and communicate findings both orally and in written format.
Recommended: PHAR 761 and PHAR 764. Concurrent enrollment in PHAR 762
PHAR 766. PHARMACY PRACTICE IX. (3 Credits)
Development of skills for advanced drug therapy problem identification, assessment, and plan resolution for patients with diseases discussed in PHAR 761, PHAR 762, PHAR 763. Students will integrate interviewing, physical assessment, and problem-solving to identify, assess, and resolve drug therapy problems, and communicate findings in SOAP notes, care plans, and case presentations. Lec/lab/rec.
Recommended: PHAR 762 and PHAR 765. Concurrent enrollment in PHAR 760 and PHAR 763 and PHAR 772

PHAR 767. PRE-APPE READINESS AND COMPLEX CASE ANALYSIS. (3 Credits)
Confidence and competence needed for advanced practice settings are enhanced utilizing a mixture of benchmark assessment tools and small case discussions of complex patient cases. The focus is to assure readiness to integrate into inter-professional collaborative healthcare settings and serve diverse patient populations. Knowledge, skills, attitudes, and professional values are assessed and developed. Formative and summative feedback delivered through faculty, peer, and self-evaluation help guide student preparation for advanced experiences and life-long learning. Graded P/N.
Recommended: PHAR 760 and PHAR 762 and PHAR 765 and PHAR 773

PHAR 768. ETHICAL AND LEGAL DECISION MAKING. (1 Credit)
Student understanding of pharmacy law is assessed, and discussed in the context of pharmacists’ ability to properly respond when legal concepts may not align with ethical decision making in a health profession. Students will apply a framework for ethical decision making and identify personal strategies to maintain currency in pharmacy law and applied ethical decision making.
Recommended: PHAR 760 and PHAR 762 and PHAR 765 and PHAR 773

PHAR 770. ADVANCED PHARMACOKINETICS. (4 Credits)
A physiologic approach to understanding advanced pharmacokinetic principles. Approved for use on a graduate program of study.
Recommended: PHAR 750

PHAR 773. EVIDENCE BASED MEDICINE III. (3 Credits)
Covering the principles required for evidence-based medicine, including interpreting and applying results from clinical, humanistic, and economic research to medical decision-making.
Recommended: PHAR 726

PHAR 774. EVIDENCE BASED MEDICINE IV. (3 Credits)
Covers a variety of topics related to drug policy and drug use management. Population-based strategies to improve drug use will be emphasized along with developing an evidence-based process for evaluating new drugs. A major course project, evaluating a new drug, will focus on application of principles taught in this and previous courses.
Recommended: PHAR 773

PHAR 776. PHARMA-CSI. (2 Credits)
Application of PK, PD, and P’genomic concepts, principles, and equations in computer workshops to solve drug therapy misadventures. Approved for use on a graduate program of study.
Recommended: PHAR 770 and third-year standing in the PharmD program

PHAR 777. ACUTE MEDICAL EMERGENCIES. (2 Credits)
Drug therapy management in the critically ill patient. Graded P/N.
Recommended: PHAR 762

PHAR 778. ADVANCED ADULT MEDICINE. (2 Credits)
Adult medicine elective utilizes actual patient cases to enhance knowledge of pharmacy and the pharmacologic basis of therapeutics in the setting of adult medicine, emphasizing application or current guidelines and major clinical trials for commonly encountered disease states. Graded P/N.
Recommended: Third-year standing in PharmD program and PHAR 761 and PHAR 762 and PHAR 764 and PHAR 765

PHAR 780. COMMUNITY PHARMACY CLERKSHIP. (8 Credits)
Supervised advanced professional education in ambulatory care pharmacy practice environment. Emphasis is placed on the application of direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess and monitor pharmacotherapy of acute and chronic diseases in addition to providing drug information. Graded P/N.
Equivalent to: PHAR 785
This course is repeatable for 2 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 785. AMBULATORY PRIMARY CARE CLERKSHIP. (8 Credits)
Supervised advanced professional education in ambulatory care pharmacy practice environment. Emphasis is placed on the application of direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess and monitor pharmacotherapy of acute and chronic diseases in addition to providing drug information to patients and health care professionals. Graded P/N.
This course is repeatable for 32 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 790. GENERAL INTERNAL MEDICINE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in internal medicine inpatient pharmacy practice environment. Emphasis is placed on the application of biomedical and pharmaceutical sciences to direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess, and monitor pharmacotherapy involved in a wide variety of acute and chronic diseases. In addition, students will provide drug information to other health care professionals and patients. Graded P/N.
This course is repeatable for 32 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 792. HOSPITAL/HEALTH SYSTEMS PATIENT CARE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in various hospital or health care systems patient care-oriented settings. Emphasis is placed on application of pharmaceutical sciences and pharmacotherapy to patient care. Graded P/N.
This course is repeatable for 24 credits.
Recommended: Fourth-year standing in the PharmD program
PHAR 795. PATIENT CARE ELECTIVE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in various patient care-oriented settings. Emphasis is placed on the application of pharmaceutical sciences and pharmacotherapy to direct and indirect pharmaceutical care. Specialties include but are not limited to geriatrics, pediatrics, infectious disease, oncology, general patient care, nutrition support, nuclear pharmacy, home infusion, critical care, anticoagulation, pain management, etc. Graded P/N.
This course is repeatable for 24 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 797. ELECTIVE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in various pharmacy-oriented settings. Emphasis is placed on the application of pharmaceutical sciences and pharmacotherapy to a variety of environments involving pharmacy. Specialties include but are not limited to managed care, drug information, administration, pharmaceutical research, pharmaceutical industry, professional pharmacy organizations, etc. Graded P/N.
This course is repeatable for 24 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 798. PHARMACY HEALTH ADMINISTRATION. (8 Credits)
Provides students the opportunity to integrate and apply leadership and business principles necessary to operate and manage a pharmacy business or department in a diverse organizational environment.
This course is repeatable for 16 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774 and reading and understanding of the Advanced Experiential Manual

PHAR 799. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Pharmaceutical Sciences Graduate Major (MS, PhD)
Graduate Areas of Concentration
Biopharmaceutics, medicinal chemistry, natural products chemistry, pharmaceutics, pharmacoeconomics, pharmacokinetics, pharmacology, toxicology

Faculty in the department are involved foundational research that aims to identify novel chemicals and characterize the therapeutic potential of new agents from unusual microbes, plants, and other biological sources; design and develop nanoparticles for highly targeted delivery of new drug types; discover and investigate new drug targets to treat drug-resistant infections, cancer, muscle, skeletal and other diseases; and explore the impact of the human microbiome on health and disease using advanced computational methods and systems approaches.

Major Code: 4790

Pharmaceutical Sciences Graduate Minor

Minor Code: 4795

Pharmacy Professional Major (PHARMD)
The Doctor of Pharmacy degree (Pharm.D.) is a four year professional degree that prepares students for a career in pharmacy and is required for licensure as a pharmacist.

The professional program expands upon a student’s background in the biomedical sciences, to include expertise in the pharmaceutical and clinical sciences.

Students concurrently engage in a diversity of experiential opportunities, learning to apply their expertise to solve complex healthcare concerns for individuals and populations.

The Pharm.D. program provides students the opportunity to pursue a broad array of career options within the profession; ranging from traditional roles in community or institutional pharmacy to emerging roles in ambulatory care or a variety of specialties.

Major Code: 4780

Course Title Hours
First Year
First Professional Year — Corvallis campus
PHAR 001 SERVICE LEARNING 0
PHAR 707 CAREER PERSPECTIVES AND PROFESSIONAL DEVELOPMENT 2
PHAR 708 INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE I 2
PHAR 709 INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE II 2
PHAR 711 FUNDAMENTALS OF INTERPROFESSIONAL COLLABORATION 1
PHAR 714 COMPLEMENTARY MEDICINE 3
PHAR 720 PHARMACY PRACTICE I: PRINCIPLES OF INTEGRATED PATIENT CARE 4
PHAR 721 PHARMACY PRACTICE II 3
PHAR 722 PHARMACY PRACTICE III: PRINCIPLES OF INTEGRATED PATIENT CARE 4
PHAR 728 PHARMACY LAW 2
PHAR 729 PRINCIPLES OF EVIDENCE-BASED MEDICINE I: INFORMATION SCIENCE 3
PHAR 733 PHARMACEUTICS I 3
PHAR 734 PHARMACEUTICS II 3
PHAR 735 FOUNDATIONS OF DRUG ACTION I 3
PHAR 736 DRUG ACTION III: AUTONOMIC DRUG ACTION 3
PHAR 737 DRUG ACTION II: PHARMACOGENOMICS, PHARMACOLOGY & TOXICOLOGY 3
PHAR 738 HEALTHCARE SYSTEMS I 3
PHAR 739 HEALTHCARE SYSTEMS II 2
PHAR 747 INFECTIOUS DISEASES AND TREATMENTS 3
PHAR 748 DRUG ACTIONS IN IMMUNOLOGY AND INFLAMMATION 3
Approved Electives 0-4

Second Year
Second Professional Year — Corvallis campus
PHAR 002 LEADERSHIP 0
PHAR 712 FOUNDATIONS OF PATIENT SAFETY AND INTERPROFESSIONAL PRACTICE 1
PHAR 726 PRINCIPLES OF EVIDENCE-BASED MEDICINE II: DRUG LIT EVAL 3

Minor Code: 4795
A total of eight Advanced Pharmacy Practice Experiences (APPE) are required. Required APPEs include PHAR 780, PHAR 785, PHAR 790, PHAR 792, and at least two selected from the list of PHAR 795 clerkships.

Major Code: 4780
College of Public Health and Human Sciences

Lifelong health and well-being for every person, every family, every community.

123 Women’s Bldg
Oregon State University
Corvallis, OR 97331-6802
Phone: 541-737-3220
Website: http://health.oregonstate.edu/ (http://health.oregonstate.edu/students/)

Student Services
Office of Student Success
105 Women’s Building
Oregon State University
Corvallis, OR 97331-5109
Phone: 541-737-8900
Email: phhs.advising@oregonstate.edu
Website: http://health.oregonstate.edu/students/

Administration
F. Javier Nieto, Dean, javier.nieto@oregonstate.edu
Sheryl Thorburn, Associate Dean for Academic and Faculty Affairs, 541-737-9493, sheryl.thorburn (sheryl.thorburn@oregonstate.edu)@oregonstate.edu
(vicki.ebbeck@oregonstate.edu)
Marie Harvey, Associate Dean for Research, 541-737-3824, marie.harvey@oregonstate.edu
Vicki Ebbeck, Associate Dean for Student Success, 541-737-6800, vicki.ebbeck@oregonstate.edu
Roberta Riportella, Associate Dean for Outreach and Engagement, 541-737-1737, roberta.riportella (roberta.riportella@oregonstate.edu)@oregonstate.edu
(vicki.ebbeck@oregonstate.edu)
Erin Heim, Head Advisor, 541-737-8900, erin.heim@oregonstate.edu

College of Public Health and Human Sciences (PHHS)

Inspired by our mission as a leading land grant university, we create synergy in teaching, research, and outreach to develop the next generation of globally minded public health and human sciences professionals. Through interdisciplinary research and innovative curricula, we advance knowledge, policies, and practices that improve population health in communities across Oregon and beyond.

The College of Public Health and Human Sciences offers a comprehensive array of undergraduate and graduate education programs under the public health umbrella.

Our graduates are employed in a wide variety of research, education, service, management, and leadership positions in business, government, industry, education, and agencies related to health, nutrition, education, community development, and family relationships.

The college’s scholarly and creative work improves the lives of individuals, families, and communities. Reflecting the strength and diversity of our faculty and disciplines, this work includes laboratory-based investigations of nutrition and physiology.

Our outreach and engagement initiatives and programs serve individuals, families, professionals, and communities across the campus, Oregon, the nation, and the world. This outreach includes OSU Extension’s Family and Community Health program, 4-H Youth Development, active continuing education initiatives ranging from credit and noncredit courses to full degrees, and service programs that serve OSU students, faculty, staff, as well as individuals and families.

Degree Programs
Advanced degrees include the Master of Public Health (MPH), the Master of Science (MS), the Master of Athletic Training (MATRN), the Master of Adapted Physical Education (MAPE) and Doctor of Philosophy (PhD). The MS and PhD degrees are offered in units of the college. Some of our academic programs also participate in the Master of Arts Interdisciplinary Studies (MAIS) graduate degree program.

Advising
The Office of Student Success is a primary source of information for all College of Public Health and Human Sciences undergraduate students. Students receive accurate, thorough, and timely information regarding their degree requirements, academic progress, job opportunities,
and campus activities. Professional advisors are assigned to all undergraduate students in the college. Faculty members also serve a vital role to undergraduates by providing professional and career advice. Faculty members often involve students in research and professional activities that create opportunities for leadership, personal growth, and discovery.

**Internships and Practicums**

To help prepare students in the College of Public Health and Human Sciences for careers, many of the degree programs include internships and/or practicum experiences as part of their academic programs. These opportunities provide students with invaluable work experience in their field of study and may lead to postgraduate employment. Faculty members help place students and assist in the structure of these experiences. Additional information is available the PHHS website (http://health.oregonstate.edu/internships/).

**Double Degrees**

Undergraduates with majors in the College of Public Health and Human Sciences can earn a second degree in education, innovation management, international studies, or sustainability. See the College of Education, College of Business, International Programs or Department of Forest Ecosystems and Society sections of this catalog for more information.

**Scholarships**

The College of Public Health and Human Sciences offers a variety of scholarships to deserving students. Many are reserved for students in designated majors or for first-year students. A list of scholarships and application forms are available from the college's website (http://health.oregonstate.edu/students/current/undergraduate/scholarships/).

Additional scholarship information is also available at the OSU Office of Financial Aid and Scholarships.

A grade of C– or higher is required for all courses in a student’s undergraduate program of study.

- This includes all courses and associated prerequisite courses in a student’s undergraduate program of study for a major, minor or certificate as listed in the online course catalog.
- Some programs have additional grade and/or GPA criteria, which must be met in addition to this grade policy.
- Baccalaureate core courses are not subject to this policy unless they serve as courses required in or prerequisites for a student’s major, minor, or certificate.

**Effective calendar year 2017-2018 (June 2017–May 2018):**

The College of Public Health and Human Sciences does not accept third-course attempts either at the university or transferred in from other institutions to meet individual course requirements within any major effective Fall term 2014.

- Third or subsequent attempts taken prior to Fall term 2014 may be considered to meet major program of study requirements.¹

¹ The Exercise and Sport Science and Athletic Training majors stopped allowing third or subsequent course attempts effective Fall term 2013.

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**Undergraduate Programs**

**MAJORS**

- Kinesiology (p. 904)
  - Options:
    - Pre-Therapy and Allied Health (p. 905)
- Nutrition (p. 907)
  - Options:
    - Dietetics (p. 907)
    - Nutrition and Foodservice Systems (p. 908)
    - Nutrition and Health Sciences (p. 909)
    - Pre-Dietetics (p. 910)
- Human Development and Family Sciences (p. 928)
  - Options:
    - Child Development (p. 928)
    - Early Childhood
    - General Human Development and Family Sciences (p. 929)
    - Human Services (p. 930)
- Public Health (p. 931)
  - Options:
    - Health Management and Policy (p. 931)
    - Health Promotion and Health Behavior (p. 932)

**MINORS**

- Early Childhood Development and Education (p. 925)
- Environmental and Occupational Health (p. 902)
- Exercise Physiology (p. 903)
- Nutrition (p. 907)
- Health Management and Policy (p. 927)
- Human Development and Family Sciences (p. 927)
- Public Health

**CERTIFICATES**

- Gerontology (p. 925)

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**Graduate Programs**

**Majors**

- Adapted Physical Education (p. 901)
- Athletic Training (p. 902)
- Human Development and Family Studies (p. 930)
- Kinesiology (p. 903)
  - Option:
    - Adapted Physical Activity (p. 904)
- Nutrition (p. 906)
- Public Health (p. 867)
  - Options:
    - Biostatistics (p. 867)
    - Environmental and Occupational Health (p. 868)
    - Epidemiology (p. 868)
    - Global Health (p. 868)
    - Health Promotion and Health Behavior (p. 868)
    - Health Systems and Policy
Minors

- Aging Sciences (p. 924)
- Epidemiology (p. 902)
- Ergonomics (p. 903)
- Gerontology (p. 926)
- Human Development and Family Studies (p. 930)
- Kinesiology (p. 904)
- Nutrition (p. 907)
- Public Health (p. 870)

Certificates

- Health Management and Policy (p. 927)
- Public Health (p. 866)

Professional Programs

- Physical Therapy (p. 910)

Health and Human Sciences

HHS 001. SERVICE LEARNING. (0 Credits)
Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.

HHS 002. LEADERSHIP. (0 Credits)
Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

HHS 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

HHS 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 231. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness
Equivalent to: HHP 231, HHS 231H

HHS 231H. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness; HNRS – Honors Course Designator
Equivalent to: HHS 231

HHS 241. *LIFETIME FITNESS. (1 Credit)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness

HHS 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 18 credits.

HHS 440. GLOBAL NUTRITION. (3 Credits)
Examines causes and consequences of nutritional problems including malnutrition, both under- and overnutrition, that impact health, developmental capacity, and economic well-being of populations in developing societies. Explores policies, practices, and cultural approaches to improving nutritional status at the household, local and international levels.

HHS 513. INTEGRATED APPROACH TO PUBLIC HEALTH I. (6 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health. This course is the first of a two-part course sequence.

HHS 514. INTEGRATED APPROACH TO PUBLIC HEALTH II. (6 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including: evidence-based approaches to public health; public health and health care systems; planning and management to promote health; and policy in public health. This course is the second of a two part course sequence.
Prerequisites: HHS 513 with B- or better

HHS 517. CASE STUDIES IN PUBLIC HEALTH PRACTICE. (3 Credits)
Case-based learning to illustrate the complexity of public health issues and to demonstrate the need for integrated approaches for developing and implementing successful strategies in public health practice. Students will apply a wide range of knowledge and skills essential to public health practice that relate to outbreak investigation, policy analysis, regulatory decision-making, ethics, program development, program evaluation, research synthesis, screening programs, working with stakeholders, health risk communication, and disaster preparedness.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 526. LINEAR REGRESSION IN PUBLIC HEALTH. (2 Credits)
Biostatistical tools for scientific applications in public health using linear regression analysis. Confounding, effect modification, variable selection, assessing model fit, observational studies, and exploratory data analysis. Emphasis on the use of statistical packages for analyzing public health data.
Prerequisites: H 524 with B- or better
This course is repeatable for 4 credits.
HHS 527. LOGISTIC REGRESSION IN PUBLIC HEALTH. (2 Credits)
Biostatistical tools for scientific applications in public health using logistic regression analysis. Confounding, effect modification, variable selection, assessing model fit, exploratory data analysis, and observational studies. Emphasis on the use of statistical packages for analyzing public health data.
Prerequisites: H 524 with B- or better

HHS 537. EVIDENCE-BASED LEADERSHIP IN PUBLIC HEALTH. (3 Credits)
Examines how collaboration differs from working together, and offer opportunities to develop skills for successful and effective group functioning. Students will be challenged to examine personal strengths (and the strengths of others) as they relate to leadership and followership. Explores evidence-based management – identifying and using organizational and scientific data in decision making.
Prerequisites: H 536 with B- or better

HHS 540. GLOBAL NUTRITION. (3 Credits)
Examines causes and consequences of nutritional problems including malnutrition, both under- and overnutrition, that impact health, developmental capacity, and economic well-being of populations in developing societies. Explores policies, practices, and cultural approaches to improving nutritional status at the household, local and international levels.

HHS 541. PUBLIC HEALTH PERSPECTIVE ON GLOBAL FOOD SECURITY. (3 Credits)
Explore food insecurity and hunger in the U.S. and global contexts, including examination of the causes, correlates, and consequences of hunger and community, national, and international food safety nets.

HHS 550. COMMUNICATING FOR PUBLIC HEALTH POLICY IMPACT. (3 Credits)
Successful public health professionals communicate clearly and in compelling ways with non-scientific audiences. In this hands-on course, the theory and practice of effective public health communication will be explored, with a focus on advancing a public health policy. Through a selected public health policy topic, students will develop and enhance skills in planning and implementing impactful public health communications, including message development, data visualization, media interviewing, engaging through social media and presenting to policymakers. Professionals in the field, including those in legislative and media roles, will share examples of effective communication and provide constructive feedback on students’ work.

HHS 578. EVIDENCE-BASED PUBLIC HEALTH I. (3 Credits)
Evidence-based public health is the process of integrating science-based interventions with community preferences to improve the health of populations. This is the first in a two-course series and provides theoretical and practical bases to identify, implement and evaluate evidence-based research (i.e., programs, surveillance, policies). Students will develop skills to select and adapt evidence-based public health programming for a specific community and/or population.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 579. EVIDENCE-BASED PUBLIC HEALTH II. (3 Credits)
Evidence-based public health is the process of integrating science-based interventions with community preferences to improve the health of populations. This is the second in a two-course series. Applies science and adaptation frameworks learned in the first course to the development of a program plan. Provides instruction and application of program planning and program evaluation frameworks. Course learning is synthesized through the development of a grant proposal for adapted public-health program plus evaluation plan.
Prerequisites: H 575 with B- or better and HHS 578 [B-]

HHS 580. GRANT WRITING FOR PUBLIC HEALTH PRACTITIONERS. (4 Credits)
Provides an introduction to principles of grant writing, with an emphasis on grants seeking funding from national, regional, or local entities (e.g., CDC, foundations) that support research and program that aim to improve community health through health promotion. There will be a focus on grants that MPH-level practitioners seek to conduct research, enhance practice, and/or support delivery of programs within communities. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a grant proposal.
Prerequisites: H 515 with C- or better and H 575 [C-] and H 576 [C-]

HHS 584. SURVEILLANCE AND FIELD EPIDEMIOLOGY FOR PUBLIC HEALTH. (3 Credits)
A review of public health surveillance systems, and the continuum of communicable disease surveillance into field epidemiology and other responses to identified events.
Prerequisites: H 524 with B- or better or HHS 514 with B- or better

HHS 590. PUBLIC HEALTH LAW. (2 Credits)
Explores the use of law and policy tools to promote access to health and healthy living conditions. Examines the legal powers and duties of government at the federal, state, and local levels to ensure the conditions required for people to be healthy. Discussion of individual rights as limitations on the power of the government to act in furtherance of public health goals.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 597. GLOBAL HEALTH SYSTEMS. (3 Credits)
Explores key components of global health systems, using case studies of institutions, processes, and health outcomes.

HHS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Human Development and Family Sciences

HDFS 101. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 107. INTRODUCTION TO HUMAN SERVICES. (3 Credits)
An exploration of the human services profession. Emphasis on prevention and early intervention concepts and programs. Development of internship search skills, including an introduction to a wide range of human services organizations.
Equivalent to: HDFS 262

HDFS 199. SPECIAL PROJECTS. (1-16 Credits)
Special projects designed with instructor Graded P/N.
This course is repeatable for 16 credits.

HDFS 201. *CONTEMPORARY FAMILIES IN THE U.S.. (3 Credits)
An introduction to families with application to personal life. Focuses on diversity in family structure, social class, race, gender, work and other social institutions. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: FCS 201
HDFS 209. HUMAN SERVICES PRACTICUM. (4 Credits)
Field experience to learn, primarily through observation, how to apply human service strategies and skills to helping individuals and families served by professional agencies. Supervision by agency and instructor. Requires 90 hours of work on-site. Seminar introduces basic theories and skills through readings, discussion and reflective exercises.
Prerequisites: HDFS 107 with C- or better
This course is repeatable for 8 credits.

HDFS 240. HUMAN SEXUALITY. (3 Credits)
Physiological, psychological, social, and historical influences on sexuality; emphasis on developmental and relationship aspects. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

HDFS 262. INTRODUCTION TO HUMAN SERVICES. (3 Credits)
An exploration of the human services profession. Emphasis on prevention and early intervention concepts and programs. Development of internship search skills, including an introduction to a wide range of human services organizations.
Equivalent to: HDFS 107

HDFS 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 300. HUMAN SERVICES PRACTICUM. (4 Credits)
Field experience to learn, primarily through observation, how to apply human service intervention strategies and skills to helping individuals and families served by professional agencies and organizations. Supervision by agency and instructor. Requires 90 hours of work on-site. Supplementary bi-weekly seminar, readings, and reports. Graded P/N.
Prerequisites: HDFS 262 with C- or better
Equivalent to: HDFS 209
This course is repeatable for 8 credits.

HDFS 311. INFANT AND CHILD DEVELOPMENT. (4 Credits)
Research and theory on development from infancy through middle childhood. Discussion of biological, familial, and sociocultural influences. Development of skills in observing children's behavior.
Equivalent to: HDFS 211

HDFS 312. PARENTING RESEARCH AND APPLICATION. (4 Credits)
Research and theory regarding parenting and parent education, including parenting styles and practices, discipline, parent-child interactions, attachment, and the family context with an emphasis on professional implications for promoting child health and well-being.
Equivalent to: HDFS 312X

HDFS 313. ADOLESCENT DEVELOPMENT. (4 Credits)
Advanced theories and research on physical, social and psychological development during adolescence; emphasizes influences of family, peers, schools and community.

HDFS 314. ADULT DEVELOPMENT AND AGING. (4 Credits)
Advanced theories and research related to developmental changes and stability in early, middle, and late adulthood. Gender issues, personality, cognition, and adaptation.

HDFS 330. FOSTERING LEARNING IN EARLY CHILDHOOD DEVELOPMENT. (4 Credits)
Development of skills in applying theoretical approaches to observing, recording, and interpreting the behavior of young children in order to design interactions that support learning in group settings.
Prerequisites: HDFS 311 with C- or better

HDFS 331. DIRECTED EXPERIENCE IN EARLY CHILDHOOD. (3 Credits)
Placement in early childhood program to focus on guidance techniques, classroom management, and implementation of curricula, based on developmental observation, research, and theory. Supplementary weekly seminar, readings, and reports. Lab/rec. Taught on the OSU-Cascades campus only.
Prerequisites: (HDFS 311 with C- or better or HDFS 211 with C- or better) and HDFS 330 [C-]
Equivalent to: HDFS 330

HDFS 341. FAMILY STUDIES. (4 Credits)
Study of family forms, family formation, and family change over the human life course is sociohistorical, economic, political, and cultural context.

HDFS 360. CRITICAL THINKING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (4 Credits)
Explores foundations of critical thinking, especially methods for sustaining open-minded inquiry and evaluating evidence and arguments. Current controversies in human development and family policy are targets of debate.

HDFS 361. APPLIED RESEARCH METHODS. (4 Credits)
Basic research methods as they are applied in human development and family studies.

HDFS 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 400. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 401. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 402. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 403. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 405. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 408. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 410. HUMAN SERVICES INTERNSHIP. (6-12 Credits)
Field experience to apply theory and evidence-based practices to individual, family, and community problems in professional settings. Supervision by agency and instructor. Requires 300 hours of work on-site. Seminar includes reflection and constructive criticism processes. Can be taken across 2 consecutive terms (150 hours each) within the same agency. Graded P/N.
Prerequisites: HDFS 107 with C- or better and HDFS 209 [P] and HDFS 462 [C-]
This course is repeatable for 12 credits.

HDFS 430. CHILD DEVELOPMENT CENTER INTERNSHIP. (12 Credits)
Participation in a research-based model early childhood program focused on student teaching, program development and evaluation, parent education and administration. Placement to be reserved one year in advance. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: HDFS 330 with C- or better
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Equivalent to</th>
<th>Recommended Credits</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS 431</td>
<td>FAMILY, SCHOOL, AND COMMUNITY COLLABORATION.</td>
<td>3</td>
<td>Focus on family, school, community environments and interactions for children from infancy to adolescence. Resources and skills for enhancing child development across these settings are emphasized.</td>
<td></td>
<td>HDFS 436</td>
<td>3</td>
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<tr>
<td>HDFS 432</td>
<td>CHILDREN AND YOUTH WITH DISABILITIES.</td>
<td>3</td>
<td>Developmental, educational, and family issues related to children and youth with disabilities. Highlights a broad range of human exceptionality, including giftedness.</td>
<td></td>
<td>HDFS 420</td>
<td>6</td>
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<tr>
<td>HDFS 433</td>
<td>EARLY CHILDHOOD INTERNSHIP.</td>
<td>10</td>
<td>Students will complete an internship in a Pre-Kindergarten, Kindergarten or First Grade classroom and will focus on curriculum development, implementation and evaluation, individualizing for diverse student needs and communication with students.</td>
<td></td>
<td>HDFS 261</td>
<td>6</td>
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</tr>
<tr>
<td>HDFS 444</td>
<td>FAMILY VIOLENCE AND NEGLECT.</td>
<td>4</td>
<td>Examination of the causes and consequences of family abuse and neglect, including child abuse, domestic violence and elder abuse.</td>
<td></td>
<td>HDFS 446, HDFS 447H</td>
<td>6</td>
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<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY.</td>
<td>4</td>
<td>Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required.</td>
<td>(Bacc Core Course)</td>
<td>HDFS 446, HDFS 447H</td>
<td>6</td>
<td></td>
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<tr>
<td>HDFS 447H</td>
<td>*FAMILIES AND POVERTY.</td>
<td>4</td>
<td>Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required.</td>
<td>(Bacc Core Course)</td>
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<tr>
<td>HDFS 460</td>
<td>FAMILY POLICY.</td>
<td>4</td>
<td>Family policies aim to protect, promote, and strengthen families by addressing one or more of the five explicit functions families perform: (a) family formation, (b) partner relationships, (c) economic support, (d) childrearing, and (e) caregiving. This course will explore the relationships between family policies and family functioning using state, federal, and international policy examples. By reviewing theoretical frameworks for conceptualizing family policy, students will assess the consequences policies may have for family well-being.</td>
<td></td>
<td>HDFS 360 with C- or better and HDFS 361 [C-]</td>
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<tr>
<td>HDFS 461</td>
<td>*PROGRAM DEVELOPMENT AND PROPOSAL WRITING.</td>
<td>4</td>
<td>Principles of program development and evaluation applied to the development of a proposal for a human services program; analysis of needs and resources, identification of empirically-based strategies, and assessment.</td>
<td>(Writing Intensive Course)</td>
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<tr>
<td>HDFS 462</td>
<td>PROFESSIONAL HELPING SKILLS.</td>
<td>4</td>
<td>Exploration of collaborative, strengths-based methods to resolve individual, family, and community problems. Application of ethical standards to case study, with emphasis on the values of human dignity and social justice. Development of basic helping skills within an empowerment framework.</td>
<td></td>
<td>HDFS 262 with C- or better and HDFS 310 [P]</td>
<td>6</td>
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<tr>
<td>HDFS 465</td>
<td>TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES.</td>
<td>3</td>
<td>Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.</td>
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<td>HDFS 465H</td>
<td>6</td>
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<tr>
<td>HDFS 465H</td>
<td>TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES.</td>
<td>3</td>
<td>Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.</td>
<td></td>
<td>HDFS 465H</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>HDFS 471</td>
<td>RESEARCH.</td>
<td>1-6</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 18 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 472</td>
<td>INDEPENDENT STUDY.</td>
<td>1-6</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 18 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 473</td>
<td>THESIS.</td>
<td>1-16</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 18 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 499</td>
<td>SPECIAL TOPICS.</td>
<td>1-6</td>
<td>This course is repeatable for 16 credits.</td>
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<td>HDFS 499H</td>
<td>6</td>
<td></td>
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<tr>
<td>HDFS 501</td>
<td>RESEARCH.</td>
<td>1-6</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 18 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 502</td>
<td>INDEPENDENT STUDY.</td>
<td>1-6</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 18 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
<td></td>
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<tr>
<td>HDFS 503</td>
<td>THESIS.</td>
<td>1-16</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 999 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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</tr>
<tr>
<td>HDFS 505</td>
<td>READING AND CONFERENCE.</td>
<td>1-6</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 16 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
<td></td>
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<tr>
<td>HDFS 506</td>
<td>SPECIAL PROBLEMS/SPECIAL PROJECTS.</td>
<td>1-6</td>
<td>This course is repeatable for 16 credits.</td>
<td></td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 507</td>
<td>SEMINAR.</td>
<td>1-16</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 16 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 508</td>
<td>WORKSHOP.</td>
<td>1-16</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 16 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 509</td>
<td>PRACTICUM.</td>
<td>1-16</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 16 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 510</td>
<td>INTERNSHIP.</td>
<td>3-15</td>
<td>(3 Credits)</td>
<td>This course is repeatable for 16 credits.</td>
<td>HDFS 499H</td>
<td>6</td>
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<tr>
<td>HDFS 511</td>
<td>THEORIES OF HUMAN DEVELOPMENT.</td>
<td>4</td>
<td>Critical examination of significant theories of human development. Emphasizes evolution of theories and impact on current human development research.</td>
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HDFS 516. CHILD DEVELOPMENT. (4 Credits)
Study of theories, concepts, and issues related to physical, cognitive, social, and emotional development in infants and children. Covers family contexts, risk and resilience, nature/nurture issues, critical/sensitive periods, the importance of early experience, and the relationship between basic and applied research.
Recommended: 15 quarter credits of social and behavioral sciences.

HDFS 517. ADOLESCENT DEVELOPMENT. (4 Credits)
Study of theories, concepts, and issues related to biological, cognitive, social, and emotional development in adolescents. Covers identity formation, family contexts, adolescent sexuality, societal contexts for adolescent development, and risk and resilience processes.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 518. ADULT DEVELOPMENT AND AGING. (4 Credits)
Study of theories, concepts, and issues related to biological, cognitive, social, and emotional development throughout adulthood. Covers life transitions, stress-related growth, optimal aging, wisdom, and developmental methods.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 519. THE LIFE COURSE. (4 Credits)
Introduces students to key concepts, principles, and controversies in life-course studies. Emphasizes how the nature and rhythm of the life course is structured by time and place. Examines how the lives of individuals and groups are shaped by history, demography, social institutions, states and policies, and culture.

HDFS 529. INTRODUCTORY DATA ANALYSIS WITH SAS. (1 Credit)
Introduction to basic statistical concepts and the use of the SAS software for data analysis. Graded P/N.

HDFS 530. RESEARCH IN HUMAN DEVELOPMENT AND FAMILY SCIENCES I. (4 Credits)
An overview of research design, measurement, sampling and evaluation research. Introduces computer applications for data collection and analysis. Lec/lab.
Recommended: Undergraduate statistics and 12 credits of social science courses.

HDFS 531. APPLIED QUANTITATIVE METHODS I: ANOVA. (4 Credits)
Principles and application of general linear models for categorical predictors and repeated measures designs (e.g., ANOVA).
Prerequisites: HDFS 529 with B- or better

HDFS 532. APPLIED QUANTITATIVE METHODS II: LINEAR REGRESSION. (4 Credits)
Principles and application of general linear models for continuous predictors (e.g., multiple regression).
Prerequisites: HDFS 531 with B- or better
Equivalent to: HDFS 632

HDFS 533. SOCIAL POLICY AND HUMAN DEVELOPMENT. (4 Credits)
Probes how policies and governments affect human development over the life course. Examines experiences in family, education, work, and health. Families are a central lens for examining effects. Offered alternate years.
Equivalent to: HOEC 533

HDFS 534. SOCIAL PROGRAM AND POLICY EVALUATION. (4 Credits)
Models of evaluation and application of applied research methods to social programs and policies.
Prerequisites: HDFS 531 with C or better
Equivalent to: HOEC 534

HDFS 538. QUALITATIVE RESEARCH METHODS I. (4 Credits)
Critical survey of qualitative approaches in social science research. Examines historical roots, epistemological perspectives, and ethical issues. Includes ethnographic and observational methods, interview, grounded theory, case study, and participatory approaches.
Equivalent to: HDFS 635
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 539. QUALITATIVE METHODS II. (4 Credits)
Critical survey of qualitative approaches in social science research. Examines historical roots, epistemological perspectives, and ethical issues. Includes ethnographic and observational methods, interview, grounded theory, case study, and participatory approaches. Application of qualitative methods through completion of a qualitative research project.
Prerequisites: HDFS 538 with C or better

HDFS 541. FAMILY STUDIES. (4 Credits)
Critical survey of current research in family studies with a focus on diverse family structures and processes.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 546. THEORIES OF FAMILY STUDIES. (4 Credits)
An overview of the major theoretical perspectives used in the study of families. Issues of theory construction and evaluation are also covered. Course goal is to enable the student to apply conceptual frameworks to a particular area of interest.
Equivalent to: HDFS 547

HDFS 547. FAMILIES AND POVERTY. (3 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families.
Equivalent to: HDFS 546

HDFS 555. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY.

HDFS 587. SOCIAL GERONTOLOGY. (3 Credits)
An introduction to aging research targeted toward understanding demographics of aging societies, lifespan theories, methods of aging research, psychosocial aging processes, family and caregiving issues, housing and long-term care, and current social policies.

HDFS 601. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 602. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

HDFS 605. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 606. SPECIAL PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
HDFS 610. PRACTICUM/INTERNSHIP. (3-15 Credits)
This course is repeatable for 16 credits.

HDFS 616. ADVANCED TOPICS IN CHILD-adolescent DEVELOPMENT. (3 Credits)
Advanced critical study of theory and research related to specific topics of social, emotional, and cognitive development during infancy, childhood and/or adolescence.
This course is repeatable for 6 credits.

HDFS 617. ADVANCED TOPICS IN ADULT DEVELOPMENT AND AGING. (3 Credits)
Advanced critical study of theory and research related to specific topics of social and emotional development and stability in adulthood, including later life.
This course is repeatable for 9 credits.

HDFS 630. QUANTITATIVE METHODS IN FAMILY AND INDIVIDUAL DEVELOPMENT. (3 Credits)
Advanced quantitative techniques in human development and family studies. Includes longitudinal designs, structural equation modes.
Content varies with each offering.
Prerequisites: HDFS 532 with B- or better
This course is repeatable for 9 credits.

HDFS 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotions.
Recommended: 9 credits of public health or HDFS graduate coursework

HDFS 665. TEACHING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (1 Credit)
Principles and practices of pedagogy in human development and family sciences related to both on-campus and Ecampus instruction. Graded P/N.
This course is repeatable for 6 credits.

HDFS 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging of African-American, Latino, and Asian-Pacific Islander elderly. Taught spring
Equivalent to: EXSS 685
This course is repeatable for 16 credits.

KIN 131. INTRODUCTION TO KINESIOLOGY. (1 Credit)
Overview of the field; career opportunities in exercise and sport science and other professions dealing with the discipline of human movement; orientation to support services. Graded P/N.
Equivalent to: EXSS 131

KIN 132. INTRODUCTION TO THE ALLIED HEALTH PROFESSIONS. (1 Credit)
Overview of allied health professions including physical and occupational therapy, physician assistant, nursing, athletic training and others. Discuss job responsibilities, employment opportunities and educational requirements.
Equivalent to: EXSS 132

KIN 160. INTRODUCTION TO INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE. (3 Credits)
Introduction to management of physical activity-related injury for the non-healthcare provider (e.g., coaches, physical educators and fitness professionals).
Equivalent to: EXSS 160

KIN 194. PROFESSIONAL ACTIVITIES. (1-2 Credits)
Basic movement skills, basic rhythms, track and field.
Equivalent to: EXSS 194

KIN 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: EXSS 199
This course is repeatable for 16 credits.

KIN 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 230. INTRODUCTION TO ADVENTURE PROGRAMS. (3 Credits)
Foundation course for leadership opportunities in the Adventure Leadership Institute (ALI). Provides overview of history, theoretical foundations, and utilization of adventure programs in education, recreation, and therapy.
Equivalent to: EXSS 230

KIN 231. HUMAN GROUP DYNAMICS. (3 Credits)
Provides students with the fundamental concepts and theories essential for understanding dynamics that occur in groups in recreation, leisure, and everyday settings.
Equivalent to: EXSS 231

KIN 232. BACKCOUNTRY LEADERSHIP. (3 Credits)
Prepares students to be leaders in outdoor settings by building the practical and logistical skills needed in the effective delivery of courses and/or trips. Covers the teaching skills and essentials for trip leaders in the wilderness, including trip planning, logistics, risk management, and group interaction in the backcountry.
Prerequisites: (EXSS 230 with C or better or KIN 230 with C or better) and PAC 301 [C] and PAC 303 [C] and PAC 329 [C]
Equivalent to: EXSS 232

KIN 233. TEACHING TECHNIQUES FOR OUTDOOR ACTIVITIES. (3 Credits)
Gateway course for students pursuing the Level Three Adventure Leadership Certificate. Emphasizes teaching outdoor activities at a professional level. Students work individually with the course instructor to develop, plan and implement an activity course (land or water based) for the Adventure Leadership Institute.
Prerequisites: EXSS 232 with C or better or KIN 232 with C or better
Equivalent to: EXSS 233

KIN 299. SPECIAL TOPICS. (1-3 Credits)
Equivalent to: EXSS 299
This course is repeatable for 24 credits.

KIN 301. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 301
This course is repeatable for 16 credits.
KIN 305. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 305
This course is repeatable for 16 credits.

KIN 306. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 306
This course is repeatable for 36 credits.

KIN 307. SEMINAR. (1-3 Credits)
Section 2: Seminar Pre-Internship (1 credit).
Equivalent to: EXSS 307
This course is repeatable for 36 credits.

KIN 311. MOTOR BEHAVIOR. (4 Credits)
Underlying mechanisms and factors affecting movement function, skill acquisition, and changes in movement behavior across the lifespan.
Prerequisites: BI 232 with C- or better or BI 332 with C- or better
Equivalent to: EXSS 311

KIN 312. *SOCIOCULTURAL DIMENSIONS OF PHYSICAL ACTIVITY. (4 Credits)
Physical activity in contemporary society. Relationships with the social processes; interrelationships between physical activity and cultural institutions. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture
Equivalent to: EXSS 312
Recommended: Social processes course

KIN 314. INTRODUCTION TO ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Overview of cognitive, neuromuscular, sensory and orthopedic disabilities; understanding accessible physical activity programs for individuals with disabilities.
Equivalent to: EXSS 314

KIN 321. BIOMECHANICS OF HUMAN MOVEMENT. (4 Credits)
Integration of the physical laws and anatomical structures governing human movement; qualitative analytical processes emphasized.
Prerequisites: (BI 231 with C- or better and BI 241 [C-]) or (BI 331 [C-] and BI 341 [C-]) and (MTH 112 [C-] or MTH 251 [C-])
Equivalent to: EXSS 321

KIN 324. EXERCISE PHYSIOLOGY. (4 Credits)
Physiological effects of acute and chronic exercise; factors affecting human performance; exercise training principles.
Prerequisites: (BI 233 with C- or better or BI 333 with C- or better) and (BI 231 [C-] or BI 331 [C-] and (CH 121 [C-] or CH 231 [C-] or CH 231H [C-]) and (CH 122 [C-] or CH 232 [C-] or CH 232H [C-]) and (CH 123 [C-] or CH 233 [C-] or CH 233H [C-] or CH 130 [C-])
Equivalent to: EXSS 324

KIN 325. FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION. (3 Credits)
Introduction to lab- and field-based physical fitness assessments and the skills needed to design safe and effective exercise programs for apparently healthy adults. Lec/lab.
Prerequisites: KIN 324 with C- or better or EXSS 324 with C- or better
Equivalent to: EXSS 325

KIN 333. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Equivalent to: EXSS 333

KIN 334. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Prerequisites: KIN 333 with C- or better
Equivalent to: EXSS 334

KIN 335. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Equivalent to: EXSS 335

KIN 341. NUTRITION FOR EXERCISE. (3 Credits)
Review of the interrelationship between nutrition and exercise, including macronutrient, micronutrient and fluid needs for active individuals.
CROSSLISTED as KIN 341/NUTR 341.
Prerequisites: KIN 324 with C- or better and NUTR 240 [C-]
Equivalent to: EXSS 341, NUTR 341

KIN 343. PRE-THERAPY/ALLIED HEALTH SEMINAR. (1 Credit)
Provides knowledge in professional school preparation and current issues related to the allied health professions.
Prerequisites: (KIN 132 with C or better or BI 109 with C or better) and BI 231 [C] and BI 232 [C] and BI 233 [C] and BI 241 [C] and BI 242 [C] and BI 243 [C]
Equivalent to: EXSS 343
Recommended: Overall GPA of 3.0

KIN 344. PRE-THERAPY/ALLIED HEALTH PRACTICUM. (1 Credit)
Clinical field experiences under the supervision of a licensed professional in the allied health or related setting enhanced with classroom discussion.
Prerequisites: KIN 132 with C or better and BI 231 [C] and BI 232 [C] and BI 233 [C] and BI 241 [C] and BI 242 [C] and BI 243 [C]
Corequisites: KIN 343
Equivalent to: EXSS 344
This course is repeatable for 2 credits.
Recommended: Overall GPA of 3.0

KIN 345. ALLIED HEALTH PRACTICUM. (1-2 Credits)
Field experience under professional supervision in an allied health or related setting. Includes arranged consultations with the instructor to discuss current issues related to the allied health professions.
Equivalent to: EXSS 345
This course is repeatable for 2 credits.
Recommended: Overall GPA 2.75

KIN 353. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 353
Recommended: OSU GPA 2.00, KIN GPA 2.50, and completion or concurrent enrollment in KIN 422 or KIN 423

KIN 354. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 354
Recommended: OSU GPA 2.00, KIN GPA 2.50 and concurrent enrollment in KIN 422 or KIN 423

KIN 355. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 355
Recommended: OSU GPA 2.00, KIN GPA 2.50 and concurrent enrollment in KIN 422 or KIN 423
KIN 360. INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE. (3 Credits)
Introduction to management of physical activity-related injury for the non-healthcare provider (e.g., coaches, physical educators and fitness professionals) and pre-professional.
Equivalent to: EXSS 360

KIN 370. PSYCHOLOGY OF SPORT AND PHYSICAL ACTIVITY. (3 Credits)
Interaction between psychological variables and human motor performance.
Equivalent to: EXSS 370

KIN 380. THERAPEUTIC MODALITIES. (4 Credits)
Indications, contraindication, techniques, and effects of various physical agents used in the care and treatment of musculoskeletal injuries and diseases.
Equivalent to: EXSS 380

KIN 385. THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise; rehabilitative activities and programs for musculoskeletal injuries, conditions, and diseases. Lec/lab.
Prerequisites: KIN 321 with C- or better or EXSS 321 with C- or better
Equivalent to: EXSS 385

KIN 394. PROFESSIONAL ACTIVITIES: RESISTANCE TRAINING PROGRAM DESIGN. (3 Credits)
Presents the conceptual basis for optimizing resistance training program designs, exercise routines for all ages and fitness levels, correct exercise technique. Lec/lab.
Prerequisites: KIN 324 with C- or better and KIN 325 [C-]
Equivalent to: EXSS 394

KIN 395. PROFESSIONAL ACTIVITIES: GROUP FITNESS. (3 Credits)
Application of biomechanical, physiological, psychological and safety principles for the development of group exercise classes in a variety of modes and settings. Lec/lab.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better) and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 395

KIN 396. PROFESSIONAL ACTIVITIES: AQUATICS. (3 Credits)
Aquatic overview; emphasis on underlying hydrodynamic principles; includes safety, survival, stroke mechanics, aquatic exercise, training, games. Lec/lab/activity.
Equivalent to: EXSS 396
Recommended: PAC 250

KIN 399. SPECIAL TOPICS. (1-3 Credits)
Equivalent to: EXSS 399, KIN 399H
This course is repeatable for 18 credits.

KIN 399H. SPECIAL TOPICS. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: KIN 399
This course is repeatable for 18 credits.

KIN 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 401
This course is repeatable for 16 credits.

KIN 403. THESIS. (1-16 Credits)
Equivalent to: EXSS 403
This course is repeatable for 16 credits.

KIN 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 405
This course is repeatable for 16 credits.

KIN 406. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 406
This course is repeatable for 16 credits.

KIN 407. SEMINAR. (1-16 Credits)
Equivalent to: EXSS 407
This course is repeatable for 16 credits.

KIN 408. WORKSHOP. (1-16 Credits)
Equivalent to: EXSS 408
This course is repeatable for 16 credits.

KIN 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 410. INTERNSHIP. (1-15 Credits)
Planned experiences at selected cooperating agencies, companies or institutions; supervised by university and - program personnel; supplementary conference, reports and appraisal required.
Equivalent to: EXSS 410
This course is repeatable for 20 credits.
Recommended: Completion of required courses, cumulative Kinesiology program GPA of 2.25, KIN overall GPA of 2.50 and completion of 165 credits

KIN 411. NEUROMUSCULAR CONTROL OF HUMAN MOVEMENT. (3 Credits)
Exploration and understanding of the neurological basis of human movement with emphasis on models of motor function and dysfunction.
Prerequisites: KIN 311 with C- or better

KIN 422. FACILITATING PHYSICAL ACTIVITY FOR CHILDREN AND YOUTH. (3 Credits)
Students learn skills for facilitating physical activity programs for children and youth in a variety of settings, including information on the benefits of physical activity, program design, implementation and management techniques.
Prerequisites: KIN 311 with C- or better or EXSS 311 with C- or better
Equivalent to: EXSS 422

KIN 423. QUALITATIVE MOVEMENT ANALYSIS. (3 Credits)
Develop observational skills to perform systematic qualitative analyses of selected physical activity performances and other human movements.
Prerequisites: (KIN 311 with C- or better or EXSS 311 with C- or better) and (KIN 321 [C-) or EXSS 321 [C-])
Equivalent to: EXSS 423

KIN 425. ANATOMICAL KINESIOLOGY. (4 Credits)
Anatomical aspects of human movement; actions of bones and muscles in motor activities. Application of physical principles to factors governing anatomical function in health and injury.
Prerequisites: EXSS 321 with C- or better or KIN 321 with C- or better
Equivalent to: EXSS 425

KIN 432. PHYSICAL ACTIVITY ASSESSMENT. (3 Credits)
Assessment of physical activity using subjective and objective measurement methods with focus on applications for individuals, communities, and special populations.
Equivalent to: EXSS 432

KIN 434. APPLIED MUSCLE PHYSIOLOGY. (3 Credits)
Skeletal muscle structure, function, and metabolism; applications to muscle fatigue, exercise training, inactivity, and aging.
Prerequisites: KIN 324 with C- or better or EXSS 324 with C- or better
Equivalent to: EXSS 434
KIN 435. PHYSICAL ACTIVITY PROMOTION. (3 Credits)
Application of behavioral science and public health research to the
promotion of physical activity in individuals, groups and communities.
Prerequisites: KIN 370 with C- or better
Equivalent to: EXSS 435

KIN 437. PHYSICAL ACTIVITY, AGING, AND CHRONIC DISEASE. (4 Credits)
Addresses the consequences of primary and secondary aging from
an individual and public health perspective. Physiological changes
associated with aging and chronic disease, functional assessment of
older adults, and exercise prescription for older adults with and without
chronic exercise will be emphasized.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better)
and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 437

KIN 444. ADVANCED ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Discuss various disability models and perspectives; reinforce
determinants of physical activity; design and implement different
physical activity programs and curricula for individuals with disabilities.
Prerequisites: (KIN 314 with C- or better or EXSS 314 with C- or better)
Equivalent to: EXSS 444

KIN 462. BEHAVIORAL DIMENSIONS OF PHYSICAL ACTIVITY. (4 Credits)
Adopting and maintaining an active, healthy lifestyle is difficult. This
course explores ‘why’ this might be the case and ‘how’ to improve upon
the situation.
Prerequisites: KIN 312 with C- or better and KIN 370 [C-]

KIN 474. EXERCISE PHYSIOLOGY LAB METHODS. (3 Credits)
Practical experience and projects in exercise physiology lab
methods, including measurement of submaximal and maximal
oxygen consumption body composition, anaerobic power, and
electrocardiography.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better)
and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 474

KIN 475. *POWER AND PRIVILEGE IN SPORT. (3 Credits)
Issues of power and privilege in sport including race, gender, sexual
orientation, disability and aggression and the consequences of long held
society norms and stereotypes. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: (KIN 312 with C- or better or EXSS 312 with C- or better)
Equivalent to: EXSS 475
Recommended: 6 credits of social science

KIN 481. *ANALYSIS OF CRITICAL ISSUES IN KINESIOLOGY. (3 Credits)
Reading and interpreting current research, and using writing as a tool for
learning on a critical issue in kinesiology. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: KIN 381

KIN 483. TISSUE INJURY AND REPAIR. (3 Credits)
Mechanics of tissue injury and the body’s response and repair following
injury of bone, muscle, tendon, ligament, cartilage and nervous system
tissue.
Prerequisites: (BI 231 with C- or better or BI 331 with C- or better) and
(BI 241 [C-] or BI 341 [C-]) and (BI 232 [C-] or BI 332 [C-]) and (BI 242 [C-] or
BI 342 [C-]) and (BI 233 [C-] or BI 333 [C-]) and (BI 243 [C-] or BI 343 [C-]) or
((Z 331 [C-] and Z 332 [C-] and Z 333 [C-] and Z 341 [C-] and Z 342 [C-] and
Z 343 [C-]))
Equivalent to: EXSS 483

KIN 490. SCIENTIFIC INQUIRY IN KINESIOLOGY. (4 Credits)
Principles and techniques of organization, administration, interpretation
and evaluation of exercise science-related data. Includes human subjects
training and certification, research design, and statistical analysis using
SPSS and Excel including central tendency, correlation and regression,
probability, and inferential statistics (t-tests and ANOVA). Lec/lab.
Prerequisites: KIN 325 with C- or better and MTH 112 [C-]

KIN 499. SELECTED TOPICS. (1-5 Credits)
Impact of human movement development on people, their movement
behavior, and environment. Topics vary from term to term and year to
year. May be repeated for credit when topics differ.
Equivalent to: EXSS 499
This course is repeatable for 24 credits.

KIN 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 501
This course is repeatable for 16 credits.

KIN 503. THESIS. (1-16 Credits)
Equivalent to: EXSS 503
This course is repeatable for 999 credits.

KIN 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 505
This course is repeatable for 16 credits.

KIN 506. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 506
This course is repeatable for 16 credits.

KIN 507. SEMINAR. (1-16 Credits)
Section 1: Seminar (1). Graduate research seminar that emphasizes
student oral presentations of current research topics in exercise and
sport science. One credit required for all graduate students. Section 2:
Current Developments (1). Discussion of contemporary issues in the
exercise and sport science literature. Topics vary by term. Two credits
required of all doctoral students. Section 9: International Aspects (1).
Discussion of international aspects of study in exercise and sport
science. Required of all doctoral students. Graded P/N.
Equivalent to: EXSS 507
This course is repeatable for 16 credits.

KIN 508. WORKSHOP. (1-16 Credits)
Equivalent to: EXSS 508
This course is repeatable for 16 credits.

KIN 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 35 credits.

KIN 510. INTERNSHIP. (1-16 Credits)
Planned experiences at selected cooperating agencies, companies
or institutions; supervised by university and program personnel;
supplementary conference, reports and appraisal required.
Equivalent to: EXSS 510
This course is repeatable for 26 credits.

KIN 511. INTRODUCTION TO ATHLETIC TRAINING. (4 Credits)
Practice domains include injury and illness prevention and wellness
protection, clinical evaluation and diagnosis, immediate and emergency
care, treatment and rehabilitation, and organizational and professional
health and well-being. Lec/lab.
KIN 512. APPLIED MOTOR LEARNING. (3 Credits)
Application of research and theory to the teaching of motor skills with emphasis on development of instructional strategies related to modeling, knowledge of results, practice, and motivational aspects of learning.
Equivalent to: EXSS 512
Recommended: KIN 311

KIN 513. MOTOR DEVELOPMENT: AN INTEGRATIVE APPROACH. (3 Credits)
Addresses the social, cultural, biological and psychological processes and health-related factors (e.g., physical activity) that jointly influence lifespan motor development (emphasis on the early years).

KIN 515. MOTOR CONTROL AND MOVEMENT DYSFUNCTION. (3 Credits)
Contemporary motor control theories and their application to the development of instructional and training programs for individuals with movement disorders caused by neurological disease and/or trauma.
Equivalent to: EXSS 515
Recommended: KIN 311 and (KIN 314 or KIN 444)

KIN 520. ORTHOPEDIC ASSESSMENT OF UPPER EXTREMITIES INJURIES. (4 Credits)
Prevention, assessment and management of upper extremity injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 511 with C or better

KIN 521. ORTHOPEDIC ASSESSMENT OF LOWER EXTREMITIES INJURIES. (4 Credits)
Prevention, assessment and management of lower extremity injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 511 with C or better

KIN 522. ORTHOPEDIC ASSESSMENT OF SPINE. (4 Credits)
Prevention, assessment and management of spinal injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 520 with C or better and KIN 521 [C]

KIN 523. BIOMECHANICS OF MOTOR ACTIVITIES. (3 Credits)
Kinematic and kinetic analysis of volitional human movement with emphasis on analytical techniques and quantitative problem solving.
Equivalent to: EXSS 523
Recommended: KIN 323 or PH 201

KIN 525. BIOMECHANICS OF MUSCULOSKELETAL INJURY. (3 Credits)
Mechanical causes and effects of forces applied to the musculoskeletal system, material properties of human tissues, pathomechanics of injury, and degenerative changes across the lifespan. Not offered every year.
Equivalent to: EXSS 525

KIN 531. PHYSIOLOGY OF PHYSICAL ACTIVITY AND INACTIVITY. (3 Credits)
Physiologic responses to acute and chronic physical activity and inactivity with emphasis on underlying mechanisms and health outcomes.

KIN 532. PHYSICAL ACTIVITY ASSESSMENT. (3 Credits)
Assessment of physical activity using subjective and objective measurement methods with focus on applications for individuals, communities, and special populations.
Equivalent to: EXSS 532

KIN 533. ENERGETICS AND BIOCHEMISTRY OF EXERCISE. (3 Credits)
Metabolic and energetic responses to acute and chronic physical activity; emphasis on recent research.
Equivalent to: EXSS 533
Recommended: Undergraduate course in biochemistry or exercise physiology.

KIN 535. PHYSICAL ACTIVITY PROMOTION. (3 Credits)
Application of behavioral science and public health research to the promotion of physical activity in individuals, groups and communities.
Recommended: KIN 370

KIN 536. PHYSICAL ACTIVITY IN DIVERSE POPULATIONS. (3 Credits)
Addresses the social, cultural, political, and environmental determinants of physical activity and health among diverse populations. Includes examination of intersecting issues related to race, ethnicity, gender, age, disability, geography, income status, and other societal factors across the lifespan for promoting physical activity through public health strategies.

KIN 544. ADVANCED ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Discuss various disability models and perspectives; reinforce determinants of physical activity; design and implement different physical activity programs and curricula for individuals with disabilities. Lec/lab.
Equivalent to: EXSS 544
Recommended: KIN 314

KIN 547. INCLUSION IN PHYSICAL ACTIVITY. (3 Credits)
Effectiveness of physical activity programs provided in inclusive settings. This will include a lifespan/non-categorical approach to program development.
Equivalent to: EXSS 547
Recommended: KIN 314 or KIN 444

KIN 548. ASSESSMENT AND PROGRAMMING FOR SPECIAL POPULATIONS. (3 Credits)
Use of appropriate assessment procedures for developing effective psychomotor programs for the disabled.
Equivalent to: EXSS 548
Recommended: KIN 314 or KIN 444

KIN 549. PHYSICAL ACTIVITY FOR PERSONS WITH SEVERE DISABILITIES. (3 Credits)
Plan, develop and implement appropriate physical activity programs, functional program design, assistive technology, instructional strategies, behavior management practices, and data analysis systems that address the needs for psychomotor performance of persons with low incidence disabilities.
Equivalent to: EXSS 549
Recommended: KIN 314 or KIN 444

KIN 550. HEALTH PROMOTION FOR PEOPLE WITH DISABILITIES. (3 Credits)
Discussion will focus on disability and health, theory driving health promotion program development, guidelines for developing a program for individuals with disabilities, and program evaluation.
Equivalent to: EXSS 550

KIN 551. CURRENT TRENDS AND ISSUES IN PHYSICAL EDUCATION. (4 Credits)
Current trends and issues in physical education, including curriculum development, professional ethics, instructional practices, and physical activity for the school community.
Equivalent to: EXSS 551

KIN 553. INSTRUCTIONAL ANALYSIS TECHNIQUES I. (3 Credits)
Introduction to techniques of instructional analysis. Provides in-depth information and training in systematic observation techniques, raw data conversion and inter/intraobserver reliability.
Equivalent to: EXSS 553
KIN 554. INSTRUCTIONAL ANALYSIS TECHNIQUES II. (3 Credits)
Laboratory/seminar experience to accompany student teaching winter and spring terms. Provides continued application of systematic observation techniques throughout the elementary student teaching experience.
Equivalent to: EXSS 554

KIN 555. SKILL ANALYSIS AND ASSESSMENT IN K-12. (3 Credits)
Develop proficiency in assessing movement skills, execution of sport techniques, and game play performance. Assessment trends and practices utilized in physical education programs are included.
Equivalent to: EXSS 555

KIN 556. INSTRUCTIONAL SKILLS I. (3 Credits)
Skills of planning, implementing, and evaluating programs of instruction in physical education, grades K-12.
Equivalent to: EXSS 556

KIN 557. INSTRUCTIONAL SKILLS II. (2 Credits)
Applying and refining skills of planning, implementing, and evaluating programs of instruction in physical education, grades K-12.
Equivalent to: EXSS 557

KIN 558. PHYSICAL EDUCATION CURRICULUM DESIGN AND ORGANIZATION. (3 Credits)
Curricular programs and variations from kindergarten through grade 12, administrative policies and practices.
Equivalent to: EXSS 558

KIN 559. THE PHYSICAL EDUCATOR AS A PROFESSIONAL. (1 Credit)
Transitioning to teaching, developing a portfolio, certification, obtaining a position, teacher burnout, professionalism, problems of first-year teachers, developing patterns of behavior that lead to a successful career.
Equivalent to: EXSS 559

KIN 560. MOTIVATION IN PHYSICAL ACTIVITY. (3 Credits)
A social psychological approach to understanding the role of self-perceptions and cognitions in explaining motivated behavior in sport and exercise settings.
Equivalent to: EXSS 560
Recommended: KIN 370

KIN 561. PSYCHOSOCIAL FACTORS IN PHYSICAL ACTIVITY. (3 Credits)
A social psychological approach to understanding the role of social interactions and contextual factors in explaining human behavior in sport and exercise settings.
Equivalent to: EXSS 561
Recommended: KIN 560

KIN 562. LIFESPAN SPORT AND EXERCISE PSYCHOLOGY. (3 Credits)
Social-psychological issues across the lifespan in the context of sport and exercise.
Equivalent to: EXSS 562
Recommended: KIN 561

KIN 564. PROGRAM CAPSTONE AND SYNTHESIS. (3 Credits)
Capstone course in which teacher candidates will review and update their teaching philosophy; showcase their Physical Education master's portfolio; and develop a plan for professional development.
Prerequisites: KIN 510 with C or better

KIN 565. EMERGENCY MANAGEMENT OF SPORTS TRAUMA. (3 Credits)
Knowledge and skills related to the specialized care required for serious and/or life-threatening acute athletic related injuries and illnesses. Lec/lab.
Prerequisites: KIN 566 with C or better

KIN 566. GENERAL MEDICAL ASSESSMENT. (4 Credits)
Prevention, evaluation, diagnosis, and management of general medical conditions commonly encountered by the athletic trainer.
Prerequisites: KIN 565 with C or better

KIN 567. PHARMACOLOGY IN ATHLETIC TRAINING. (3 Credits)
Pharmacology in sports medicine, topics including, but not limited to, the mechanisms and actions of drugs commonly administered and prescribed in sports medicine environments.
Prerequisites: KIN 566 with C or better

KIN 568. ATHLETIC TRAINING PROGRAM MANAGEMENT. (3 Credits)
Administrative aspects of athletic training program management. Including principles of risk management, strategic and operational planning, medical-legal aspects of athletic healthcare, confidentiality and documentation of patient health information, insurance and third-party reimbursement, personnel issues, and current professional issues.
Prerequisites: KIN 522 with C or better

KIN 569. EVIDENCE-BASED PRACTICE. (3 Credits)
Principles and skills underlying the utilization of evidence to enhance clinical practice decision-making. Includes the development of clinical questions, review and appraisal of relevant literature, and utilization of patient-centered outcome measures.
Prerequisites: KIN 521 with C or better

KIN 573. MEASUREMENT IN HUMAN MOVEMENT. (3 Credits)
Equivalent to: EXSS 573
Recommended: ST 511

KIN 575. RESEARCH IN HUMAN MOVEMENT. (3 Credits)
Investigation and evaluation of research methods applicable to human movement study and professional physical education.
Equivalent to: EXSS 575
Recommended: ST 511

KIN 584. PHYSIOLOGY AND MANAGEMENT OF MUSCULOSKELETAL INJURIES. (3 Credits)
Mechanics of musculoskeletal tissue injuries; physiologic response and repair processes of various tissues; and effects of physical agents commonly used by athletic trainers in the care and treatment of musculoskeletal injuries.
Prerequisites: KIN 511 with C or better

KIN 585. UPPER EXTREMITY THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise and manual therapy for the upper extremity, cervical spine, and thoracic spine. Lec/lab.
Prerequisites: KIN 586 with C or better

KIN 586. LOWER EXTREMITY THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise and manual therapy with a focus on the lower extremity, lumbar spine and ribs.
Prerequisites: KIN 584 with C or better

KIN 599. SPECIAL TOPICS. (1-3 Credits)
Impact of human movement development on people, their movement behavior, and environment. Topics vary from term to term and year to year. May be repeated when topics differ.
Equivalent to: EXSS 599
This course is repeatable for 99 credits.

KIN 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 601
This course is repeatable for 16 credits.
KIN 603. THESIS. (1-16 Credits)
Equivalent to: EXSS 603
This course is repeatable for 999 credits.

KIN 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 605
This course is repeatable for 16 credits.

KIN 606. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 606
This course is repeatable for 16 credits.

KIN 607. SEMINAR. (1-16 Credits)
Section 1: Graduate Research (1). Seminar emphasizes student oral presentations of current research topics in exercise and sport science. One credit required of all graduate students. Section 3: Current Developments (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. Two credits required of all doctoral students. Section 9: International Aspects (1). Discussion of international aspects of study in exercise and sport science. Required of all doctoral students. Graded P/N.
Equivalent to: EXSS 607
This course is repeatable for 16 credits.

KIN 610. PROFESSIONAL INTERNSHIP: PHYSICAL EDUCATION. (1-15 Credits)
Field experience in which the term will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples.
Equivalent to: EXSS 610
This course is repeatable for 25 credits.

KIN 647. CURRENT TOPICS AND RESEARCH IN ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Current trends and critical research issues in adapted physical activity; focus on international and national trends. Topic will be variable.
Equivalent to: EXSS 647

KIN 699. SPECIAL TOPICS. (1-16 Credits)
Current issues, trends, and topics in KIN research. May be repeated for credit with different topics.
Equivalent to: EXSS 699
This course is repeatable for 25 credits.

Nursing

NUR 411. INFORMATICS IN NURSING. (1 Credit)
Provides an overview of nursing informatics as a means to improve information management in healthcare. Consideration of healthcare technologies with ethical and financial criteria in relation to the quality of their outcomes.

NUR 412. TRANSITION TO PROFESSIONAL NURSING. (3 Credits)
Provides an overview of the nursing metaparadigm: client, nurse, health/illness and environment. Nursing theoretical perspectives will be discussed as a foundation for professional nursing practice as care provider and manager of care. Special emphasis will be on the practice of the baccalaureate nurse.

NUR 413. ADVANCED HEALTH ASSESSMENT. (3 Credits)
Builds on previous health assessment knowledge and skills, focusing on comprehensive health assessment skills. Using a lifespan approach, students examine the physical, cultural, psychosocial, spiritual and nutritional variables through the use of health history and health assessment.

NUR 414. NURSING EPIDEMIOLOGY. (3 Credits)
Presents the basic concepts and methods of epidemiology applied to population focused health care and nursing practice. Emphasis is placed on the use of epidemiologic reasoning in deriving inferences about the etiology of health outcomes from population data and in guiding the design of health service programs.
Prerequisites: ST 201 with D- or better

NUR 415. NURSING PRACTICE IN A MULTICULTURAL SOCIETY. (3 Credits)
Provides an overview of the influence of culture on health care practices and the delivery of nursing care for individuals, groups, and communities. Emphasis is on increasing awareness of culturally diverse nursing care and the impact of cultural beliefs, values, and practices upon health and health care delivery.
Attributes: CPCD – Core, Pers, Cult Diversity

NUR 416. POPULATION-FOCUSED AND COMMUNITY-BASED NURSING PRACTICE I. (4 Credits)
Introduces the concepts and principles of community health and the practice of evidence-based community health nursing. The nursing process is applied to the care of individuals, families, and groups within the community. Emphasis on health promotion and illness prevention. Consideration of cultural competence in nursing care. Application of community health nursing principles occurs in the 54-hour independent clinical practicum under the supervision of the faculty.
Prerequisites: NUR 413 with C- or better
Recommended: Completion of at least 12 credits in the RN to BSN program

NUR 417. POPULATION-FOCUSED AND COMMUNITY-BASED NURSING PRACTICE II. (5 Credits)
Builds on NUR 416 through the application of the theories and principles of population-focused nursing in a community setting. Emphasis will be on community health measures which promote and maintain the health of the community. Application of community health nursing principles occurs in the 54-hour independent clinical practicum under the supervision of the faculty.
Prerequisites: NUR 416 with C- or better

NUR 418. HEALTH CARE SYSTEM ISSUES IN NURSING PRACTICE. (3 Credits)
Consideration of the current and emerging forces that will affect health care delivery across the health care continuum. Issues related to health-care relevant policy, finance, and regulation, with special attention to the impacts on nursing care will be included.

NUR 419. HEALTH CARE QUALITY IN NURSING PRACTICE. (2 Credits)
Explores strategies that contribute to building a culture of safe, quality nursing practice. The focus is on incorporating quality assessment and improvement strategies as evidence based practice in an interdisciplinary environment.

NUR 420. NURSING RESEARCH AND EVIDENCE-BASED PRACTICE. (4 Credits)
Overview of the research process and utilization in professional nursing practice. Discussion of evidence-based practice as the foundation for safe, quality care. Reading and interpreting current research, and using writing as a tool for learning on a critical issue in nursing will be the focus of this course. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUR 414 with D- or better
Recommended: WR II requirement
NUR 421. AGING AND END OF LIFE ISSUES IN NURSING. (3 Credits)
Overview of the impact of the aging population on health care. Common ethical dilemmas encountered in health care will be explored. Application of ethical principles to the complicated situations encountered by interprofessional teams, with special consideration of those related to end-of-life care for the professional nurse.

NUR 422. HEALTH PROMOTION IN NURSING PRACTICE. (3 Credits)
Builds on prior learning and focuses on preventative health care and health promotion for individuals, families, and communities. Consideration is given to the influence of culture and lifespan development. Using biophysical, environmental, spiritual, sociocultural and economic determinants of health, the focus is on the role of nurses in improving health outcomes with individuals, families, and communities.

Prerequisites: NUR 413 with C- or better

NUR 423. NURSING LEADERSHIP. (4 Credits)
Explores the role of the nurse leader, integrating prior learning with an understanding of the nature of leadership as well as leadership and management theories. An introduction to the principles of project management with application to a clinical leadership project is included. Consideration of individual student growth, particularly related to the student outcomes of the program and personal goals for future growth will be a focus. Application of the content will occur in the 54-hour independent clinical practicum, under the direction of the faculty, to develop and implement a clinical leadership project.

Nutrition

NUTR 104. ORIENTATION TO THE NUTRITION MAJOR. (1 Credit)
Discuss and explore the academic and professional requirements for successful entry into professional careers in dietetics, foodservice systems management, and human nutrition sciences majors. Identify professional resources, career opportunities, markets and trends in these OSU Nutrition major options. Graded P/N.
Equivalent to: NFM 104

NUTR 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: NFM 199
This course is repeatable for 16 credits.

NUTR 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NUTR 216. *FOOD IN NON-WESTERN CULTURE. (3 Credits)
Cultural determinants influencing food habits of humans. Interrelation of eating patterns and socio-cultural, ecological, psychological and economic factors in cross-cultural settings. Roles of men and women in food provision. Lec/rec. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: NFM 216

NUTR 225. GENERAL HUMAN NUTRITION. (3 Credits)
The relationship of food, its nutrients and other components to the promotion of health and fitness with emphasis on the young adult. Current health concerns on a national and international level. This course is for non-majors; NES majors and those in the health sciences should take NUTR 240.
Equivalent to: NFM 225

NUTR 235. SCIENCE OF FOODS. (5 Credits)
Composition, functional properties, and structure of foods, including modified ingredients. Principles underlying preparation of food products of standard quality. Lec/lab.
Prerequisites: CH 123 with C- or better or CH 223 with C- or better or (CH 263 with C- or better or CH 263H with C- or better or CH 273 with C- or better) and (CH 233 [C-] or CH 233H [C-])
Equivalent to: NFM 235

NUTR 240. HUMAN NUTRITION. (3 Credits)
An introductory nutrition course for exercise science, nutrition, dietetics, food science, and health science majors who have taken general chemistry. Concepts of nutrient metabolism and utilization, nutrient deficiencies and toxicities and their relationship to disease prevention and treatment.
Prerequisites: (CH 121 with C- or better or CH 224H with C- or better or (CH 221 with C- or better or CH 231 with C- or better or CH 231H with C- or better))
Equivalent to: NFM 240

NUTR 241. APPLICATIONS IN HUMAN NUTRITION. (1 Credit)
Application of nutrition theory from NUTR 240 using a dietary project and hands-on recitation activities. A key focus of the course will be on applying nutrition theory. Rec.
Prerequisites: NUTR 240 (may be taken concurrently) with C- or better
Equivalent to: NFM 241

NUTR 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: NFM 299
This course is repeatable for 16 credits.

NUTR 306. PROJECTS. (1-16 Credits)
This course is repeatable for 36 credits.

NUTR 307. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

NUTR 311. FOODSERVICE PRODUCTION AND PURCHASING. (4 Credits)
Food production, purchasing, facility and materials management in foodservice operations. Quantity production styles, safety and sanitation, service methods and equipment. Lec/lab/rec.
Prerequisites: NUTR 235 with C- or better
Equivalent to: NFM 311

NUTR 312. *ISSUES IN NUTRITION AND HEALTH. (3 Credits)
Impact of nutrition as one component of complex environmental, behavioral, social, and genetic factors significant to health promotion. Apply scientific knowledge to current health issues of changing dietary patterns, technological development in food products and nutrition controversies. Recognize economic and public policy implications. Lec/rec. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: NUTR 225 with C- or better or NUTR 240 with C- or better
Equivalent to: NFM 312
Recommended: Completion of science requirement in Bacc Core

NUTR 319. PROMOTING FOOD AND NUTRITION. (3 Credits)
Strategies in promoting products, services or ideas; negotiating, advertising, public policy, consumer service, social marketing, market research, trends and strategies. Lec/lab.
Prerequisites: NUTR 240 with C- or better and NUTR 241 [C-]
Equivalent to: NUTR 219
NUTR 325. NUTRITION THROUGH THE LIFE CYCLE. (3 Credits)
Nutritional needs and concerns in pregnancy and lactation, infancy, childhood, adolescence, adult and later years.
Prerequisites: (NUTR 240 with C- or better or NUTR 225 with C- or better) and NUTR 241 [C-]
Equivalent to: NFM 325
Recommended: Junior standing

NUTR 341. NUTRITION FOR EXERCISE. (3 Credits)
Review of the interrelationship between nutrition and exercise, including macronutrient, micronutrient and fluid needs for active individuals.
CROSSLISTED as KIN 341/NUTR 341.
Prerequisites: KIN 324 with C- or better and NUTR 240 [C-]
Equivalent to: EXSS 341, KIN 341

NUTR 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: NFM 399
This course is repeatable for 16 credits.

NUTR 401. RESEARCH. (1-16 Credits)
Equivalent to: NFM 401
This course is repeatable for 16 credits.

NUTR 403. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 403
This course is repeatable for 16 credits.

NUTR 405. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 405
This course is repeatable for 16 credits.

NUTR 406. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
Equivalent to: NFM 406
This course is repeatable for 16 credits.

NUTR 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 407
This course is repeatable for 16 credits.

NUTR 408. WORKSHOP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 408
This course is repeatable for 16 credits.

NUTR 409. PRACTICUM. (1-16 Credits)
Equivalent to: NFM 409
This course is repeatable for 16 credits.

NUTR 410. FIELD EXPERIENCE. (1-15 Credits)
Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. For advanced students. Applications made and approved term preceding enrollment. Graded P/N.
Equivalent to: NFM 410
This course is repeatable for 50 credits.

NUTR 416. CULTURAL ASPECTS OF FOODS. (3 Credits)
Regional, ethnic, and religious influences on food patterns; worldwide trends in food practices. Laboratory experience with foods from several cultures. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUTR 235 with C- or better
Equivalent to: NFM 416

NUTR 417. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: BB 350 with C- or better
Equivalent to: NFM 417
Recommended: One physiology course

NUTR 418. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: NUTR 417 with C- or better
Equivalent to: NFM 418
Recommended: Biochemistry and physiology

NUTR 423. COMMUNITY NUTRITION. (4 Credits)
Meeting nutritional needs in community settings; nutritional status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist.
Prerequisites: NUTR 325 with C- or better
Equivalent to: NFM 423

NUTR 430. MEDICAL NUTRITION THERAPY I. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions. Lec/lab/rec.
Prerequisites: (BB 350 with C- or better or BB 450 with C- or better and BB 451 [C-]) and (BI 233 [C-] or BI 332 [C-]) and (BI 242 [C-] or BI 342 [C-]) and (BI 233 [C-] or BI 333 [C-]) and (BI 243 [C-] or BI 343 [C-]) and NUTR 417 [C-]

NUTR 431. MEDICAL NUTRITION THERAPY II. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Prerequisites: NUTR 430 with C- or better

NUTR 432. MEDICAL NUTRITION THERAPY III. (3 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Prerequisites: NUTR 431 with C- or better

NUTR 439. *COMMUNICATIONS IN DIETETICS. (3 Credits)
Theory and practice in food and nutrition communications in dietetics. Experience in nutritional counseling and interviewing, employee training and nutritional education materials development, public speaking, and media presentation strategies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUTR 325 with C- or better
Equivalent to: NFM 439

NUTR 446. MANAGING FOOD AND NUTRITION SERVICES. (4 Credits)
Overview of organizational structure, functions of managers in food and nutrition service organizations: human and financial resources, regulatory influences, health care organizations, current issues in operations. Lec/rec.
Prerequisites: NUTR 311 with C- or better
Equivalent to: NFM 446

NUTR 447. MANAGEMENT OF FOOD SYSTEMS LABORATORY. (3 Credits)
Application of theory in managing a university food service as part of a student team: planning, production, projecting resource needs, evaluation of outcomes and financial goals.
Equivalent to: NFM 447
Recommended: NUTR 446 or NUTR 546
NUTR 499. SPECIAL TOPICS IN DIETETICS. (1-16 Credits)
Current issues, trends, and topics in nutrition and dietetics. May be repeated for credit when topic varies.
Equivalent to: NFM 499
This course is repeatable for 16 credits.

NUTR 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 501
This course is repeatable for 16 credits.

NUTR 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 502
This course is repeatable for 16 credits.

NUTR 503. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 503
This course is repeatable for 999 credits.

NUTR 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 505
This course is repeatable for 16 credits.

NUTR 506. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 506
This course is repeatable for 16 credits.

NUTR 507. SEMINAR. (1-16 Credits)
1 credit graded P/N.
Equivalent to: NFM 507
This course is repeatable for 16 credits.

NUTR 508. WORKSHOP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 508
This course is repeatable for 16 credits.

NUTR 509. PRACTICUM. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 509
This course is repeatable for 16 credits.

NUTR 510. FIELD EXPERIENCE: INTERNSHIP. (1-16 Credits)
Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. Limited to students admitted to degree program. Application made and approved in the term preceding enrollment. No more than 6 credits may be applied to a master's degree program.
Equivalent to: NFM 510
This course is repeatable for 6 credits.

NUTR 514. HEALTH BENEFITS OF FUNCT FOODS, NUTRACEUT, DIETARY SUPPLEMENT. (3 Credits)
Functional foods, nutraceuticals and dietary supplements represent a rapidly expanding segment of domestic and international markets. This course will overview the principles and procedures necessary to evaluate and market these products. The chemistry and mechanisms of major nutraceutical ingredient categories and current scientific information supporting their biochemical and physiological efficacy will be addressed. Special dietary products, such as medical, weight control, sport, and herbal supplements, will be addressed. Regulatory aspects of labeling and structure-function claims will be covered. CROSSTLISTED as FST 514/NUTR 514.
Equivalent to: FST 514, NFM 514
Recommended: BB 350 and CH 332

NUTR 516. CULTURAL ASPECTS OF FOODS. (3 Credits)
Regional, ethnic, and religious influences on food patterns; worldwide trends in food practices. Laboratory experience with foods from several cultures. Lec/lab.
Equivalent to: NFM 516
Recommended: NUTR 235

NUTR 517. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Equivalent to: NFM 517
Recommended: BB 350 and one physiology course

NUTR 518. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: NUTR 517 with C or better
Equivalent to: NFM 518
Recommended: biochemistry, physiology.

NUTR 523. COMMUNITY NUTRITION. (4 Credits)
Meeting nutritional needs in community settings; nutritional status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist.
Equivalent to: NFM 523
Recommended: NUTR 325

NUTR 525. ORGANIC FOOD AND HEALTH: EVIDENCE AND CONSUMER PERCEPTIONS. (3 Credits)
Overview of organic food including an understanding of the definition, certifications and labeling; basic production comparisons with conventional foods, evidence for comparisons between organic and conventionally produced foods; consumer attitudes and perceptions regarding organic foods.

NUTR 530. MEDICAL NUTRITION THERAPY I. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions. Lec/lab/rec.
Recommended: (BB350 or (BB450 and BB 451)) and (BI 232 or BI 332) and (BI 242 or BI 342) and (BI 233 or BI 333) and (BI 243 or BI 343) and NUTR 439 and completion or concurrent enrollment in NUTR 417

NUTR 531. MEDICAL NUTRITION THERAPY 2. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Recommended: NUTR 430
NUTR 532. MEDICAL NUTRITION THERAPY 3. (3 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Recommended: NUTR 431

NUTR 535. NUTRITION AND EXERCISE: MACRONUTRIENTS AND ENERGY METABOLISM. (3 Credits)
Current research examining the interrelationship of macronutrients and exercise and energy balance will be reviewed, including their roles in health, disease prevention and exercise performance.
Equivalent to: NFM 535
Recommended: NUTR 517 or KIN 533

NUTR 539. COMMUNICATIONS IN DIETETICS. (3 Credits)
Theory and practice of food and nutrition communications in dietetics. Experience in nutritional counseling and interviewing, employee training and nutritional education materials development, public speaking, and media presentation strategies.
Equivalent to: NFM 539
Recommended: NUTR 325

NUTR 546. FOODSERVICE ORGANIZATIONS. (3 Credits)
Overview of organizational structure, functions of managers in foodservice organizations: human resources, regulatory influences, health care organizations, current issues in operations. Lec/rec.
Equivalent to: NFM 546
Recommended: NUTR 311 and NUTR 445

NUTR 550. NUTRITIONAL STATUS. (4 Credits)
Research studies with emphasis on estimation of nutrient intake and assessment of nutritional status, including biochemical, clinical, epidemiological and anthropometric measures. Interpretation of status indicators.
Equivalent to: NFM 550
Recommended: NUTR 418 or NUTR 518

NUTR 551. ADVANCED MEDICAL NUTRITION THERAPY. (4 Credits)
This advanced course includes evidence-based practices and standards of care available to address complex scenarios for which medical nutrition therapy is an integral part of patient care. Students will build on prior assessment, nutritional diagnostic, implementation, monitoring, evaluation and documentation skills relevant to dietetics practice. Lecture, readings, case studies including professional documentation and expert guests will be used to illustrate medical nutrition therapy addressing topics such as as domestic malnutrition, nutrition support, pediatric nutrition, eating disorders, diabetes and geriatric nutrition.

NUTR 552. FOOD AND NUTRITION PROGRAM MANAGEMENT AND EVALUATION. (4 Credits)
Introduction to the evaluation of outcomes and impacts of food/nutrition-related systems, performance, interventions, programs and/or policies. Application of methods used to appraise problems or activities, as well to conceptualize, create, implement and administer evaluations in order to make decisions regarding their outcomes, impacts, efficiency and cost effectiveness. A case study approach across a range of food and nutrition-related public, government and private organizations will introduce the breadth of approaches in such evaluations.

NUTR 553. DIETARY BEHAVIOR AND COUNSELING. (4 Credits)
Strategies for navigating dietary behavior using collaborative, patient centered, goal-oriented approaches. Introduces the theoretical framework around dietary behavior and motivational interviewing with methods regarding the language of change and creating client/patient interest in change. Guided practice and focus on development of skills.

NUTR 599. SPECIAL TOPICS IN NUTRITION. (1-16 Credits)
Current issues, trends, and topics in nutrition and health. May be repeated for credit when topic varies.
Equivalent to: NFM 599
This course is repeatable for 16 credits.

NUTR 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

NUTR 602. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 602
This course is repeatable for 16 credits.

NUTR 603. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 603
This course is repeatable for 999 credits.

NUTR 605. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 605
This course is repeatable for 16 credits.

NUTR 607. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 607
This course is repeatable for 16 credits.

NUTR 609. PRACTICUM. (1-16 Credits)
Equivalent to: NFM 609
This course is repeatable for 16 credits.

NUTR 610. INTERNSHIP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 610
This course is repeatable for 16 credits.

NUTR 617. ADVANCED MACRONUTRIENT METABOLISM. (3 Credits)
Focuses on human macronutrient metabolism. Macronutrient topics include water, carbohydrate, lipid, amino acid/protein, lipid and carbohydrate and energy metabolism. Emphasis is placed on the integration of metabolism at the molecular, biochemical and physiological level. Moreover, the class examines contemporary issues relevant to macronutrient metabolism and human disease. Offered even years in spring term.
Equivalent to: NFM 617
Recommended: NUTR 418 or NUTR 518

NUTR 618. ADVANCED MICRONUTRIENT METABOLISM. (3 Credits)
Focus is on human micronutrient metabolism. Topics include micronutrients (vitamins and minerals), phytochemicals and mammalian metabolism. Emphasis will be placed on the integration of micronutrient/phytochemical metabolism at the molecular, biochemical and physiological level. Moreover, the class examines contemporary issues relevant to micronutrient/phytochemical metabolisms and human disease.
Equivalent to: NFM 618
Recommended: NUTR 418 or NUTR 518 and basic knowledge of biochemistry and physiology

NUTR 699. SPECIAL TOPICS IN NUTRITION RESEARCH. (1-16 Credits)
Current issues, trends, and topics in nutrition research. May be repeated for credit when topic varies.
Equivalent to: NFM 699
This course is repeatable for 16 credits.
Physical Activity Courses

PAC 100. ADAPTED PHYSICAL ACTIVITY. (1 Credit)
Individual workout for students with permanent or temporary physical disabilities and for students enrolled in another PAC who sustain an injury.
This course is repeatable for 11 credits.

PAC 102. AQUA AEROBICS. (1 Credit)
Fitness class using a variety of movements in shallow and deep water, mostly in a vertical position. Do not need swimming skills.
Equivalent to: PAC 101
This course is repeatable for 11 credits.

PAC 103. DEEP WATER FITNESS. (1 Credit)
Fitness class using a variety of movements in a deep water pool, mostly in a vertical position. Should be comfortable in deep water.
This course is repeatable for 11 credits.

PAC 104. ARCHERY. (1 Credit)
Basic mechanics and introduction to archery. Exposure to varying archery techniques and equipment, including recurve and compound bow shooting.
This course is repeatable for 11 credits.

PAC 105. CPR/FIRST AID. (1 Credit)
Introduces cardiac and first aid emergency response procedures. Emphasis placed on safe response, chain of survival, quality CPR (adults, children, infants and team responses), use of an AED, medical emergencies, injury emergencies and environmental emergencies. Students successfully completing the American Heart Association certification requirements will be issued a Heartsaver First Aid and BLS (Basic Life Support) for the Healthcare Provider certification at the end of the course.
This course is repeatable for 11 credits.

PAC 106. BEAVER FIT. (1 Credit)
A conditioning class for those of all fitness levels that focuses on mobility, functional movement, and high-intensity interval training as a means to improve cardiovascular fitness, muscular fitness, and flexibility.
This course is repeatable for 11 credits.

PAC 108. STEP AEROBICS. (1 Credit)
Low-impact, high intensity workout adjustable to all fitness levels utilizing adjustable height benches. Strengthening and flexibility exercises included.
This course is repeatable for 11 credits.

PAC 109. INTRODUCTION TO WHITE WATER KAYAKING. (2 Credits)
Students learn fundamentals of white water kayaking in sheltered water based on the internationally recognized British Canoe (BC) teaching and skills certification system. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course runs for six class sessions of 3 hours (Fridays), and one mandatory Saturday (5-hour) session. The entire class lasts for six weeks.
This course is repeatable for 11 credits.

PAC 110. INTRODUCTION TO CANOEING. (2 Credits)
Students learn fundamentals of canoeing in sheltered water based on the internationally recognized British Canoe (BC) teaching and skills certification system. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course runs for six class sessions of 3 hours (Fridays), and one mandatory Saturday (5-hour) session. The entire class lasts for six weeks.
This course is repeatable for 11 credits.

PAC 112. LEARNING KAYAK ROLLING BASICS. (2 Credits)
Students learn fundamentals of rolling a kayak in an indoor pool-based environment. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course.
This course is repeatable for 10 credits.

PAC 113. BADMINTON I. (1 Credit)
Singles and doubles skills, practice, rules, and strategy play.
This course is repeatable for 11 credits.

PAC 114. BADMINTON II. (1 Credit)
Intermediate skill development in badminton.
This course is repeatable for 11 credits.
Recommended: Fundamental skills, rules and strategy of singles and doubles play.

PAC 115. OUTDOOR LIVING SKILLS. (2 Credits)
Educates and introduces students on how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. Classroom and field (lab) experience. Includes one mandatory weekend overnight outing. CROSSTLISTED as PAC 115/TRAL 115.
Equivalent to: TRAL 115
This course is repeatable for 4 credits.

PAC 116. BASKETBALL I (MEN/WOMEN). (1 Credit)
Fundamental basketball skills, drills, rules, strategies, and practice. Game play appropriate for the skill level.
This course is repeatable for 11 credits.

PAC 117. BASKETBALL COMPETITIVE. (1 Credit)
Team play, individual and team skills developed and refined, competitive round robin tournaments.
This course is repeatable for 11 credits.
Recommended: Prior competitive experience.

PAC 118. LABORATORY FOR OUTDOOR LIVING SKILLS. (1 Credit)
Practical field application of concepts learned in PAC 115/TRAL 115, Outdoor Living Skills. Field (lab) experience includes one mandatory weekend overnight. Introduces how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. CROSSTLISTED as PAC 118/TRAL 118.
Corequisites: PAC 115
Equivalent to: TRAL 118
This course is repeatable for 2 credits.

PAC 120. MOUNTAIN BIKING. (1 Credit)
Touring trails in Corvallis area; riding techniques, safety, maintenance, environmental concerns. Required equipment: mountain bike, tire repair kit, helmet.
This course is repeatable for 11 credits.

PAC 121. BILLIARDS. (1 Credit)
Skills, technique, strategy, game knowledge as introduction to billiards (pool), a ‘cue’ sport; rules and gaming for variations of pocket billiards; practice and class tournament play.
This course is repeatable for 11 credits.

PAC 122. BODY SCULPTING. (1 Credit)
Fitness workout set to music using lighter resistance training aids such as dumbbells, resistance tubing, bands, and aerobic steps.
This course is repeatable for 11 credits.
PAC 123. BOWLING I. (1 Credit)
Fundamentals of the game including etiquette, spot bowling, natural hook and straight ball delivery, scoring, handicap computation, spare pickup, and error correction. Additional fee; equipment supplied.
This course is repeatable for 11 credits.

PAC 124. BOWLING II. (1 Credit)
Review and refinement of basic fundamentals of bowling. Emphasis on spot bowling, adjusting for lane conditions, choices in equipment, league play, and mental training.
This course is repeatable for 11 credits.
Recommended: Bowling I or the ability to bowl above a 110 average

PAC 126. CARDIO KICKBOXING I. (1 Credit)
High intensity group workout set to motivational music and combining skills and techniques from boxing, kickboxing, and other martial arts.
This course is repeatable for 11 credits.

PAC 129. CARDIO COMBO. (1 Credit)
Combination of aerobic training classes that use music such as Cardio Kickboxing, Body Sculpture, Sports Conditioning, and/or Step Aerobics. Actual curriculum may vary with instructors.
This course is repeatable for 11 credits.

PAC 130. CONDITIONING. (1 Credit)
Total body approach to fitness, cardiorespiratory conditioning, muscular strength and endurance; flexibility emphasized. May follow a specific training format, e.g., ROTC section follows Army conditioning format.
This course is repeatable for 11 credits.

PAC 131. SNOWBOARD-SKI CONDITIONING. (1 Credit)
Strength, muscular endurance, flexibility, balance, and cardiovascular exercises specific to downhill skiing and snowboarding; designed to help prepare students for participation in these sports.
This course is repeatable for 11 credits.

PAC 132. TAP I. (1 Credit)
Individual and group dance with specialized shoes; basic step technique and vocabulary; warm up exercises progressing into rhythmic combinations performed to music; culminates in full routine to music.
This course is repeatable for 11 credits.

PAC 133. DANCE: TAP I. (1 Credit)
Introduction to basic tap technique and aesthetics, terminology, alignment, stretch and strength exercises. No previous dance experience needed. Additional fee for accompanist.
This course is repeatable for 11 credits.

PAC 134. DANCE: SALSA I. (1 Credit)
Choreographic combinations. Additional fee for accompanist.
This course is repeatable for 11 credits.

PAC 135. DANCE: COUNTRY WESTERN I (MEN/WOMEN). (1 Credit)
Focus on traditional Country Western Swing patterns. Emphasizes fundamentals of leading and following. No prior experience needed.
This course is repeatable for 11 credits.

PAC 136. DANCE: BALLET I. (1 Credit)
Intermediate moves, rhythmic accents and step combinations of Salsa; development of leading and following. Additional fee for accompanist.
This course is repeatable for 11 credits.
Recommended: Ballet I or previous ballet experience

PAC 137. DANCE: BALLET II. (1 Credit)
Intermediate and advanced ballet technique, comprehensive exploration of the discipline. Additional fee for accompanist.
This course is repeatable for 11 credits.
Recommended: Ballet II, previous comparable experience

PAC 138. DANCE: BALLET III. (1 Credit)
Aerobic/energetic experience consisting of a warm-up/conditioning and choreographic combinations.
This course is repeatable for 11 credits.

PAC 139. HIP HOP DANCE. (1 Credit)
Intermediate jazz technique, isolations and combinations.
This course is repeatable for 11 credits.

PAC 140. DANCE: JAZZ I. (1 Credit)
Introduction to jazz dance, technique, isolations, and combinations.
Different jazz styles are explored. No previous dance experience is necessary.
This course is repeatable for 11 credits.

PAC 141. DANCE: JAZZ II. (1 Credit)
Intermediate jazz technique, isolations and combinations.
This course is repeatable for 11 credits.
Recommended: Jazz I or comparable experience

PAC 142. DANCE: MODERN I. (1 Credit)
An intermediate level of modern dance technique and movement expression. Additional fee for accompanist.
This course is repeatable for 11 credits.
Recommended: Modern Dance I or comparable experience

PAC 143. DANCE: MODERN II. (1 Credit)
Higher concepts of Cuban Salsa (Casino) as well as Rueda de Casino with focus on musical development and fundamentals of leading and following in partner dance.
This course is repeatable for 11 credits.

PAC 144. DANCE: CUBAN SALSA I (MEN/WOMEN). (1 Credit)
Foundations of Cuban Salsa (Casino) as well as Rueda de Casino with focus on musical development and fundamentals of leading and following in partner dance.
This course is repeatable for 11 credits.

PAC 145. DANCE: CUBAN SALSA II. (1 Credit)
Focus on traditional Country Western Swing patterns. Emphasizes fundamentals of leading and following. No prior experience needed.
This course is repeatable for 11 credits.

PAC 146. DANCE: MODERN II. (1 Credit)
Higher concepts of Cuban Salsa (Casino) as well as Rueda de Casino with focus on musical development and fundamentals of leading and following in partner dance.
This course is repeatable for 11 credits.
Recommended: Cuban Salsa I or comparable experience

PAC 147. DANCE: JOINTS II. (1 Credit)
Focus on traditional Country Western Swing patterns. Emphasizes fundamentals of leading and following. No prior experience needed.
This course is repeatable for 11 credits.

PAC 148. DANCE: CULTURAL WORLD DANCE (MEN/WOMEN). (1 Credit)
Introduction to traditional dance forms from Europe, Israel, North America and Asia, focusing on movement, cultural heritage, history, and diversity.
This course is repeatable for 11 credits.

PAC 149. DANCE: JAZZ III. (1 Credit)
Non-partner dance routines in country western style; musical interpretation, footwork, and sequencing of 20 different routines.
This course is repeatable for 11 credits.

PAC 150. SNOWBOARD-SKI CONDITIONING. (1 Credit)
Steps and rhythmic accent of Salsa and Merengue style; fundamentals of leading and following; basic moves and combinations. No prior experience needed.
This course is repeatable for 11 credits.

PAC 151. COUNTRY LINE DANCE. (1 Credit)
Intermediate moves, rhythmic accents and step combinations of Salsa; development of leading and following.
Prerequisites: PAC 152 with C- or better
This course is repeatable for 11 credits.

PAC 152. DANCE: SALSA II. (1 Credit)
Focus on traditional Country Western Swing patterns. Emphasizes fundamentals of leading and following. Also including introduction to waltz, two-step, cowboy cha-cha and 10-step polka.
Equivalent to: PAC 144
This course is repeatable for 11 credits.
PAC 155. DANCE: COUNTRY WESTERN II (MEN/WOMEN). (1 Credit)
Build on CW I with advanced waltz, two-step, and cha-cha patterns; introduces schottische and East Coast swing.
This course is repeatable for 11 credits.
Recommended: Country Western I or comparable experience

PAC 156. DANCE: COUNTRY WESTERN III (MEN/WOMEN). (1 Credit)
Advanced two-step patterns and styling with a focus on musical interpretation; development of leading and following.
Prerequisites: PAC 155 with C- or better
This course is repeatable for 11 credits.

PAC 158. DANCE: BEGINNING SWING (MEN/WOMEN). (1 Credit)
Introduction to single time, double time, and triple time (jitterbug) swing; variations for each style, covering most swing music rhythms. Emphasizes fundamentals of leading and following. Men/women.
This course is repeatable for 11 credits.

PAC 159. DANCE: BALLROOM I (MEN/WOMEN). (1 Credit)
Posture and alignment, fundamentals of leading and following, basic steps and variations for waltz, foxtrot, swing, tango, and cha-cha.
Equivalent to: PAC 134
This course is repeatable for 11 credits.

PAC 160. DANCE: BALLROOM II (MEN/WOMEN). (1 Credit)
Additional steps and patterns of popular ballroom dances.
Prerequisites: PAC 159 with C- or better
Equivalent to: PAC 135
This course is repeatable for 11 credits.

PAC 161. DANCE: BALLROOM III (MEN/WOMEN). (1 Credit)
Styling: additional dances: rhumba, silver fox trot, and Viennese waltz; advanced dance figures for tango and cha-cha.
Prerequisites: PAC 160 with C- or better
This course is repeatable for 11 credits.

PAC 162. DANCE: SWING II (MEN/WOMEN). (1 Credit)
Social dance focusing on Twenties-style Charleston, pure Balboa and Balboa-Swing, and Blues Dance.
This course is repeatable for 11 credits.

PAC 163. DANCE: LATIN I. (1 Credit)
Latin dances including cha-cha, mambo, salsa, rhumba, merengue, bolero,alsa, and paso doble. Emphasis on proper styling and technical execution of each dance; effective leading and following techniques.
Prerequisites: PAC 159 with C- or better
This course is repeatable for 11 credits.

PAC 165. DANCE: WEST COAST SWING (MEN/WOMEN). (1 Credit)
Focus on style, technique and many different step patterns of the west coast swing dance.
Prerequisites: PAC 154 with C- or better or PAC 159 with C- or better
Equivalent to: PAC 162
This course is repeatable for 11 credits.

PAC 166. BALLROOM 2 STEP, HUSTLE (MEN/WOMEN). (1 Credit)
Smooth, romantic social dance that is neither ballroom, Latin, nor swing but a rhythm dance identified as club-style, danced to contemporary ballad-like music. Hustle is fast-paced, swing-related dance to disco beat. Class encompasses intermediate step patterns, technique and styling, stationary, traveling patterns.
Prerequisites: PAC 160 with C- or better
This course is repeatable for 11 credits.

PAC 167. DANCE: LINDY HOP (1 Credit)
Ballroom dance style based on original eight-count swing dance evolved in Harlem ballrooms during the late 1920s; styling emphasized.
Prerequisites: PAC 158 with C- or better or PAC 159 with C- or better
This course is repeatable for 11 credits.

PAC 168. DANCE: LINDY HOP II (MEN/WOMEN). (1 Credit)
Intermediate patterns, syncopations, play techniques, and styling with a focus on musical interpretation in the Lindy Hop style; development of leading and following.
Prerequisites: PAC 167 with C- or better
This course is repeatable for 11 credits.

PAC 169. COOL SHOES, BALLROOM PERFORMANCE. (2 Credits)
Learn and perform ballroom dance routines on an intermediate level. This course is a full year commitment ending with a dance concert in the spring.
This course is repeatable for 12 credits.

PAC 170. DANCE: WEST COAST SWING II (MEN/WOMEN). (1 Credit)
Intermediate patterns, syncopations, play techniques, and styling with a focus on musical interpretation; development of leading and following.
Prerequisites: PAC 165 with C- or better
This course is repeatable for 11 credits.

PAC 171. DANCE: NEW SHOES. (1 Credit)
Introduces students to formation ballroom dancing at a beginner level. Dances learned over the course of this term will be determined by the instructor at the beginning of the term.
Prerequisites: PAC 159 with D- or better
This course is repeatable for 11 credits.

PAC 173. INTERMEDIATE ROCK CLIMBING. (2 Credits)
Introduces variety of basic skills, gear and systems that will allow them to safely participate in a single pitch rock climbing environment based on internationally recognized American Mountain Guides Association (AMGA) teaching and skills certification systems. Presents students with various technical skills that will serve as a foundation for future land-based outdoor disciplines. Students will be introduced to gear, such as software (ropes, webbing, harnesses) and hardware (carabiners, friction devices); skills, such as knots, belaying, rappelling, lead climbing; and systems such as anchors and basic rescue techniques. CROSSLISTED as PAC 173/TRAL 173.
Equivalent to: TRAL 173
This course is repeatable for 10 credits.

PAC 174. FLAG FOOTBALL. (1 Credit)
Skill instruction and practice; drills; strategies, game play of American football; emphasis on teamwork and sportsmanship in a competitive but non-threatening or stressful environment.
This course is repeatable for 11 credits.

PAC 178. FLY FISHING I. (1 Credit)
Casting and fishing techniques, lure making, equipment selection, terminology, and regulation for fishing in Oregon's marine environment. This course is repeatable for 11 credits.

PAC 179. FLY FISHING II. (1 Credit)
Advanced fly casting and fly fishing techniques for trout, fly-tying, equipment selection, basic aquatic organism identification, terminology, and regulations for fishing in Oregon's freshwater environment.
This course is repeatable for 11 credits.
PAC 180. STEELHEAD FISHING. (1 Credit)
Casting and fishing techniques, lure making, equipment selection, terminology, and regulations for fishing in Oregon's marine environment for steelhead.
This course is repeatable for 11 credits.

PAC 182. DISC GOLF I. (1 Credit)
Techniques for throwing discs; equipment, knowledge, etiquette, and rules associated with playing a disc golf course; experience playing practice and official disc golf courses.
This course is repeatable for 11 credits.

PAC 184. GOLF I. (1 Credit)
Basic fundamental principles in all phases of golf; rules, terminology, etiquette, safety and scoring. Equipment provided.
This course is repeatable for 11 credits.

PAC 185. GOLF II. (1 Credit)
Individual practice and course play; skill refinement as continuation of Golf I. Equipment available. Course play expected, additional fee.
This course is repeatable for 11 credits.
Recommended: Golf I

PAC 186. GOLF III. (1 Credit)
Advanced skills, knowledge involved in competitive play. Course play expected, additional fee.
This course is repeatable for 11 credits.
Recommended: Handicap below 15 or Golf II; competitive play.

PAC 188. GYMNASTICS. (1 Credit)
Fundamental techniques on vault, bars, beam, and floor.
This course is repeatable for 11 credits.

PAC 189. GYMNASTICS II. (1 Credit)
Build upon previous gymnastics experiences or classes; floor exercise, uneven parallel bars, vault, mini-trampoline and beam apparatus are available.
This course is repeatable for 11 credits.
Recommended: Gymnastics I or competitive experience.

PAC 190. KARATE. (1 Credit)
Instruction in traditional Japanese karate basic striking and blocking techniques, kata (forms), philosophy, conditioning, and etiquette. Self-defense applications are also emphasized.
Equivalent to: PAC 183
This course is repeatable for 11 credits.

PAC 191. BRAZILIAN JIU-JITSU. (1 Credit)
Basic level grappling self-defense techniques and applying them in sparring sessions along with understanding the core principles which make this martial arts system effective. An introduction to the history of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and culture.
This course is repeatable for 11 credits.

PAC 192. JUDO I. (1 Credit)
Skill instruction in landing, throwing and grappling for this style of martial arts; etiquette for practice and competition; basic knowledge of vocabulary, rules and scoring.
This course is repeatable for 11 credits.

PAC 193. JUDO II. (1 Credit)
Intermediate skill instruction in landing, throwing, pins, chokes in Kodokan Judo style; principles of Seiryoku-Zenyou and Jita-Kyoei designed to help individuals become better members of society through training body and mind; instruction for competition knowledge and skills. Judo etiquette for practice and competition expected.
This course is repeatable for 11 credits.
Recommended: Judo I or comparable experience

PAC 194. PILATES. (1 Credit)
Non-impact, invigorating approach to physical conditioning and mind/body awareness; helps develop core body strength, improve posture and balance, and increase muscle endurance, tone, flexibility.
This course is repeatable for 11 credits.

PAC 195. PILATES II. (1 Credit)
Progression of Joseph Pilates mat exercises; emphasis on intermediate and advanced levels; application of Pilates' principles to new exercises; use of props; application of principles to daily living.
This course is repeatable for 11 credits.
Recommended: PAC 194, Pilates.

PAC 197. PICKLEBALL. (1 Credit)
Fast-paced, self-officiated net game with similarities to tennis, badminton, table tennis, and racquetball. Course covers rules, strategies, technique, preparation for play, and includes extensive active practice and play; played with two, three, or four people.
This course is repeatable for 11 credits.

PAC 199. SPECIAL TOPICS. (1-3 Credits)
Experimental or new classes.
This course is repeatable for 11 credits.

PAC 201. RELAXATION. (1 Credit)
Introduction to techniques that promote relaxation of the nervous system. These may include, but are not limited to: meditation, imagery, yoga postures, and self-massage. Students will be encouraged to reflect on how life choices influence their nervous system.
This course is repeatable for 11 credits.

PAC 202. MEDITATION. (1 Credit)
Examine the application of building simple awareness, how to manage thoughts in productive and compassionate ways, and how to transfer these skills into healthy relationships. Explore strategies for managing mental and physical difficulties including anxiety, pain, and overall stress through experiential learning and personal sharing of experiences.
This course is repeatable for 11 credits.

PAC 203. OBSERVATION & ASSISTANT INSTRUCTIONAL PRACTICE IN PHYS ACT. (1 Credit)
Observe and begin physical activity instruction within dance, yoga, sports, fitness, aquatics, martial arts, or cross-disciplinary physical activities. Used in several of the leadership training program curriculums.
This course is repeatable for 11 credits.

PAC 204. LEAD INSTRUCTIONAL PRACTICE IN PHYSICAL ACTIVITY. (1 Credit)
Lead physical activity curriculum within dance, yoga, fitness, aquatics, sports, martial arts, or cross-disciplinary physical activities. Gain experience implementing already designed lesson plans, assessment, and leading peers through basic exercise, while supervised by university and program personnel.
Prerequisites: PAC 203 with C- or better
This course is repeatable for 11 credits.
PAC 205. ROWING, CREW I (MEN/WOMEN). (1 Credit)
Introduction to the sport of rowing; designed for the novice (beginner).
Includes basic technique and terminology, related water safety, and
development of strength, endurance, and flexibility.
This course is repeatable for 11 credits.
Recommended: Swim Test (1).

PAC 208. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PAC 212. RUNNING, JOGGING. (1 Credit)
Cardiorespiratory fitness with scenic running routes; training, nutrition,
and physiology. Beginning and intermediate level.
This course is repeatable for 11 credits.

PAC 213. RUNNING: 10K TRAINING. (1 Credit)
Intermediate to advanced conditioning and training program for road
racing.
This course is repeatable for 11 credits.
Recommended: Prior training in running.

PAC 214. HALF MARATHON TRAINING. (2 Credits)
Progressive training combining walking, running, core strengthening,
time techniques in preparation for a 13.1 mile (1/2 marathon) event.
Open to all levels; may choose to walk, walk/run, or run.
This course is repeatable for 11 credits.

PAC 215. RUGBY, TOUCH. (1 Credit)
Basic skills of open field rugby; emphasis on ball handling and attacking
strategy; rules and history; game play.
This course is repeatable for 11 credits.

PAC 217. SELF DEFENSE. (1 Credit)
Nonviolent self-defense. Develop self-confidence and skills for assault
situations. Conditioning and practical skills. Men and women, all levels.
This course is repeatable for 11 credits.

PAC 224. TELEMARK SKIING. (1 Credit)
Winter sport that is a cross between cross country and downhill
skiing. Requires telemark equipment where the heel is unattached.
Class accommodates all levels and practices on the downhill slopes.
Additional fee covers bus transportation, lessons, and lift ticket. Rental of
equipment is not included.
This course is repeatable for 11 credits.

PAC 225. DOWNHILL SKIING. (1 Credit)
Travel to area facilities, 1-1/2 hour lesson followed by open practice,
students grouped according to skill level: beginner, intermediate,
advanced, racer. Special fee covers bus transportation, lessons, and lifts.
Additional fee for rentals.
This course is repeatable for 11 credits.

PAC 227. SNOWBOARDING. (1 Credit)
Travel to area facilities, 1 1/2 hour lesson followed by open practice,
students grouped according to skill level: beginner, intermediate,
advanced. Special fee covers bus transportation, lessons, and lifts.
Additional fee for rentals.
This course is repeatable for 11 credits.

PAC 229. SOCCER I. (1 Credit)
Basic skills of controlling the ball; conditioning; lead-up games; team
play.
Equivalent to: PAC 211
This course is repeatable for 11 credits.

PAC 230. SOCCER II. (1 Credit)
Review of basic skills of offense and defense in controlled game play;
concepts of team position and play, pressure and attack.
This course is repeatable for 11 credits.
Recommended: Previous soccer experience.

PAC 231. SOCCER III. (1 Credit)
High level soccer skills; team play and transition concepts; set plays and
alignments for both offense and defense.
This course is repeatable for 11 credits.
Recommended: Soccer II or competitive playing experience.

PAC 232. SOCCER: INDOOR. (1 Credit)
Skill instruction and development; strategies and rules for indoor play;
game play in indoor gymnasium.
This course is repeatable for 11 credits.

PAC 236. SOFTBALL, WHIFFLEBALL. (1 Credit)
Skills, rules, strategies, practice, and game play of the popular outdoor
slow pitch game. Modified softball with whiffleball when play is indoors.
This course is repeatable for 11 credits.
PAC 247. SURFING. (1 Credit)
Knowledge and fundamental skills of this aquatic sport including history, terminology, safety precautions, the ocean environment, and equipment. Additional fee.
This course is repeatable for 11 credits.

PAC 248. SWIM: NON-SWIMMER. (1 Credit)
Skills for self-rescue; fundamental skills in swimming and safety. Designed for people with a fear of water. Recommended S/U grading.
Equivalent to: PAC 219
This course is repeatable for 11 credits.

PAC 249. LIFEGUARD TRAINING. (1 Credit)
Trains participants in the skills required to become a lifeguard. Emphasis on professional behavior, water rescues, safe response, quality CPR (adults, children, infants, and team responses), use of an AED and first aid. Students successfully completing the American Red Cross certification requirements will be issued a lifeguarding certification at the end of the course.
This course is repeatable for 11 credits.
Recommended: Basic swimming skills

PAC 250. SWIM I. (1 Credit)
Swimming concepts, survival and breathing techniques, front crawl and elementary backstroke as minimum instruction.
This course is repeatable for 11 credits.
Recommended: Basic swimming skills: float, tread water, bobbing

PAC 252. SWIM II. (1 Credit)
Fitness swimming, swimming strokes and skills.
Equivalent to: PAC 221
This course is repeatable for 11 credits.
Recommended: Swim I or the ability to front crawl continuously for 75 yards

PAC 253. SWIM TRAINING WORKOUT. (1 Credit)
Competitive skills and strokes; emphasis on training.
This course is repeatable for 11 credits.
Recommended: Ability to do interval training.

PAC 254. COMPETITIVE SWIMMING. (1 Credit)
Prepares students for competitive swimming and emphasizes lifetime aquatic fitness; interval swim workouts designed for speed and endurance; instruction on legal techniques of strokes and turns; culminates in intra-class swim meet; 2,000-3,000 yards/day.
This course is repeatable for 11 credits.
Recommended: Swim II or previous interval training experience up to 400 yard distances

PAC 256. TAIJI, TAI CHI I. (1 Credit)
Introduction to ancient Chinese ‘internal martial art’ based upon concepts of Yin and Yang; detailed slow and relaxed form movements provide benefits to body, mind, and spirit.
This course is repeatable for 11 credits.

PAC 257. TAIJI, TAI CHI II. (1 Credit)
Continuation of study of the Yang-style Taiji form; more in-depth exploration of underlying principles and push-hands exercises.
This course is repeatable for 11 credits.

PAC 260. TENNIS I. (1 Credit)
Introduction to fundamental strokes, singles and doubles play, scoring, and basic concepts in tennis.
Equivalent to: PAC 234
This course is repeatable for 11 credits.

PAC 261. TENNIS II. (1 Credit)
Review and refinement of fundamental strokes; volley, lob, return of serve; introduction to singles and doubles strategy.
Equivalent to: PAC 235
This course is repeatable for 11 credits.
Recommended: Tennis I or competitive tennis experience

PAC 262. TENNIS III. (1 Credit)
Focus on ground stroke, serve consistency; approach shots and overheads; tactics for net and baseline play.
This course is repeatable for 11 credits.
Recommended: Tennis II

PAC 264. TEAM HANDBALL/(MEN/WOMEN). (1 Credit)
Fast-paced indoor court game that combines skills and strategies similar to water polo, basketball, soccer and hockey; rules, regulations, strategies, and skills introduced and practiced; requires teamwork, cooperation, and court strategy.
This course is repeatable for 11 credits.

PAC 265. TUMBLING I. (1 Credit)
Technical instruction, progressions, and practice in basic, intermediate, and advanced tumbling skills; emphasis on safety and fitness concepts; floor and mini-trampoline skills; no apparatus instruction.
This course is repeatable for 11 credits.

PAC 266. TUMBLING II. (1 Credit)
Technical instruction, progressions, safety, and practice building upon skills taught in PAC 265, Tumbling I.
This course is repeatable for 11 credits.
Recommended: Tumbling I or prior experience.

PAC 268. TRIATHLON TRAINING. (2 Credits)
Training in swimming, running, and bicycling to prepare for triathlon participation. Strategies, transitioning technique, and weight training information; training plan formation; event planning; culminates in class or community event.
This course is repeatable for 11 credits.
Recommended: Experience in at least one of the three activities.

PAC 271. ULTIMATE FRISBEE. (1 Credit)
Fundamentals for the beginning and intermediate player; individual skill development, rules, game play, and strategy.
This course is repeatable for 11 credits.

PAC 273. VOLLEYBALL I. (1 Credit)
Fundamental volleyball skills, drills, rules, strategies, and practice. Game play appropriate for skill level.
This course is repeatable for 11 credits.

PAC 274. VOLLEYBALL II. (1 Credit)
Fundamental skills and knowledge refined; intermediate skills developed, competitive play.
This course is repeatable for 11 credits.
Recommended: Volleyball I and good fundamental skills.

PAC 275. VOLLEYBALL III. (1 Credit)
Skill refinement and development; intense, highly competitive drills and game situations, doubles through sixes play.
This course is repeatable for 11 credits.
Recommended: Volleyball II or varsity-level experience

PAC 278. FITNESS WALKING. (1 Credit)
Establishment of personal fitness programs through walking with emphasis on technique and aerobic components.
This course is repeatable for 11 credits.
PAC 282. WATER POLO. (1 Credit)
Team game, played in deep water; instruction in skills, drills, strategies, techniques; game play; knowledge of rules and terminology. 
This course is repeatable for 11 credits.
Recommended: Swim I skills.

PAC 286. WEIGHT TRAINING: CIRCUITS. (1 Credit)
Fast-paced fitness class using stations of resistance training exercises. Designed to improve cardiovascular fitness and muscular endurance more than strength.
This course is repeatable for 11 credits.

PAC 287. WEIGHT TRAINING I. (1 Credit)
Exercise techniques in both free and fixed resistance training equipment; safety procedures, terminology, and principles of exercise.
This course is repeatable for 11 credits.

PAC 288. WEIGHT TRAINING II. (1 Credit)
Intermediate level of weight training in free and fixed weights.
Prerequisites: PAC 287 with C+ or better
This course is repeatable for 11 credits.

PAC 289. YOGA I. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Equivalent to: PAC 293H
This course is repeatable for 11 credits.

PAC 290. YOGA II. (1 Credit)
Expands on knowledge and skills learned in Yoga I or Fitness Yoga through three to five class sessions, each 3-6 hours; longer sessions provide students with an intensive mental and physical experience centering on the concepts of yoga; includes introductory relaxation and meditation skills.
This course is repeatable for 11 credits.
Recommended: PAC 294 and PAC 295 and PAC 296 and (Yoga I or Fitness Yoga)

PAC 292. WRESTLING. (1 Credit)
Collegiate wrestling fall and winter terms; freestyle and Greco wrestling spring term. All levels.
This course is repeatable for 11 credits.

PAC 293. INTERDISCIPLINARY YOGA. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAC 293
This course is repeatable for 11 credits.

PAC 294. YOGA I. (1 Credit)
Principles and practice of basic yoga postures, techniques of posture alignment, yogi breathing styles and their impact on the body and mind. Students will be exposed to a variety of forms of yoga, as well as basic yoga philosophy.
This course is repeatable for 11 credits.

PAC 295. YOGA II. (1 Credit)
Building off Yoga I, this is an intermediate level course meant to develop a deeper understanding of yoga practice.
Equivalent to: PAC 256
This course is repeatable for 11 credits.
Recommended: Yoga I or previous yoga experience.

PAC 296. VINYASA YOGA. (1 Credit)
Dynamic flow that connects movement and breath encouraging meditation in motion. May include sustained yoga postures.
Equivalent to: PAC 257
This course is repeatable for 11 credits.
Recommended: Yoga I or previous yoga experience

PAC 297. YOGATHON. (1 Credit)
Provides basic front-country camping skills such as packing, trip planning, how to dress for different climates/weather, storm-proofing, knife and axe techniques and safety, stove and kitchen operations, and fire building. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.
PAC 304. ALI: BACKPACKING. (1 Credit)
Hiking and camping while carrying all gear; tent set-up, camp site selection, operation of single-burner stoves, loading a backpack, water infiltration, navigation, proper hiking technique, energy conservation; leave-no-trace principles in every aspect of the trip and class; includes classroom instruction and required overnight trip. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 307. ALI: RAFTING. (1 Credit)
An introduction to white water rafting. Students will learn the fundamentals of safe rafting, trip planning and become familiar with the gear associated with rafting. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 308. ALI: CANOEING. (1 Credit)
Designed as an introduction to canoeing. Students learn the fundamentals of safe canoeing, trip planning and become familiar with the gear associated with rafting. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 311. ALI: STAND UP PADDLEBOARD. (1 Credit)
Covers the curriculum for level 1 and 2 American Canoe Association standup paddle board skill courses. Skills include equipment, environmental factors, techniques, preparation and planning, emergency management, and environmental ethics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 313. ALI: CANYONEERING. (1 Credit)
Students will learn the fundamentals of canyoneering, including efficient hiking techniques, safe anchoring, belaying and rappelling techniques, and environmental mitigation skills. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 314. ALI: BOULDERING. (1 Credit)
Introduction to the sport of bouldering, a subset of rock climbing using an indoor climbing facility; emphasis on safety, spotting, climbing movement, training techniques and improvement; provides activities that promote muscular strength and endurance, flexibility, and cardiovascular endurance. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 315. ALI: ROCK CLIMBING I. (1 Credit)
Physical conditioning for, and instruction in, the skills and techniques of rock climbing; environmental impact issues; held at on-campus indoor climbing center. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 316. ALI: ROCK CLIMBING II. (1 Credit)
Focuses on developing technical climbing skills related to lead climbing and anchor construction. Includes a one-day outdoor experience. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 315 with C- or better
This course is repeatable for 11 credits.

PAC 317. ALI: ROCK CLIMBING III. (1 Credit)
Focuses on developing technical climbing skills in an outdoor setting. Includes a weekend long outdoor experience and cover skills ranging from building anchors using natural protection, to advanced outdoor movement skills. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 315 with C- or better and PAC 316 [C-]
This course is repeatable for 11 credits.
Recommended: Intermediate to advanced skills in an activity area

PAC 319. ALI: TECHNICAL RAPPELLING. (1 Credit)
Students will learn, practice and hone their skills in the art of technical rappelling. Introduces many different styles, techniques and equipment used for rappelling in a variety of situations. Throughout the course, students will be provided with simple to advanced challenges to overcome. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 320. ALI: MOUNTAINEERING I. (1 Credit)
Snow climbing techniques, anchoring, belaying and rappelling techniques, snow camping/living skills, and wilderness ethics; classroom instruction and required overnight alpine trip. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 321. ALI: MOUNTAINEERING II. (1 Credit)
Building on skills learned in Mountaineering I; rope team/glacier travel techniques, crevasse rescue, advanced snow climbing techniques, safe anchoring, belaying and rappelling techniques, snow camping/living skills, and wilderness ethics. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 320 with C- or better
This course is repeatable for 11 credits.

PAC 322. ALI: ICE CLIMBING. (1 Credit)
Students will learn the fundamentals of ice climbing, including efficient ice climbing techniques, safe anchoring, belaying and rappelling techniques and wilderness ethics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 323. ALI: MOUNTAIN RESCUE BASICS. (1 Credit)
Focuses on developing technical skills in a mountain rescue system. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 320 with D- or better
This course is repeatable for 11 credits.

PAC 324. ALI: WHITE WATER RESCUE. (1 Credit)
Provides an introduction to white water rescue; students learn the fundamentals of white water rescue, scene management, and the necessary gear to perform rescues. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 325. ALI: WILDERNESS FIRST AID. (1 Credit)
Fundamentals of emergency care in a non-urban environment including anatomy, physiology, injury assessment, short-term care, small-group rescues; backcountry emphasis with long-term care and evacuation complications. PAC courses may not be used to fulfill upper-division requirements.
Equivalent to: PAC 325H
This course is repeatable for 11 credits.
PAC 325H. ALI: WILDERNESS FIRST AID. (1 Credit)
Fundamentals of emergency care in a non-urban environment including anatomy, physiology, injury assessment, short-term care, small-group rescues; backcountry emphasis with long-term care and evacuation complications. PAC courses may not be used to fulfill upper-division requirements.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAC 325
This course is repeatable for 11 credits.

PAC 326. ALI: BUSH CRAFT. (1 Credit)
Basic wilderness living techniques, knowledge and skills needed for a student to be ethical and efficient, and have the ability to survive in the outdoors. Special emphasis is placed on building shelters, water purification, navigation, awareness, fire, self-sufficiency and caring for groups in the wilderness. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 303 with D- or better
This course is repeatable for 11 credits.

PAC 327. ALI: ROCK GUIDE SCHOOL. (1 Credit)
Serves as an opportunity to learn the skills for being a rock guide for the ALI. With five days of training and practice in the field at two climbing sites in Oregon, it helps to teach students understand the unique challenges of instructing climbing in the outdoor environment. This course may end with Sport Climbing Instructor certification through the Professional Climbing Instructors of America. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.
Recommended: Efficient climbers toolbox, self-rescue, climbing wall instructor–lead certification

PAC 328. ALI: RAFT GUIDE SCHOOL. (1 Credit)
Provides students the skills and guided practice time needed to become competent paddle raft guides. It is a nine-day course that focuses on the development of water reading, raft maneuvering, risk management, and whitewater rescue skills needed by raft guides. Successful completion of the course will result in a certificate of completion from the American Canoe Association (ACA). PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 329. ALI: WILDERNESS FIRST RESPONDER. (2 Credits)
Fundamentals of emergency care in a non-urban environment, including physiology, injury assessment, short-term care, anatomy, and small-group rescues. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 330. ALI: SNOW TRAVEL AND CAMPING. (1 Credit)
An introduction to traveling in the backcountry in adverse weather conditions that often accompany winter. Topics covered include cross country touring, snow shoeing, winter camping techniques, and winter safety considerations including introducing avalanche safety. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 331. THE ART OF FLY FISHING. (1 Credit)
Students will be introduced to fly fishing skills such as casting, knot tying, safety considerations, fly selection, and ways to approach water. There will be a general overview of common places and species to fish in Oregon and other locations. This course combines approximately 30 hours of instruction, online activities, and assignments for 1 credit. PAC courses may not be used to fulfill upper-division requirements.
Corequisites: ENG 225, FW 112
This course is repeatable for 11 credits.

PAC 332. ALI: AVALANCHE AWARENESS. (1 Credit)
Focuses on what causes avalanches, how to safely travel in avalanche terrain, and resources to pursue in understanding the avalanche risk where you are traveling. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

Physical Therapy/Therapist

PT 700. PROFESSIONALISM AND INTERPROFESSIONAL PRACTICE. (2 Credits)
Introduction to the role of the professional in physical therapy practice. Topics of application include communication, professional behavior and abilities, ethics, legal issues, and responsibility for professional development.

PT 711. ANALYTICAL ANATOMY AND IMAGING. (4 Credits)
Detailed kinesiologic analysis of appendicular, spine, head, neck, and face muscles. Lecture, clinical demonstration, and practical experiences.

PT 712. NEUROANATOMY AND NEUROSCIENCE. (5 Credits)
Organized approach to structures in the brain, spinal cord and peripheral nervous systems. Detailed analysis of Neurophysiologic mechanisms underlying normal and abnormal motor sensory function.

PT 713. MUSCULOSKELETAL ANATOMY. (6 Credits)
Musculoskeletal anatomy, innervation, blood supply, and function: intensive study of the head, neck, trunk, and limbs.

PT 716. CULTURAL COMPETENCE IN PHYSICAL THERAPY. (2 Credits)
An exploration of how cultural competence is a critical core component of professional practice in physical therapy and should be considered as a part of the best practice in providing physical therapy care.

PT 717. GERIATRICS IN PHYSICAL THERAPY. (2 Credits)
An overview of the Physical and Psycho-Behavior aspects of aging in adulthood. An introduction to usual and pathological changes and treatment issues relevant to older patients.

PT 718. PSYCHOSOCIAL ASPECTS OF DISABILITY. (2 Credits)
A study of behavior, social structures and beliefs, and interaction patterns to support the scientific basis of the effective interactions of physical therapists with patients.

PT 719. PHYSICAL THERAPY IN RURAL COMMUNITIES. (2 Credits)
An overview of major issues in the rural health care system and the environment in which physical therapists, as rural health clinicians, must function. Provides students with an understanding of the healthcare delivery system in rural America with a concentration on the diverse populations of the Northwest region of the United States.

PT 720. MOTOR DEVELOPMENT. (3 Credits)
Examination of normal development of gross motor, fine motor, language, cognition, psychosocial, and play skills across the lifespan from in utero to young adulthood.
PT 721. MOTOR CONTROL AND LEARNING ACROSS THE LIFE SPAN. (4 Credits)
Introduction to sensorimotor systems, overview of current perspectives in motor control and learning from fetus through late adulthood, and clinical tests of motor proficiency.

PT 722. PREVENTION WELLNESS AND POPULATION HEALTH. (3 Credits)
A study of the development of wellness plans for individuals or families in the community. Students will learn to assess family health care needs, seek out community resources, and educate community members on specific issues related to their own health and well-being.

PT 730. APPLIED PHYSIOLOGY. (3 Credits)
Selected subjects in cellular and systems physiology. Emphasis on molecular and cellular aspects of neuromuscular function, also renal and endocrine physiology.

PT 731. CLINICAL EXERCISE PHYSIOLOGY. (4 Credits)
Adaptation of the human body to exercise and the use of exercise to modify human function.

PT 740. THERAPEUTIC EXERCISE I. (3 Credits)
Theoretical principles for evaluation of exercise need and prescription of exercise programs. Emphasis on approaches for patients with musculoskeletal deficits.

PT 741. THERAPEUTIC EXERCISE II. (3 Credits)
Examination of needs analysis and prescription of exercise programs for special patient populations and assessment of current community trends in exercise and wellness.

PT 743. BUSINESS AND ADMINISTRATION IN PHYSICAL THERAPY. (3 Credits)
Examination on the factors affecting patients entry into and progression through the healthcare system, including the effect of current financial, legal and regulatory policies that affect the patient, the patient/professional relationship, and the practice of physical therapy. Provides an overview of primary business disciplines including market research and strategy, marketing, finance, operations, and management.

PT 745. BASICS OF PATIENT MANAGEMENT. (1.6 Credits)
Development of basic decision-making skills, professional behaviors and impairment assessment in patients with musculoskeletal, neurologic and/or cardiopulmonary dysfunction.
This course is repeatable for 6 credits.

PT 746. DISORDERS OF THE MUSCULOSKELETAL SYSTEM. (3 Credits)
Regional description of pathology and pathophysiological mechanisms of disorders of bone, connective tissue, and joints.

PT 748. THERAPEUTIC MODALITIES. (3 Credits)
An introduction to the management of pain and dysfunction using thermal, electrical and mechanical modalities used by Physical Therapists in general practice.

PT 750. CLINICAL BIOMECHANICS & GAIT. (5 Credits)
Introduction to the principles of biomechanics as they apply to physical therapy practice. Emphasis on joint structure and function and tissue mechanics. Introduction to both normal and pathological gait including examination of joint kinematics, kinetics, and muscle activity.

PT 752. PROSTHETICS AND ORTHOTICS. (3 Credits)
The examination of pathological gait of patients using prosthetic and orthotic devices. The course emphasizes types of orthotic and prosthetic devices, assessments, reassessment and corrections of gait deviations using therapeutic interventions geared toward functional interventions, patient/family education, exercises, and balance and coordination techniques.

PT 760. PHARMACOLOGY. (2 Credits)
The study of prescription and/or over-the-counter medications used in the management of a variety of patient conditions encountered during physical therapy management.

PT 761. RESEARCH METHODS AND EVIDENCE BASED PRACTICE. (2 Credits)
Introduction to evidence based practice, scientific methods, and clinical research methodologies.

PT 780. DIFFERENTIAL DIAGNOSIS. (4 Credits)
Consideration of principles of differential diagnosis with emphasis on mastering this skill.

PT 791. MANAGEMENT OF CARDIOPULMONARY DYSFUNCTION. (2 Credits)
Physical therapy evaluation and intervention in the care of patients with circulatory, cardiac, or pulmonary dysfunction.

Public Health
See also Health and Human Sciences (HHS) for additional Public Health courses.

H 100. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.
Equivalent to: H 100H

H 100H. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 100

H 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

H 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 210. INTRODUCTION TO THE HEALTH CARE SYSTEM. (3 Credits)
Provides tools to understand and critically assess the health care delivery system, its components, and the challenges created by its structure. The health care system will be considered from the perspective of several main players [e.g., patients, hospitals, doctors, health plans]. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 220. INTRODUCTION TO HEALTH DATA ANALYSIS. (3 Credits)
Introduction to the application of biostatistics and probability to the health sciences. Topics include quantitative analysis and inference, statistical methods in the biosciences, and quantitative study to evaluate and control health problems.
Recommended: MTH 105 or MTH 111 or higher mathematics.
**H 225. **SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS. (4 Credits)
Overview of the macro (social/system/environmental) and micro (individual) contributors to premature disease, disability and population health. Selected behavioral theories supporting health risks and strategies for the prevention of premature disease/disability and the promotion of health. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

**H 250. **INTRODUCTION TO HEALTH CARE MANAGEMENT. (3 Credits)
Participants will learn key principles, practices and personalities of health care management. The content is broadly applicable to health care enterprises of every kind: public health organizations, physician practices and clinics, hospitals and health systems, agencies and service organizations, for-profit firms, not-for-profit enterprises, etc.
Prerequisites: H 210 (may be taken concurrently) with C- or better

**H 309. **PRACTICUM IN HEALTH CARE SERVICES. (3-6 Credits)
Supervised work experience in a health care service setting or health-related agency or program. Weekly progress reports and post-experience summary report and evaluation will be expected. Preplanned with instructor approval. Open to health care administration majors. Graded P/N.
This course is repeatable for 12 credits.

**H 310. **HEALTH FIELD EXPERIENCES. (3-6 Credits)
Introductory field experience in a health or health-related worksite.
Graded P/N.
Prerequisites: H 210 with C- or better
This course is repeatable for 12 credits.

**H 312. **HIV/AIDS AND STIS IN MODERN SOCIETY. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of AIDS and other sexually transmitted diseases in contemporary society; emphasis on social, psychological, legal, economic, and ethical issues surrounding these diseases. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: H 312H

**H 319. **INTRODUCTION TO HEALTH POLICY. (3 Credits)
Describe the policy development process, including problem conceptualization, agenda setting, role of interest groups and public opinion, analysis of alternatives and selection of policy alternative.
Prerequisites: H 210 with C- or better and PS 201 [C-]

**H 320. **INTRODUCTION TO HUMAN DISEASE. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of communicable and noncommunicable diseases in human populations. Special emphasis on disease prevention and health promotion in the high risk diseases of modern, industrialized society.

**H 333. **GLOBAL PUBLIC HEALTH. (3 Credits)
Introduction to the field of global health, its history, methods, and key principle; understanding global health inequities through case studies; overview of major global health prevention programs. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

**H 344. **FOUNDATIONS OF ENVIRONMENTAL HEALTH. (3 Credits)
Introductory course examining environmentally-linked disease, and health effects associated with toxic substances, food quality, pesticides, air, water, and noise pollution, and solid/hazardous wastes.

**H 349. **PEER HELPER SKILLS DEVELOPMENT. (3 Credits)
Prepares the student for an active role as a peer helper in alcohol and drug abuse prevention and health education. Course work will include: drug, alcohol, addiction and other related health issues, basic listening and communication skills, conflict resolution, crisis recognition and referral. A major component will be affective learning situations designed to promote self-awareness and personal growth.

**H 364. **DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation, decision-making, and self-responsibility in treatment and educational approaches to prevention.
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364H

**H 364H. **DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation.
Attributes: HNRS – Honors Course Designator
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364

**H 376. **EVIDENCE-BASED HEALTH PROMOTION. (3 Credits)
Future health professionals will learn what makes a successful health promotion program. Students will lean about research-tested programs that are effective for promoting health in community, clinical, and educational settings. Students will begin to develop the skills needed to critically examine evidence in the field and select programs to address current public health issues.
Prerequisites: H 100 with C- or better and H 225 [C-]

**H 385. **SAFETY AND HEALTH STANDARDS AND LAWS. (3 Credits)
Emphasis on the Occupational Safety and Health Act; study includes the scope and duties under the act, enforcement, and adjudication procedures and OSHA litigation; components of Oregon-OSHA.

**H 388. **GLOBAL ENVIRONMENTAL HEALTH. (3 Credits)
An overview of global environmental issues, including climate change, air pollution, water, e-waste, and metals, and their impacts on human health. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

**H 399. **SPECIAL TOPICS. (1-16 Credits)
Equivalent to: H 399H
This course is repeatable for 16 credits.

**H 399H. **SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: H 399
This course is repeatable for 16 credits.

**H 401. **RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

**H 402. **INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

**H 403. **THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

**H 405. **READNG AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
H 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 407. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world.
Equivalent to: H 407H
Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option

H 407H. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 407
Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option

H 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 409. PRACTICUM. (1-6 Credits)
Supervised work experience in a public health or health care administration setting. Open to majors in public health. Graded P/N. This course is repeatable for 16 credits.

H 410. INTERNSHIP. (1-12 Credits)
Directed field experience with participation in a community, worksite, or health agency program. Experience is individually arranged to meet student needs. Graded P/N.
Prerequisites: H 407 with C- or better
This course is repeatable for 24 credits.
Recommended: H 436 (for HMP students). H 225 and H 320 and H 476 (for HPHB students)

H 418. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Current ethical issues in public health, including gender and ethnicity in employment, pharmaceutical controls, product liability, advertising, and export of high technology.

H 421. MENTAL HEALTH. (3 Credits)
Examination of social, governmental, legal and individual mental health issues. Brief overview of some major mental disorders.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 422. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging.
Recommended: 9 credits of health course work.

H 425. FOUNDATIONS OF EPIDEMIOLOGY. (3 Credits)
Measures of disease frequency; measures of effect; association and causation; sources of inaccuracy; experimental and observational study designs. Lec/rec.
Prerequisites: H 220 with C- or better or ST 201 with C- or better or ST 314 with C- or better or ST 351 with C- or better

H 431. HEALTH CARE MARKETING. (3 Credits)
Principles, elements and methods of marketing health care services. Role of the consumer, governing body, administration and medical staff as well as impact of professional ethics.

H 432. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economic principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.
Prerequisites: (ECON 201 with C- or better or ECON 201H with C- or better) and H 210 [C-]

H 434. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 210 with C or better and H 250 [C-] and WR 222 [C-]

H 436. ADVANCED TOPICS IN HEALTH CARE MANAGEMENT. (3 Credits)
Covers how health services are governed and organized; how health care organizations assess and adapt to change; constraints/opportunities in shaping organizational performance; leadership; strategic decision-making and the use of evidence-based management in health care.
Prerequisites: H 210 with C- or better and H 250 [C-]

H 445. OCCUPATIONAL HEALTH. (3 Credits)
Current and historical topics in the area of occupational health, with particular emphasis on the types of materials that produce human health effects; clinical and epidemiologic data used to assess the public health importance of occupational pollutants and to evaluate control strategies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

H 448. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Prerequisites: H 344 with C- or better
Recommended: One term of basic chemistry

H 449. MASS MEDIA AND HEALTH. (3 Credits)
Designed to examine the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public-health campaigns.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 457. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Prerequisites: BA 215 with C- or better and H 210 [C-] and H 250 [C-]

H 458. REIMBURSEMENT MECHANISMS. (3 Credits)
Introduces and analyzes the different types of healthcare reimbursement methodologies used in the U.S. health care system.
Prerequisites: H 210 with C- or better

H 461. SEXUALITY: A HEALTH SCIENCE PERSPECTIVE. (3 Credits)
Exploration of the meaning of sexuality from a variety of contemporary health science perspectives; aspects of sex and sexuality fundamental to total health; issues central to the health educator role examined.
H 465. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women's health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Recommended: 6 credits in public health.

H 467. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 468. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 474. PUBLIC HEALTH AND VIOLENCE IN SOCIETY. (3 Credits)
Examination of violence as a major public health issue. Historical, social, environmental, economic, behavioral and psychological aspects of assaultive violence, spousal abuse, rape and sexual assault, child abuse, child sexual abuse, suicide, the effects of the media on violence, drug abuse and violence, and related public health problems in contemporary American society. Emphasis on health and the efficacy of current efforts aimed at ameliorating these problems and potential for alternative public health models for prevention and intervention.

H 476. PLANNING AND EVALUATING HEALTH PROMOTION PROGRAMS. (4 Credits)
A systematic approach to planning, implementing and evaluating health promotion programs in a variety of health related settings. Students will be writing a series of drafts to effectively develop a health promotion program plan. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 225 with C- or better and H 320 [C-]

H 477. DIETARY INTERVENTIONS FOR PUBLIC HEALTH. (3 Credits)
A public health perspective on the practice of population-based dietary intervention. Examination of relevant theories, research, and practice that pertain to health promoters/educators.
Prerequisites: NUTR 225 with C- or better
Equivalent to: NUTR 477

H 480. UNDERGRADUATE EOH SEMINAR. (1 Credit)
Explores current topics in environmental health and safety. EOH faculty will discuss their current research interests; EOH graduate student speakers will share their environmental health and safety internship experiences. Documentaries will be viewed to introduce topics of discussion. Features will be discussions relating directly to ongoing, current environmental/occupational health crises, both in the United States and around the world. Graded P/N.
This course is repeatable for 2 credits.

H 489. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.
H 513. INTEGRATED APPROACH TO PUBLIC HEALTH. (12 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health.

H 514. ENVIRONMENT, SAFETY AND HEALTH SEMINAR. (1 Credit)
One-credit graduate seminar on current topics of interest and importance to the environmental health and occupational safety field. Critical reading of research publications, discussion of controversial issues facing ESH professionals, and/or presentation of current ESH research.

This course is repeatable for 3 credits.

H 515. RESEARCH METHODS IN SOCIAL AND BEHAVIORAL HEALTH SCIENCES. (3 Credits)
Provides an introduction to quantitative research methods and design. Topics include definition of research problems and questions, hypothesis generation, research design, sampling, variable definition and measurement, data collection, and ethical considerations. Also provides a brief introduction to qualitative and mixed methods.

H 516. RESEARCH METHODS IN GLOBAL HEALTH. (3 Credits)
Overview of research methods used to understand health, illness, health care, and health-seeking behavior in international settings. Special emphasis on the use of qualitative and mixed methods in international health research.

H 518. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Explores key ethical issues in the context of public health practice; codes and guidelines for ethical conduct of public health practice; issues related to social accountability, vulnerable populations, and ethical framework for community engagement.

H 519. DISPLACEMENT, MIGRATION, AND GLOBAL HEALTH. (3 Credits)
Critical examination of health of displaced/migrant populations with an emphasis on health disparities and social determinants. Understanding intersections of humanitarianism, migration, vulnerability, and displacement from a global health perspective.

H 520. HEALTH DISPARITIES. (3 Credits)
Health disparities based on race/ethnicity, culture, social class, and rural/urban residence, among others; strategies to reduce disparities, promote health, and prevent disease in diverse populations.

H 521. MENTAL HEALTH. (3 Credits)
Focus upon mental health policy development, in relation to federal and state government services and regulations, implementation of services.

H 522. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging.

Recommended: 9 credits of public health course work.

H 523. FOUNDATIONS OF PUBLIC HEALTH. (4 Credits)
Fundamental principles, concepts and tools used in public health to promote the health of populations. Using a combination of case study method, lecture and discussion, students will develop a broad understanding of public health and recognition of how discipline-specializations address the social, behavioral and environmental determinants of public health.

H 524. INTRODUCTION TO BIOSTATISTICS. (4 Credits)
Quantitative analysis and interpretation of health data including probability distributions, estimation of effects, and hypothesis-tests such as Chi-square, one-way ANOVA, and simple linear regression.

H 525. EPIDEMIOLOGICAL METHODS I. (3 Credits)
Introduction to the concepts and methods of epidemiology. Topics include measures of population health, screening, study design, measures of association, and interpretation of epidemiological data.

Prerequisites: H 513 with B- or better or HHS 514 with B- or better.

H 526. EPIDEMIOLOGIC METHODS II. (3 Credits)
Concepts and methods of epidemiological analysis; standardization; stratified analysis; confounding and its control; planning and conducting epidemiologic research; role of multivariate analysis in epidemiologic research.

Prerequisites: H 524 with B- or better and H 525 [B-]

H 527. CRITICAL ASSESSMENT OF INTERNATIONAL HEALTH PROGRAMS. (3 Credits)
Introduces the critical evaluation framework of assessing international health development programs, based on self-determination and community ownership principles. The framework of assessment method includes three levels: upstream evaluation, midstream evaluation, and downstream evaluation.

Recommended: H 528 and H 529

H 528. GLOBAL HEALTH ISSUES. (3 Credits)
Examines major issues in health developments of global significance, their causes and impacts on international health, and methods and strategies to address them.

H 529. INTERNATIONAL HEALTH. (3 Credits)
Overview of the epidemiological, economic, political, sociological, and cultural factors that impact on international health. Special emphasis on the methods of prevention/intervention utilized in coping with health problems on an international level.

H 530. HEALTH POLICY ANALYSIS AND POLITICS. (3 Credits)
Examination of current health policy issues affecting health care programs, services, and organization as well as the role of politics in public health and health policy. Exploration of processes by which health policy proposals are generated, promoted, defeated, modified and implemented.

Prerequisites: H 513 with B- or better or HH 514 with B- or better.

H 532. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economics principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.

Recommended: ECON 201

H 533. HEALTH SYSTEMS ORGANIZATION. (3 Credits)
Examines the nature of health and health care services and reviews the role of government and the free market on health services. Alternative ways of organizing, financing, and delivery of health care services are explored.

H 534. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access.
H 535. INTERPRETING EPIDEMIOLOGIC EVIDENCE. (3 Credits)
Intended for students in the human sciences and allied health fields. Introduces basic epidemiology concepts. Topics will include measures of disease frequency, assessing population health, causal logic, quantifying associations between exposures and health outcomes, epidemiologic study design, and threats to study validity (random error, bias, confounding). Examples focus on application of epidemiological methods to a variety of health-related fields.

H 536. HEALTHCARE ORGANIZATION LEADERSHIP THEORY AND BEHAVIOR. (3 Credits)
Overview of organization theory and behavior in health care organizations. Emphasis is on developing an understanding of the factors and forces that influence the structures, behaviors, and operations of health care delivery organizations. This understanding will be developed through consideration of organizations, their environments, and the roles of individuals working in management.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 537. INJURY EPIDEMIOLOGY. (3 Credits)
An overview of the distribution and determinants of injuries, methodological issues specific to injury epidemiology, and approaches to injury control.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 513 with B- or better
Recommended: Graduate epidemiology training

H 538. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public and social and commercial health insurance, and their financial reimbursement mechanisms.

H 540. WATER AND HUMAN HEALTH. (3 Credits)
Critically examine the complex relationship between water quality, human activities, and population health.

H 541. AIR QUALITY AND HUMAN HEALTH. (3 Credits)
Examination of the major sources of air pollution, its impact on ecosystems and climate change, and population health. Will also discuss technologies and introduce regulations that are used to control air pollutants.

H 542. ENVIRONMENTAL AND OCCUPATIONAL HEALTH RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern environmental and occupational risk analysis and how they are utilized to make evidence-based decisions by regulatory agencies.

H 543. EXPOSURE SCIENCE I. (4 Credits)
Overview of the concepts, principles and practices in modern environmental and occupational exposure assessment. Exposure Science I provides a broad introduction to environmental and occupational exposure assessment methods, while Exposure Science II focuses on sampling and measurement methods.

H 544. ENVIRONMENTAL AND OCCUPATIONAL EPIDEMIOLOGY. (3 Credits)
Examines exposure assessment methodology and epidemiological study designs that are commonly used in environmental and occupational health science in order to characterize the impact of environmental and occupational exposures on population health.
Prerequisites: H 525 with C or better
Recommended: Graduate level statistics course

H 545. ENVIRONMENTAL AND HUMAN HEALTH. (3 Credits)
Focus on physical agents (heat, noise, vibration, radiation) and health risks associated with these agents. It covers the range and sources of exposure to physical agents, methods of characterizing these exposures, effects on human health, and the regulations/standards that set limits for physical agents. Lec/lab.

H 546. PHYSICAL AGENTS AND HUMAN HEALTH. (3 Credits)
Focus on physical agents (heat, noise, vibration, radiation) and health risks associated with these agents. It covers the range and sources of exposure to physical agents, methods of characterizing these exposures, effects on human health, and the regulations/standards that set limits for physical agents. Lec/lab.

H 547. GIS AND PUBLIC HEALTH. (4 Credits)
Applications of geographic information systems (GIS) to public health are reviewed, including mapping, spatial analysis methods, estimating access, and exposure assessment. This course is geared toward individuals involved in public health who have no (or introductory level) knowledge of GIS. Lec/lab.

H 548. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Recommended: H 344 with a grade of C- or better and one term of basic chemistry.

H 549. MASS MEDIA AND HEALTH. (3 Credits)
Examines the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public health campaigns.
Prerequisites: H 571 with C or better

H 550. SOCIAL EPIDEMIOLOGY. (3 Credits)
Explores the social determinants of health at the population level. Primary focus is on introduction to methods specific to social epidemiology, but will also provide an overview of current understanding of the empirical associations between social factors and health.
Prerequisites: H 525 with B or better
Recommended: Introductory course in epidemiology

H 551. APPLIED EPIDEMIOLOGICAL ANALYSIS OF SECONDARY DATA. (3 Credits)
Practical experience performing a hypothesis-driven epidemiological analysis utilizing secondary surveillance or other appropriate data set, writing an analytical plan, appropriate programming for the analysis (using STATA or SAS), understanding the analysis output, preparing tables, and interpreting results.
Prerequisites: H 526 with B- or better and H 560 [B-] and H 580 [B-]

H 552. DISASTER EPIDEMIOLOGY. (3 Credits)
Describe the impact of natural and manmade disasters on human health, understand epidemiologic methods specific to disasters, and apply fundamental epidemiologic methods to identify and characterize disaster-related adverse health outcomes.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 553. EPIDEMIOLOGY OF AGING. (3 Credits)
An overview of the core principles of the epidemiology of aging is provided. There will be an emphasis on health and disease processes in older adults. Students will learn essential study design and analytic issues that may arise in studies of aging.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 554. EPIDEMIOLOGY OF AGING. (3 Credits)
Introduction to basic concepts and methodology in cancer epidemiology.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
H 556. STRATEGIC MANAGEMENT OF HEALTH SERVICE ORGANIZATIONS. (3 Credits)
Theories and methodologies of long-range planning and strategic management in health care organizations.

H 557. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Recommended: H 210 and H 250

H 558. REIMBURSEMENT MECHANISMS. (3 Credits)
Techniques used in cost-effectiveness analysis. Examples are drawn from the public health and health economics literature.

H 560. PUBLIC HEALTH SURVEILLANCE. (3 Credits)
An introduction to public health surveillance systems (national and international) for chronic and infectious diseases. Utility of existing surveillance systems for secondary epidemiological data analysis.
Prerequisites: H 524 with B- or better and H 525 [B-]

H 562. INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Understand epidemiologic methods specific to infectious diseases, apply fundamental epidemiologic methods to infectious disease questions, and describe the broad trends in global infectious disease burden. The application methods and principles will be explored through lectures, discussions, assignments and writing projects.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or H 514 with B- or better

H 563. PHYSICAL ACTIVITY EPIDEMIOLOGY. (3 Credits)
Physical activity epidemiology will focus on current research, controversial issues, and methodological problems in the epidemiology of physical activity, exercise, and health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 564. COMPUTING TOOLS AND HEALTH DATA ANALYSIS. (3 Credits)
Modern computational biostatistics for analyzing health data, emphasizing important technologies and methods for data processing and understanding of how they work. Topics will evolve over time as new procedures are developed.
Corequisites: H 524

H 565. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women's health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability.
Equivalent to: BA 565
Recommended: 6 credits in public health.

H 566. DATA MINING IN PUBLIC HEALTH. (3 Credits)
An introduction to high-dimensional data analysis and data mining techniques used as an information technology tool to extract previously unknown and potentially useful information from large databases in biology, medicine, and public health.
Recommended: H 581 and H 564

H 567. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 568. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 569. MATERNAL AND CHILD HEALTH. (3 Credits)
Women's reproductive health and health of children stressing causation, management, and prevention of public health problems. Epidemiological analysis of morbidity and mortality in children and women of childbearing age; impact of social, political and economic influences on the health of women and children; comparison of issues and problems of industrialized versus developing nations. Consideration of health issues of interest to the many diverse racial and ethnic groups of women and children in the U.S. as well as the global village.

H 571. PRINCIPLES OF HEALTH BEHAVIOR. (3 Credits)
Theoretical approaches to behavior change in health promotion/education research and practice; factors influencing health behaviors, ethical behavior change issues, behavioral interventions for special populations.

H 572. COMMUNITY ORGANIZATION FOR HEALTH PROMOTION AND EDUCATION. (3 Credits)
History, theory, and practice of community organizing for health advocacy; focus on group processes, use of media, leadership, coalitions, grass roots methods and social change.

H 573. INTRODUCTION TO MULTILEVEL/HIERARCHICAL MODELS. (3 Credits)
Introduction to the theory and application of hierarchical models to problems in epidemiology and public health. Hierarchical models will be dealt with using both frequentist and Bayesian frameworks.
Recommended: H 581

H 575. EVALUATION OF HEALTH PROMOTION AND EDUCATION PROGRAMS. (3 Credits)
Provides theoretical and practical bases for program evaluation. Develops basic skills in a variety of approaches to evaluation, including techniques that are particularly suitable for evaluating health promotion, community health improvement, and related health and social services programs. Course learning is synthesized through designing an evaluation framework and methodology for a relevant program.
Prerequisites: H 513 with B- or better or H 515 with B- or better or HHS 514 with B- or better

H 576. PROGRAM PLANNING FOR HEALTH/HUMAN SERVICES. (4 Credits)
Provides students with an introduction to the principles of program planning and the development of program plans, with a focus on evidence-based public health/human services. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a program plan.
Prerequisites: (H 515 with C- or better or HHS 514 with C- or better) and H 571 [C-] and H 575 [C-]

H 578. INTRODUCTION TO MOLECULAR EPIDEMIOLOGY I. (3 Credits)
A survey of and introduction to the methods and issues arising in genetics and molecular epidemiology, including key biostatistical methods, study designs, and technologies used in the conduct of these studies. Students will gain experience conducting critical reviews of research papers with respect to study design and biostatistical analysis.
Prerequisites: (H 524 with C or better and H 526 [C])
Recommended: Knowledge of and familiarity with basic concepts of molecular biology (DNA replication, transcription, and translation)
H 580. LINEAR REGRESSION AND ANALYSIS OF TIME TO EVENT DATA. (4 Credits)
Multiple linear regression analysis for measurement data and survival analysis methods for time to event health data, including modes of inference, diagnostics, model selection, and reporting conclusions. Lec/lab.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 581. GENERALIZED LINEAR MODELS AND CATEGORICAL DATA ANALYSIS. (4 Credits)
Biostatistical methods focusing on binary and count data will provide a foundation for understanding and implementing generalized linear regression and categorical data models that are commonly used to analyze epidemiological and public health data from cohort, case-control, and clinical trial study designs. Lec/lab.
Recommended: H 580

H 582. ANALYSIS OF CORRELATED HEALTH DATA. (3 Credits)
Biostatistical methods for clustered, repeated measures, and longitudinal correlated health data, with an introduction to applications of linear and generalized linear mixed models and generalized estimating equations.
Prerequisites: H 581 with C or better

H 583. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT. (4 Credits)
Studies the design and management principles and practices in the environment, safety and health field.

H 584. ANALYSIS OF INTERVENTION STUDIES AND CLINICAL TRIALS. (3 Credits)
Principles of data analysis from intervention studies and clinical trials, including professional graphical and tabular presentation, reproducibility and reliability of measurements, and controlling the Type I error rate when analyzing multiple endpoints. Basic principles of designing experiments are also covered including blocking, stratification, interaction, and control of variability.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 585. ENVIRONMENT, SAFETY AND HEALTH POLICY AND LAW. (3 Credits)
Survey of the environment, safety and health policy and law in the United States. Furnishes the basic knowledge and general understanding about policy and law-related issues important to all environmental health and safety professionals.
Recommended: H 385

H 586. BAYESIAN BIOSTATISTICS IN PUBLIC HEALTH. (3 Credits)
An examination of methods for designing and implementing Bayesian analysis to address scientific questions through hands-on experience with health data. This survey course also covers proper interpretation and communication of results from practical Bayesian methods for biostatistics data analysis, with illustrations of the utility of Bayesian ideas in public health.
Prerequisites: H 581 with C or better

H 587. TIME TO EVENT ANALYSIS OF HEALTH DATA. (3 Credits)
Biostatistical models and methods for survival analysis of time to event data that are routinely encountered in biomedical and health research.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 588. APPLIED OCCUPATIONAL SAFETY AND HEALTH. (3 Credits)
The management and technical aspects of a workplace safety and health program are identified and assessed. Students completing the course receive a 30-hour OSHA General Industry card.

H 589. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.

H 590. OCCUPATIONAL ERGONOMICS AND BIOMECHANICS. (3 Credits)
Examines the advanced theories, applications, and contemporary topics of occupational ergonomics and biomechanics. Topics include muscle physiology, work-related musculoskeletal disorders, assessing biomechanical exposure in the workplace, various material handling assessment tools, 3-Dimensional Static Strength Prediction Program, human vibrations, and implementing ergonomic interventions.

H 591. SELECTED TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.
This course is repeatable for 9 credits.

H 592. SPATIAL EPIDEMIOLOGY. (3 Credits)
An introduction to methods in spatial epidemiology is provided, including spatial exploration of health data, quantifying spatial patterns and clusters, spatial exposure assessment, and explaining patterns and associations.
Prerequisites: H 547 with C or better and H 581 [C]

H 593. REPRODUCTIVE EPIDEMIOLOGY. (3 Credits)
Focuses on current research, controversial issues, and methodological problems in the epidemiology of reproductive health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 594. APPLIED ERGONOMICS. (3 Credits)
Principles of occupational ergonomics for managing optimal worker performance and well-being.

H 595. DESIGN FOR ENVIRONMENT, SAFETY, AND HEALTH. (3 Credits)
Systematic consideration of environmental, safety, and health concerns at the earliest possible stage in the lifecycle design engineering of products, technologies, and manufacturing processes.

H 596. HEALTHCARE EPIDEMIOLOGY. (3 Credits)
Focus on current research, controversial issues, and methodological problems in the epidemiology of healthcare. Topics include institutional infection control, medical errors, screening and diagnostic testing, cost-effectiveness, and others related to the delivery and assessment of healthcare, with a focus on the US healthcare system specifically.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
Recommended: H 524

H 597. METHODS IN FOODBORNE DISEASE OUTBREAK INVESTIGATION. (3 Credits)
Focuses on the practical basis for developing and implementing methods for foodborne disease outbreak detection, investigation and control, using recent outbreaks to highlight underlying principles. Biological characteristics of major foodborne disease pathogens, clinical features of the illnesses its causes and epidemiologic presentations of foodborne outbreaks will be reviewed. The implications of these characteristics will be discussed in a problem solving, interactive format that examines theory and practice in the context of recent outbreaks. Strategies to promote timely decision-making will be emphasized.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
H 598. HEALTH POLICY ANALYSIS METHODS. (3 Credits)
Analysis of public policies affecting health care programs, services and organizations and the impact of those programs on citizens. Health services research methods, including data sources for health policy research and health policy literature.
Prerequisites: H 513 with B- or better and H 533 [B-]

H 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

H 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

H 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

H 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 611. INTRODUCTION TO SYSTEMATIC LITERATURE REVIEWS. (3 Credits)
Students will learn how to apply systematic review methodology to a research question of their choice and understand how literature reviews inform evidence-based decision-making. Examples will focus on applying literature reviews to public health, clinical science, and biomedical research.

H 612. DOCTORAL SEMINAR IN PUBLIC HEALTH: RESEARCH AND PRACTICE. (1 Credit)
Contemporary research and professional issues specific to the discipline of public health. Includes responsible conduct of research, writing for publication, professional development and leadership, and faculty research in public health.
This course is repeatable for 9 credits.

H 613. INDEPENDENT RESEARCH PROJECT. (1-9 Credits)
Independent research project for PhD students, including research design, execution or research, and the formal presentation of findings in written form. Student will develop an original research topic based on knowledge and review of the literature in a public health-relevant area of inquiry. Graded P/N.
This course is repeatable for 9 credits.

H 614. RESEARCH MANUSCRIPT. (4 Credits)
PhD students write a manuscript to submit to a peer-reviewed journal as part of the course requirements. Graded P/N.

H 615. ADVANCED EVALUATION AND RESEARCH DESIGN. (3 Credits)
Provides an in-depth examination of advanced research designs and methods for establishing causal statements about the efficacy, effectiveness and generalizability of public health and social service interventions designed to alter public health and social risk or protective factors.
Recommended: H 515 and H 575

H 620. ADVANCED TOPICS IN GLOBAL HEALTH INTERVENTION AND PRACTICE. (3 Credits)
Examines the processes and tools involved in planning and evaluating culturally competent health and human service prevention and intervention programs in the global context. Special considerations in program decision-making in the global context (community engagement, cultural competence, sustainability, feasibility, political/ethical issues) will be explored. Provides a key forum for doctoral students to share ongoing developments in their research and practice drawing from fieldwork as well as attended conferences and meetings.

H 622. GLOBAL HEALTH SYSTEMS, POLICY AND POLITICS. (3 Credits)
Focuses on learning to identify key stakeholders in the politics of global health, and to be able to describe political and policy processes involved in negotiating global health decisions. Employment of theories and evidence from both the global North and South to explain political processes affecting public health practice and programs.

H 626. GLOBAL HEALTH SYSTEM FINANCE AND STRENGTHENING. (3 Credits)
Introduces an analytical framework of health system finance strengthening for global health, from local community to national level and international level. Develops the analytical skill and knowledge for examining the source and mechanism of financing health systems and identify, mobilize, organize, and manage domestic and global health resources. Provides training to examine equity and efficiency of financial burden in a health system, and the strategies to strengthen it.

H 630. QUANTITATIVE HEALTH POLICY RESEARCH METHODS I. (4 Credits)
Contemporary doctoral-level quantitative health policy/services research methods emphasizing linear regression models, data sources for health policy research, and health policy research literature.
Prerequisites: H 524 with B- or better

H 632. APPLIED HEALTH ECONOMICS. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing causal inference when potential endogeneity is present.
Prerequisites: H 630 with B- or better

H 635. COST EFFECTIVENESS ANALYSIS IN HEALTH AND MEDICAL CARE. (3 Credits)
The primary objective of this course is to introduce students to cost-effectiveness studies in health and medical care. Covers the core concepts of CEA, quality adjusted life years, cost calculations, and decision rules.

H 638. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, their finance mechanisms, and theoretical foundation behind the selection of certain system of health insurance and finance method.
Prerequisites: H 533 with C or better

H 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotion.
Recommended: 9 credits of public health or HDFS graduate coursework
H 642. ENVIRONMENTAL AND REGULATORY RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern risk analysis and how they are utilized to make evidence-based decisions in public health. Focus will be on real world examples of risk assessment by environmental and occupational regulatory agencies.

H 650. REPORTING RESULTS: WRITING FOR EPIDEMIOLOGY. (3 Credits)
Applied experience writing a scientific paper to disseminate results, including deciding on authorship, preparing a lay summary, revising and responding to peer review, and serving as a reviewer.
Prerequisites: H 526 with B- or better and H 551 [B-] and H 580 [B-]

H 651. ADVANCED EPIDEMIOLOGICAL METHODS. (4 Credits)
Covers advanced topics in epidemiology. Course expands on many of the same topics as H 526, and explores them in greater breadth and depth. Topics include causal theory, measures of disease and association, confounding, selection bias, predictive models, directed acyclic graphs, effect modification, mediation, indirect and direct effects, study design, and other contemporary topics.
Prerequisites: H 526 with B- or better and H 581 [B-]

H 652. CAUSAL INFERENCE IN EPIDEMIOLOGY. (3 Credits)
Discussion of the theoretical framework of causal statistics and the development of modern methods including propensity scores and marginal structural models. Focus is on the inverse probability of treatment weighting; discussion of other estimation methods will be included. Additional topics may include longitudinal causal models, causal mediation, instrumental variables, and other contemporary topics. Applied examples will be used for illustration.
Prerequisites: H 651 with B- or better

H 659. QUANTITATIVE HEALTH POLICY RESEARCH METHODS II. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing health care utilization, expenditures, and outcomes data.
Prerequisites: H 630 with B- or better

H 662. ADVANCED METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Covers advanced methods and principles for infectious disease research, including framing infectious disease issues into testable hypotheses, designing epidemiologic studies using appropriate sampling strategies, and identifying strengths and weaknesses of various epidemiologic research methods.
Prerequisites: H 526 with B- or better and H 562 [B-]

H 671. ADVANCED THEORIES OF HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of major theories of health behavior (both health compromising and health enhancing).
Recommended: H 571

H 672. ADVANCED QUALITATIVE METHODS IN HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of the use of qualitative methods in health behavior research and practice.
Recommended: H 515 and SOC 518 and HDFS 538

H 673. MEASUREMENT OF HEALTH BEHAVIOR CONCEPTS. (4 Credits)
Provides in-depth study and field work for graduate students in public health and related fields of the methods used in the conceptualization, development, and evaluation of quantitative measures of health behavior and related concepts.
Recommended: H 524, H 515, and 3 credits in other quantitative research methods or social behavioral methods (eg. sociology or psychology or health promotion or education programs)

H 675. DEVELOPMENT OF HEALTH BEHAVIOR INTERVENTIONS. (3 Credits)
Examines the application of social/behavioral theories in health promotion interventions and in conducting intervention research in diverse populations. The course will focus on program development, on implementation strategies, and on translation into practice.
Recommended: H 571 and H 575 and H 576

H 676. ADVANCED TOPICS IN HEALTH PROMOTION AND HEALTH BEHAVIOR. (3 Credits)
Examines topics of relevance to health promotion and health behavior. Specific topics include current issues and emerging research findings, with a focus on social and behavior science perspectives, analysis of public health problems, and application of principles and practices of health promotion and health behavior.
This course is repeatable for 6 credits.
Recommended: H 515 and H 571

H 681. ADVANCED TOPICS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY. (3 Credits)
Advanced topics in the environment, safety and health discipline. Content varies with each offering.

H 682. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY: MOVING FROM RESEARCH TO PRACTICE. (3 Credits)
An examination of research transfer models that can be adapted and implemented to environmental and occupational settings. Case studies and content will vary with each course offering.

H 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging of African-American, Latino, and Asian-Pacific Islander elderly. Taught spring term even years. CROSSLISTED as H 685/HDFS 685.
Equivalent to: HDFS 685
Recommended: 9 credits of public health or HDFS graduate coursework

H 699. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

Public Health Graduate Certificate
Available via Ecampus (http://ecampus.oregonstate.edu/).

The online Graduate Certificate in Public Health is designed for public health practitioners and others seeking professional development and continuing education within the field of public health. The certificate
consists of 18 graduate credits focusing on key domains in public health. All of the courses are available online.

**Certificate Code: CG10**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHS 513</td>
<td>INTEGRATED APPROACH TO PUBLIC HEALTH I</td>
<td>6</td>
</tr>
<tr>
<td>HHS 514</td>
<td>INTEGRATED APPROACH TO PUBLIC HEALTH II</td>
<td>6</td>
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</tbody>
</table>

**Electives**

Select a minimum of 6 credits from the following:

- H 512  INTRODUCTION TO ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES
- H 518  PUBLIC HEALTH ETHICS AND ISSUES
- H 520  HEALTH DISPARITIES
- H 524  INTRODUCTION TO BIOSTATISTICS
- H 530  HEALTH POLICY ANALYSIS AND POLICIES
- H 533  HEALTH SYSTEMS ORGANIZATION
- H 536  HEALTHCARE ORGANIZATION LEADERSHIP THEORY AND BEHAVIOR
- H 571  PRINCIPLES OF HEALTH BEHAVIOR
- HHS 597  GLOBAL HEALTH SYSTEMS

**Total Hours: 18**

**Certificate Code: CG10**

**Public Health Graduate Major (MPH, PhD)**

**Graduate Areas of Concentration**

Biostatistics (MPH only); environmental and occupational health (MPH, PhD); epidemiology (MPH, PhD); health systems and policy (MPH only); health policy (PhD only); health promotion and health behavior (MPH, PhD); global health (MPH, PhD); physical activity (MPH only); public health practice (MPH only)

Also available via Ecampus.

The public health graduate degree programs include the Master of Public Health (MPH) and the PhD in Public Health. The MPH degree includes several transcript-visible options. The PhD in Public Health is a research-oriented degree requiring in-depth study in a specialty area within the field of public health.

For further information about graduate programs in public health, visit the website (http://health.oregonstate.edu/degrees/graduate/public-health/).

The College of Public Health and Human Sciences is accredited by the Council on Education for Public Health (http://ceph.org/accredited/) (CEPD).

**Major Code: 7580**

**Doctor of Philosophy (PhD) in Public Health**

The PhD in Public Health is for individuals who wish to prepare themselves for careers in university teaching, research, consulting, policy development, or other high-level public health positions. There are currently five areas of concentration offered for the PhD degree:

1. Environmental and occupational health
2. Epidemiology
3. Global health
4. Health policy
5. Health promotion and health behavior

A master’s degree in a relevant field is required before admission into the PhD program.

The PhD program consists of a minimum of 109 credits, including at least 36 graduate credits devoted to preparation of the thesis. Doctoral students take courses in public health knowledge, research methods and statistics, their concentration area, and other relevant areas. Each student and their doctoral committee jointly determine the student’s specific program of doctoral study. This process allows students to design a course of study uniquely suited to their particular needs and career goals. Further information about these requirements is available on the PhD in Public Health website (http://health.oregonstate.edu/degrees/graduate/public-health/phd-program/).

**Master of Public Health (MPH)**

The College of Public Health and Human Sciences offers the following options within the MPH degree:

1. Biostatistics
2. Environmental and Occupational Health
3. Epidemiology
4. Global Health
5. Health Management and Policy
6. Health Promotion and Health Behavior
7. Physical Activity
8. Public Health Practice

All MPH students take the integrated core course, H 513 (12 credits) or the combination of HHS 513 (6 credits) and HHS 514 (6 credits). These courses introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health.

All MPH students must complete a 6-credit internship through enrollment in H 510.

MPH students must complete final assessments or oral examinations based upon the academic option in which they are enrolled.

See handbooks (http://health.oregonstate.edu/degrees/graduate/public-health/graduate-handbooks/) for other degree requirements.

**Major Code: 7580**

**Biostatistics Graduate Option**

This option is offered within the following major(s):

- Public Health - College of Public Health and Human Sciences (p. 867)

The Biostatistics graduate option of the MPH program will train students in statistics applied to public health and healthcare settings.
Graduates will be able to work in health departments, medical schools, nongovernmental agencies, and CDC and WHO field programs.

Option Code: 7581

Environmental and Occupational Health Graduate Option

This option is offered within the following major(s):

- Public Health - College of Public Health and Human Sciences (p. 867)

The Environmental and Occupational Health graduate option of the MPH program focuses on understanding the impact of environmental and occupational hazards on human health and society, as well as developing effective interventions that will control and prevent exposure to hazards.

Option Code: 7582

Global Health Graduate Option

This option is offered within the following major(s):

- Public Health - College of Public Health and Human Sciences (p. 867)

The Global Health graduate option of the MPH program prepares students for public health leadership roles in international health, with an emphasis on health development for those in middle- and low-income nations. Courses focus on understanding complex issues, problem solving and developing analytical skills to critically view global health issues in order to promote progressive, comprehensive, sustainable and equitable community ownership of health development. As part of this interdisciplinary program, students acquire wide-ranging knowledge of international health while also developing an individually designed specialization.

Option Code: 7587

Health Promotion and Health Behavior Graduate Option

This option is offered within the following major(s):
• Public Health - College of Public Health and Human Sciences (p. 867)

In the Health Promotion and Health Behavior graduate option of the MPH program, students will gain an understanding of the role of behavioral and social influences in public health and learn to apply the principles and practices of health promotion and behavior to address current and emerging public health problems.

Option Code: 7585

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>H 515</td>
<td>RESEARCH METHODS IN SOCIAL AND BEHAVIORAL HEALTH SCIENCES</td>
<td>3</td>
</tr>
<tr>
<td>H 524</td>
<td>INTRODUCTION TO BIOSTATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>H 549</td>
<td>MASS MEDIA AND HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>H 571</td>
<td>PRINCIPLES OF HEALTH BEHAVIOR</td>
<td>3</td>
</tr>
<tr>
<td>H 575</td>
<td>EVALUATION OF HEALTH PROMOTION AND EDUCATION PROGRAMS</td>
<td>3</td>
</tr>
<tr>
<td>H 576</td>
<td>PROGRAM PLANNING FOR HEALTH/HUMAN SERVICES</td>
<td>4</td>
</tr>
<tr>
<td>HHS 580</td>
<td>GRANT WRITING FOR PUBLIC HEALTH PRACTITIONERS</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives 17

Total Hours 41

Option Code: 7585

Health Systems and Policy Graduate Option

This option is offered within the following major(s):

• Public Health - College of Public Health and Human Sciences (p. 867)

In the Health Systems and Policy graduate option of the MPH program, students will develop the ability to think about public health problems in practical ways using sound conceptual frameworks. Public health problems will be viewed from the perspective of those who receive, provide, finance and regulate care.

Option Code: 7592

Physical Activity Graduate Option

This option is offered within the following major(s):

• Public Health - College of Public Health and Human Sciences (p. 867)

The Physical Activity graduate option of the MPH program is designed primarily for those future professionals interested in the science of physical activity and its application in populations. This option prepares physical activity program specialists for a variety of careers that involve developing, implementing, and evaluating community-based programs designed to promote physically active lifestyles. These careers are in state and local health departments, federal agencies; Extension offices; prevention research centers; professional, commercial, and nonprofit organizations; worksites; and schools.

Option Code: 7591

Public Health Practice Graduate Option

This option is offered within the following major(s):

• Public Health - College of Public Health and Human Sciences (p. 867)

Available only via Ecampus.

The online Public Health Practice graduate option of the MPH program prepares students for work in applied public health settings such as local, state, and national agencies; non-governmental organizations, healthcare systems, and private industry. The interdisciplinary curriculum incorporates key domains of public health work, including science, community, management and leadership, and policy and systems. This non-thesis, practice-based option can be completed in two years or six quarters; students also have the flexibility of completing the program on a part-time basis. Students will be able to add electives such as data analysis modules and other OSU online graduate level courses to enhance their program of study.

Option Code: 7589
Public Health Graduate Minor

The public health graduate minor is for master's and doctoral degree students in other majors who seek formal training and mentoring in public health. For more information, contact a faculty member in one of the public health graduate programs or the associate dean for academic and faculty affairs in the College of Public Health and Human Sciences.

Minor Code: 7580

School of Biological and Population Health Sciences

The School of Biological and Population Health Sciences comprises the fields of kinesiology, nutrition, and the public health disciplines of biostatistics, epidemiology, global health, and environmental and occupational health. These disciplinary approaches link individual biology and behavior to population and environmental health to better understand how environmental and behavioral factors, including food and nutrition, physical activity, water, pollution, carcinogens, biohazards, etc., influence the development and progression of a biological disease. Applying the quantitative methods of epidemiology and biostatistics allows a better understanding of the causes of population-level disease as well as methods of intervention and prevention.

The School of Biological and Population Health Sciences houses the undergraduate degrees of Kinesiology, and Nutrition. Nationally recognized programs prepare students for careers as athletic trainers, dietitians, medical and allied health science professionals, teachers in physical education, nutritionists, researchers, personal trainers, and fitness and nutrition professionals. The majors and their options are described below.

The Bachelor of Science degree in Public Health is offered through the School of Social and Behavioral Health Sciences (http://health.oregonstate.edu/sbhs/).

The School of Biological and Population Health Sciences houses the Masters in Public Health (http://health.oregonstate.edu/degrees/graduate/public-health/MPH/) options of biostatistics, epidemiology, global health, environmental and occupational health, and physical activity. Environmental and Occupational Health, Epidemiology, and Global Health are also areas of concentration within the Public Health doctoral program (http://health.oregonstate.edu/degrees/graduate/public-health/PhD-program/).

Master's and doctoral degrees are available in Nutrition (http://health.oregonstate.edu/degrees/graduate/nutrition/) and Kinesiology (http://health.oregonstate.edu/degrees/graduate/kinesiology/).

Undergraduate Studies

Preparation

Entering first-year and undergraduate transfer students should prepare to enter the College of Public Health and Human Sciences with a strong foundation in the sciences, balanced with good writing and critical thinking skills. Students transferring from other institutions are best prepared for the college curriculum if they have taken chemistry or biology or both.

Admission

Any student who has met the admission requirements of Oregon State University may be admitted to a nutrition or exercise and sport science program of study. To transfer from another OSU college, the student must meet with an academic advisor in the College of Public Health and Human Sciences' Office of Student Success.

Physical Activity Courses

The Physical Activity Course (PAC) Program is an elective, academic-credit program designed to provide OSU students with the opportunity to learn and engage in a wide variety of physical activities with the goal of promoting health and lifelong participation in physical activity. Students may take any number of PAC credits, but only 11 credits may be counted toward graduation. Successful completion of any PAC section will satisfy the one-credit laboratory requirement of the fitness category of the baccalaureate core. Courses may be repeated for credit and a grade. There is a PAC fee for each class, and some courses have additional fees. All fees are listed in the Schedule of Classes (https://classes.oregonstate.edu/). Student accounts are billed upon registration. Refunds of the PAC fee are automatic upon dropping or withdrawing from the course and follow university policies as listed in the OSU Academic Catalog. Some additional fees are refunded through the PAC Office (Langton 123). Some courses are available as Non-Credit (https://health.oregonstate.edu/pac/non-credit/) options. Social dance classes are listed with a men's and a women's section in order help balance the number of students in the traditional lead-and-follow roles within the same class.
Undergraduate Programs

Majors
- Kinesiology (p. 904)
  Option:
  - Pre-Therapy and Allied Health
- Nutrition (p. 907)
  Options:
  - Pre-Dietetics
  - Dietetics
  - Nutrition and Health Sciences
  - Nutrition and Foodservice Systems

Minors
- Environmental and Occupational Health (p. 902)
- Exercise Physiology (p. 903)
- Nutrition (p. 907)

Graduate Programs

Majors
- Adapted Physical Education (p. 901)
- Athletic Training (p. 902)
- Kinesiology (p. 903)
  Option:
  - Adapted Physical Activity
- Nutrition (p. 906)

Minors
- Epidemiology (p. 902)
- Ergonomics (p. 903)
- Kinesiology (p. 904)
- Nutrition (p. 907)

Professional Programs
- Doctor of Physical Therapy (p. 910)

Norman Hord, School Head
101 Milam Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-2643
Email: norman.hord@oregonstate.edu
Website: http://health.oregonstate.edu/bphs

Faculty Listings: https://health.oregonstate.edu/directory

Health and Human Sciences

HHS 001. SERVICE LEARNING. (0 Credits)
Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.

HHS 002. LEADERSHIP. (0 Credits)
Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

HHS 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

HHS 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 231. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness
Equivalent to: HHP 231, HHS 231H

HHS 231H. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness; HNRS – Honors Course Designator
Equivalent to: HHS 231

HHS 241. *LIFETIME FITNESS. (1 Credit)
Assessment, evaluation and practice of physical fitness and health behaviors leading to the development of a personal fitness program. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness

HHS 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 18 credits.

HHS 440. GLOBAL NUTRITION. (3 Credits)
Examines causes and consequences of nutritional problems including malnutrition, both under- and overnutrition, that impact health, developmental capacity, and economic well-being of populations in developing societies. Explores policies, practices, and cultural approaches to improving nutritional status at the household, local and international levels.

HHS 513. INTEGRATED APPROACH TO PUBLIC HEALTH I. (6 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health. This course is the first of a two-part course sequence.

HHS 514. INTEGRATED APPROACH TO PUBLIC HEALTH II. (6 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including: evidence-based approaches to public health; public health and health care systems; planning and management to promote health; and policy in public health. This course is the second of a two part course sequence.
Prerequisites: HHS 513 with B- or better
HHS 517. CASE STUDIES IN PUBLIC HEALTH PRACTICE. (3 Credits)
Case-based learning to illustrate the complexity of public health issues and to demonstrate the need for integrated approaches for developing and implementing successful strategies in public health practice. Students will apply a wide range of knowledge and skills essential to public health practice that relate to outbreak investigation, policy analysis, regulatory decision-making, ethics, program development, program evaluation, risk communication, and disaster preparedness.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 526. LINEAR REGRESSION IN PUBLIC HEALTH. (2 Credits)
Biostatistical tools for scientific applications in public health using linear regression analysis. Confounding, effect modification, variable selection, assessing model fit, observational studies, and exploratory data analysis. Emphasis on the use of statistical packages for analyzing public health data.
Prerequisites: H 524 with B- or better
This course is repeatable for 4 credits.

HHS 527. LOGISTIC REGRESSION IN PUBLIC HEALTH. (2 Credits)
Biostatistical tools for scientific applications in public health using logistic regression analysis. Confounding, effect modification, variable selection, assessing model fit, exploratory data analysis, and observational studies. Emphasis on the use of statistical packages for analyzing public health data.
Prerequisites: H 524 with B- or better

HHS 537. EVIDENCE-BASED LEADERSHIP IN PUBLIC HEALTH. (3 Credits)
Examines how collaboration differs from working together, and offer opportunities to develop skills for successful and effective group functioning. Students will be challenged to examine personal strengths (and the strengths of others) as they relate to leadership and followership. Explores evidence-based management – identifying and using organizational and scientific data in decision making.
Prerequisites: H 536 with B- or better

HHS 540. GLOBAL NUTRITION. (3 Credits)
Examines causes and consequences of nutritional problems including malnutrition, both under- and overnutrition, that impact health, developmental capacity, and economic well-being of populations in developing societies. Explores policies, practices, and cultural approaches to improving nutritional status at the household, local and international levels.

HHS 541. PUBLIC HEALTH PERSPECTIVE ON GLOBAL FOOD SECURITY. (3 Credits)
Explore food insecurity and hunger in the U.S. and global contexts, including examination of the causes, correlates, and consequences of hunger and community, national, and international food safety nets.

HHS 550. COMMUNICATING FOR PUBLIC HEALTH POLICY IMPACT. (3 Credits)
Successful public health professionals communicate clearly and in compelling ways with non-scientific audiences. In this hands-on course, the theory and practice of effective public health communication will be explored, with a focus on advancing a public health policy. Through a selected public health policy topic, students will develop and enhance skills in planning and implementing impactful public health communications, including message development, data visualization, media interviewing, engaging through social media and presenting to policymakers. Professionals in the field, including those in legislative and media roles, will share examples of effective communication and provide constructive feedback on students’ work.

HHS 578. EVIDENCE-BASED PUBLIC HEALTH I. (3 Credits)
Evidence-based public health is the process of integrating science-based interventions with community preferences to improve the health of populations. This is the first in a two-course series and provides theoretical and practical bases to identify, implement and evaluate evidence-based research (i.e., programs, surveillance, policies). Students will develop skills to select and adapt evidence-based public health programs for a specific community and/or population.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 579. EVIDENCE-BASED PUBLIC HEALTH II. (3 Credits)
Evidence-based public health is the process of integrating science-based interventions with community preferences to improve the health of populations. This is the second in a two-course series. Applies science and adaptation frameworks learned in the first course to the development of a program plan. Provides instruction and application of program planning and program evaluation frameworks. Course learning is synthesized through the development of a grant proposal for adapted public-health program plus evaluation plan.
Prerequisites: H 575 with B- or better and HHS 578 [B-]

HHS 580. GRANT WRITING FOR PUBLIC HEALTH PRACTITIONERS. (4 Credits)
Provides an introduction to principles of grant writing, with an emphasis on grants seeking funding from national, regional, or local entities (e.g., CDC, foundations) that support research and program that aim to improve community health through health promotion. There will be a focus on grants that MPH-level practitioners seek to conduct research, enhance practice, and/or support delivery of programs within communities. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a grant proposal.
Prerequisites: H 515 with C- or better and H 575 [C-] and H 576 [C-]

HHS 584. SURVEILLANCE AND FIELD EPIDEMIOLOGY FOR PUBLIC HEALTH. (3 Credits)
A review of public health surveillance systems, and the continuum of communicable disease surveillance into field epidemiology and other responses to identified events.
Prerequisites: H 524 with B- or better or HHS 514 with B- or better

HHS 590. PUBLIC HEALTH LAW. (2 Credits)
Explores the use of law and policy tools to promote access to health and healthy living conditions. Examines the legal powers and duties of government at the federal, state, and local levels to ensure the conditions required for people to be healthy. Discussion of individual rights as limitations on the power of the government to act in furtherance of public health goals.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 597. GLOBAL HEALTH SYSTEMS. (3 Credits)
Explores key components of global health systems, using case studies of institutions, processes, and health outcomes.

HHS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Kinesiology

KIN 131. INTRODUCTION TO KINESIOLOGY. (1 Credit)
Overview of the field; career opportunities in exercise and sport science and other professions dealing with the discipline of human movement; orientation to support services. Graded P/N.
Equivalent to: EXSS 131
KIN 132. INTRODUCTION TO THE ALLIED HEALTH PROFESSIONS. (1 Credit)
Overview of allied health professions including physical and occupational therapy, physician assistant, nursing, athletic training and others. Discuss job responsibilities, employment opportunities and educational requirements.
Equivalent to: EXSS 132

KIN 160. INTRODUCTION TO INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE. (3 Credits)
Introduction to management of physical activity-related injury for the non-healthcare provider (e.g., coaches, physical educators and fitness professionals).
Equivalent to: EXSS 160

KIN 194. PROFESSIONAL ACTIVITIES. (1-2 Credits)
Basic movement skills, basic rhythms, track and field.
Equivalent to: EXSS 194

KIN 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 230. INTRODUCTION TO ADVENTURE PROGRAMS. (3 Credits)
Foundation course for leadership opportunities in the Adventure Leadership Institute (ALI). Provides overview of history, theoretical foundations, and utilization of adventure programs in education, recreation, and therapy.
Equivalent to: EXSS 230

KIN 231. HUMAN GROUP DYNAMICS. (3 Credits)
Provides students with the fundamental concepts and theories essential for understanding dynamics that occur in groups in recreation, leisure, and everyday settings.
Equivalent to: EXSS 231

KIN 232. BACKCOUNTRY LEADERSHIP. (3 Credits)
Prepares students to be leaders in outdoor settings by building the practical and logistical skills needed in the effective delivery of courses and/or trips. Covers the teaching skills and essentials for trip leaders in the wilderness, including trip planning, logistics, risk management, and group interaction in the backcountry.
Prerequisites: (EXSS 230 with C or better or KIN 230 with C or better) and PAC 301 [C] and PAC 303 [C] and PAC 329 [C]
Equivalent to: EXSS 232

KIN 233. TEACHING TECHNIQUES FOR OUTDOOR ACTIVITIES. (3 Credits)
Gateway course for students pursuing the Level Three Adventure Leadership Certificate. Emphasizes teaching outdoor activities at a professional level. Students work individually with the course instructor to develop, plan and implement an activity course (land or water based) for the Adventure Leadership Institute.
Prerequisites: KIN 232 with C or better or KIN 232 with C or better
Equivalent to: EXSS 233

KIN 299. SPECIAL TOPICS. (1-3 Credits)
Equivalent to: EXSS 299
This course is repeatable for 24 credits.

KIN 301. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 301
This course is repeatable for 16 credits.

KIN 305. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 306. PROJECTS. (1-16 Credits)
This course is repeatable for 36 credits.

KIN 307. SEMINAR. (1-3 Credits)
Section 2: Seminar Pre-Internship (1 credit).
Equivalent to: EXSS 307
This course is repeatable for 36 credits.

KIN 311. MOTOR BEHAVIOR. (4 Credits)
Underlying mechanisms and factors affecting movement function, skill acquisition, and changes in movement behavior across the lifespan.
Prerequisites: BI 232 with C- or better or BI 332 with C- or better
Equivalent to: EXSS 311

KIN 312. *SOCIOCULTURAL DIMENSIONS OF PHYSICAL ACTIVITY. (4 Credits)
Physical activity in contemporary society. Relationships with the social processes; interrelationships between physical activity and cultural institutions. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture
Equivalent to: EXSS 312

KIN 314. INTRODUCTION TO ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Overview of cognitive, neuromuscular, sensory and orthopedic disabilities; understanding accessible physical activity programs for individuals with disabilities.
Equivalent to: EXSS 314

KIN 321. BIOMECHANICS OF HUMAN MOVEMENT. (4 Credits)
Integration of the physical laws and anatomical structures governing human movement; qualitative analytical processes emphasized.
Prerequisites: ((BI 231 with C- or better and BI 241 [C-]) or (BI 331 [C-] and BI 341 [C-])) and (MTH 112 [C-] or MTH 251 [C-])
Equivalent to: EXSS 321

KIN 324. EXERCISE PHYSIOLOGY. (4 Credits)
Physiological effects of acute and chronic exercise; factors affecting human performance; exercise training principles.
Prerequisites: (BI 233 with C- or better or BI 333 with C- or better) and (BI 231 [C-] or BI 331 [C-]) and (CH 121 [C-] or CH 231 [C-] or CH 231H [C-]) and (CH 122 [C-] or CH 232 [C-] or CH 232H [C-]) and (CH 123 [C-] or CH 233 [C-] or CH 233H [C-] or CH 130 [C-])
Equivalent to: EXSS 324

KIN 325. FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION. (3 Credits)
Introduction to lab- and field-based physical fitness assessments and the skills needed to design safe and effective exercise programs for apparently healthy adults. Lec/lab.
Prerequisites: KIN 324 with C- or better or EXSS 324 with C- or better
Equivalent to: EXSS 325

KIN 333. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Equivalent to: EXSS 333

KIN 334. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Prerequisites: KIN 333 with C- or better
Equivalent to: EXSS 334
KIN 335. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Equivalent to: EXSS 335

KIN 341. NUTRITION FOR EXERCISE. (3 Credits)
Review of the interrelationship between nutrition and exercise, including macronutrient, micronutrient and fluid needs for active individuals.
CROSSTLITED as KIN 341/NUTR 240.
Prerequisites: KIN 324 with C- or better and NUTR 240 [C-]
Equivalent to: EXSS 341, NUTR 341

KIN 343. PRE- THERAPY/ALLIED HEALTH SEMINAR. (1 Credit)
Provides knowledge in professional school preparation and current issues related to the allied health professions.
Prerequisites: KIN 132 with C or better or BI 109 with C or better and BI 231 [C] and BI 232 [C] and BI 233 [C] and BI 241 [C] and BI 242 [C] and BI 243 [C]
Equivalent to: EXSS 343
Recommended: Overall GPA of 3.0

KIN 344. PRE- THERAPY/ALLIED HEALTH PRACTICUM. (1 Credit)
Clinical field experiences under the supervision of a licensed professional in the allied health or related setting enhanced with classroom discussion.
Prerequisites: KIN 132 with C or better and BI 231 [C] and BI 232 [C] and BI 233 [C] and BI 241 [C] and BI 242 [C] and BI 243 [C]
Corequisites: KIN 343
Equivalent to: EXSS 344
This course is repeatable for 2 credits.
Recommended: Overall GPA of 3.0

KIN 345. ALLIED HEALTH PRACTICUM. (1-2 Credits)
Field experience under professional supervision in an allied health or related setting. Includes arranged consultations with the instructor to discuss current issues related to the allied health professions.
Equivalent to: EXSS 345
This course is repeatable for 2 credits.
Recommended: Overall GPA of 2.75

KIN 353. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 353
Recommended: OSU GPA 2.00, KIN GPA 2.50, and completion or concurrent enrollment in KIN 422 or KIN 423

KIN 354. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 354
Recommended: OSU GPA 2.00, KIN GPA 2.50 and concurrent enrollment in KIN 422 or KIN 423

KIN 355. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 355
Recommended: OSU GPA 2.00, KIN GPA 2.50 and concurrent enrollment in KIN 422 or KIN 423

KIN 360. INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE. (3 Credits)
Introduction to management of physical activity-related injury for the non-healthcare provider (e.g., coaches, physical educators and fitness professionals) and pre-professional.

KIN 370. PSYCHOLOGY OF SPORT AND PHYSICAL ACTIVITY. (3 Credits)
Interaction between psychological variables and human motor performance.
Equivalent to: EXSS 370

KIN 380. THERAPEUTIC MODALITIES. (4 Credits)
Indications, contraindication, techniques, and effects of various physical agents used in the care and treatment of musculoskeletal injuries and diseases.
Equivalent to: EXSS 380

KIN 385. THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise; rehabilitative activities and programs for musculoskeletal injuries, conditions, and diseases. Lec/lab.
Prerequisites: KIN 321 with C- or better or EXSS 321 with C- or better
Equivalent to: EXSS 385

KIN 394. PROFESSIONAL ACTIVITIES: RESISTANCE TRAINING PROGRAM DESIGN. (3 Credits)
Presents the conceptual basis for optimizing resistance training program designs, exercise routines for all ages and fitness levels, correct exercise technique. Lec/lab.
Prerequisites: KIN 324 with C- or better and KIN 325 [C-]
Equivalent to: EXSS 394

KIN 395. PROFESSIONAL ACTIVITIES: GROUP FITNESS. (3 Credits)
Application of biomechanical, physiological, psychological and safety principles for the development of group exercise classes in a variety of modes and settings. Lec/lab.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better) and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 395

KIN 396. PROFESSIONAL ACTIVITIES: AQUATICS. (3 Credits)
Aquatic overview; emphasis on underlying hydrodynamic principles; includes safety, survival, stroke mechanics, aquatic exercise, training, games. Lec/lab/activity.
Equivalent to: EXSS 396
Recommended: PAC 250

KIN 399. SPECIAL TOPICS. (1-3 Credits)
Equivalent to: EXSS 399, KIN 399H
This course is repeatable for 18 credits.

KIN 399H. SPECIAL TOPICS. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: KIN 399
This course is repeatable for 18 credits.

KIN 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 401
This course is repeatable for 16 credits.

KIN 403. THESIS. (1-16 Credits)
Equivalent to: EXSS 403
This course is repeatable for 16 credits.

KIN 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 405
This course is repeatable for 16 credits.
KIN 406. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 406
This course is repeatable for 16 credits.

KIN 407. SEMINAR. (1-16 Credits)
Equivalent to: EXSS 407
This course is repeatable for 16 credits.

KIN 408. WORKSHOP. (1-16 Credits)
Equivalent to: EXSS 408
This course is repeatable for 16 credits.

KIN 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 410. INTERNSHIP. (1-15 Credits)
Planned experiences at selected cooperating agencies, companies or institutions; supervised by university and program personnel; supplementary conference, reports and appraisal required.
Equivalent to: EXSS 410
This course is repeatable for 20 credits.
Recommended: Completion of required courses, cumulative Kinesiology program GPA of 2.25, KIN overall GPA of 2.50 and completion of 165 credits

KIN 411. NEUROMUSCULAR CONTROL OF HUMAN MOVEMENT. (3 Credits)
Exploration and understanding of the neurological basis of human movement with emphasis on models of motor function and dysfunction.
Prerequisites: KIN 311 with C- or better

KIN 422. FACILITATING PHYSICAL ACTIVITY FOR CHILDREN AND YOUTH. (3 Credits)
Students learn skills for facilitating physical activity programs for children and youth in a variety of settings, including information on the benefits of physical activity, program design, implementation and management techniques.
Prerequisites: KIN 311 with C- or better or EXSS 311 with C- or better
Equivalent to: EXSS 422

KIN 423. QUALITATIVE MOVEMENT ANALYSIS. (3 Credits)
Develop observational skills to perform systematic qualitative analyses of selected physical activity performances and other human movements.
Prerequisites: (KIN 311 with C- or better or EXSS 311 with C- or better) and (KIN 324 with C- or better or EXSS 324 with C- or better)
Equivalent to: EXSS 423

KIN 425. ANATOMICAL KINESIOLOGY. (4 Credits)
Anatomical aspects of human movement; actions of bones and muscles in motor activities. Application of physical principles to factors governing anatomical function in health and injury.
Prerequisites: EXSS 321 with C- or better or KIN 321 with C- or better
Equivalent to: EXSS 425

KIN 432. PHYSICAL ACTIVITY ASSESSMENT. (3 Credits)
Assessment of physical activity using subjective and objective measurement methods with focus on applications for individuals, communities, and special populations.
Equivalent to: EXSS 432

KIN 434. APPLIED MUSCLE PHYSIOLOGY. (3 Credits)
Skeletal muscle structure, function, and metabolism; applications to muscle fatigue, exercise training, inactivity, and aging.
Prerequisites: KIN 324 with C- or better or EXSS 324 with C- or better
Equivalent to: EXSS 434

KIN 435. PHYSICAL ACTIVITY PROMOTION. (3 Credits)
Application of behavioral science and public health research to the promotion of physical activity in individuals, groups and communities.
Prerequisites: KIN 370 with C- or better
Equivalent to: EXSS 435

KIN 437. PHYSICAL ACTIVITY, AGING, AND CHRONIC DISEASE. (4 Credits)
Addresses the consequences of primary and secondary aging from an individual and public health perspective. Physiological changes associated with aging and chronic disease, functional assessment of older adults, and exercise prescription for older adults with and without chronic exercise will be emphasized.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better) and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 437

KIN 444. ADVANCED ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Discuss various disability models and perspectives; reinforce determinants of physical activity; design and implement different physical activity programs and curricula for individuals with disabilities.
Prerequisites: (KIN 314 with C- or better or EXSS 314 with C- or better)
Equivalent to: EXSS 444

KIN 462. BEHAVIORAL DIMENSIONS OF PHYSICAL ACTIVITY. (4 Credits)
Adopting and maintaining an active, healthy lifestyle is difficult. This course explores 'why' this might be the case and 'how' to improve upon the situation.
Prerequisites: KIN 312 with C- or better and KIN 370 [C-]

KIN 474. EXERCISE PHYSIOLOGY LAB METHODS. (3 Credits)
Practical experience and projects in exercise physiology lab methods, including measurement of submaximal and maximal oxygen consumption body composition, anaerobic power, and electrocardiography.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better) and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 474

KIN 475. *POWER AND PRIVILEGE IN SPORT. (3 Credits)
Issues of power and privilege in sport including race, gender, sexual orientation, disability and aggression and the consequences of long held society norms and stereotypes. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: (KIN 312 with C- or better or EXSS 312 with C- or better)
Equivalent to: EXSS 475

KIN 481. *ANALYSIS OF CRITICAL ISSUES IN KINESIOLOGY. (3 Credits)
Reading and interpreting current research, and using writing as a tool for learning on a critical issue in kinesiology. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: KIN 381

KIN 483. TISSUE INJURY AND REPAIR. (3 Credits)
Mechanics of tissue injury and the body's response and repair following injury of bone, muscle, tendon, ligament, cartilage and nervous system tissue.
Prerequisites: (BI 231 with C- or better or BI 331 with C- or better) and (BI 241 [C-] or BI 341 [C-]) and (BI 232 [C-] or BI 332 [C-]) and (BI 242 [C-] or BI 342 [C-]) and (BI 233 [C-] or BI 333 [C-]) and (BI 243 [C-] or BI 343 [C-]) or ((Z 331 [C-] and Z 332 [C-] and Z 333 [C-] and Z 341 [C-]) and Z 342 [C-] and Z 343 [C-])
Equivalent to: EXSS 483
KIN 490. SCIENTIFIC INQUIRY IN KINESIOLOGY. (4 Credits)
Principles and techniques of organization, administration, interpretation and evaluation of exercise science-related data. Includes human subjects training and certification, research design, and statistical analysis using SPSS and Excel including central tendency, correlation and regression, probability, and inferential statistics (t-tests and ANOVA). Lec/lab.
Prerequisites: KIN 325 with C- or better and MTH 112 [C-]

KIN 499. SELECTED TOPICS. (1-5 Credits)
Impact of human movement development on people, their movement behavior, and environment. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Equivalent to: EXSS 499
This course is repeatable for 24 credits.

KIN 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 501
This course is repeatable for 16 credits.

KIN 503. THESIS. (1-16 Credits)
Equivalent to: EXSS 503
This course is repeatable for 999 credits.

KIN 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 505
This course is repeatable for 16 credits.

KIN 506. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 506
This course is repeatable for 16 credits.

KIN 507. SEMINAR. (1-16 Credits)
Section 1: Seminar (1). Graduate research seminar that emphasizes student oral presentations of current research topics in exercise and sport science. One credit required for all graduate students. Section 2: Current Developments (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. Two credits required of all doctoral students. Section 9: International Aspects (1). Discussion of international aspects of study in exercise and sport science. Topics vary by term. Required of all doctoral students. Graded P/N.
Equivalent to: EXSS 507
This course is repeatable for 16 credits.

KIN 508. WORKSHOP. (1-16 Credits)
Equivalent to: EXSS 508
This course is repeatable for 16 credits.

KIN 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 35 credits.

KIN 510. INTERNSHIP. (1-16 Credits)
Planned experiences at selected cooperating agencies, companies or institutions; supervised by university and program personnel; supplementary conference, reports and appraisal required.
Equivalent to: EXSS 510
This course is repeatable for 26 credits.

KIN 511. INTRODUCTION TO ATHLETIC TRAINING. (4 Credits)
Practice domains include injury and illness prevention and wellness protection, clinical evaluation and diagnosis, immediate and emergency care, treatment and rehabilitation, and organizational and professional health and well-being. Lec/lab.

KIN 512. APPLIED MOTOR LEARNING. (3 Credits)
Application of research and theory to the teaching of motor skills with emphasis on development of instructional strategies related to modeling, knowledge of results, practice, and motivational aspects of learning.
Equivalent to: EXSS 512
Recommended: KIN 311

KIN 513. MOTOR DEVELOPMENT: AN INTEGRATIVE APPROACH. (3 Credits)
Addresses the social, cultural, biological and psychological processes and health-related factors (e.g., physical activity) that jointly influence lifespan motor development (emphasis on the early years).

KIN 515. MOTOR CONTROL AND MOVEMENT DYSFUNCTION. (3 Credits)
Contemporary motor control theories and their application to the development of instructional and training programs for individuals with movement disorders caused by neurological disease and/or trauma.
Equivalent to: EXSS 515
Recommended: KIN 311 and (KIN 314 or KIN 444)

KIN 520. ORTHOPEDIC ASSESSMENT OF UPPER EXTREMITY INJURIES. (4 Credits)
Prevention, assessment and management of upper extremity injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 511 with C or better

KIN 521. ORTHOPEDIC ASSESSMENT OF LOWER EXTREMITY INJURIES. (4 Credits)
Prevention, assessment and management of lower extremity injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 511 with C or better

KIN 522. ORTHOPEDIC ASSESSMENT OF SPINE. (4 Credits)
Prevention, assessment and management of spinal injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 520 with C or better and KIN 521 [C]

KIN 523. BIOMECHANICS OF MOTOR ACTIVITIES. (3 Credits)
Kinematic and kinetic analysis of volitional human movement with emphasis on analytical techniques and quantitative problem solving.
Equivalent to: EXSS 523
Recommended: KIN 323 or PH 201

KIN 525. BIOMECHANICS OF MUSCULOSKELETAL INJURY. (3 Credits)
Mechanical causes and effects of forces applied to the musculoskeletal system, material properties of human tissues, pathomechanics of injury, and degenerative changes across the lifespan. Not offered every year.
Equivalent to: EXSS 525

KIN 531. PHYSIOLOGY OF PHYSICAL ACTIVITY AND INACTIVITY. (3 Credits)
Physiologic responses to acute and chronic physical activity and inactivity with emphasis on underlying mechanisms and health outcomes.

KIN 532. PHYSICAL ACTIVITY ASSESSMENT. (3 Credits)
Assessment of physical activity using subjective and objective measurement methods with focus on applications for individuals, communities, and special populations.
Equivalent to: EXSS 532

KIN 533. ENERGETICS AND BIOCHEMISTRY OF EXERCISE. (3 Credits)
Metabolic and energetic responses to acute and chronic physical activity; emphasis on recent research.
Equivalent to: EXSS 533
Recommended: Undergraduate course in biochemistry or exercise physiology.
KIN 535. PHYSICAL ACTIVITY PROMOTION. (3 Credits)
Application of behavioral science and public health research to the
promotion of physical activity in individuals, groups and communities.
Recommended: KIN 370

KIN 536. PHYSICAL ACTIVITY IN DIVERSE POPULATIONS. (3 Credits)
Addresses the social, cultural, political, and environmental determinants
of physical activity and health among diverse populations. Includes
examination of intersecting issues related to race, ethnicity, gender, age,
disability, geography, income status, and other societal factors across the
lifespan for promoting physical activity through public health strategies.

KIN 544. ADVANCED ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Discuss various disability models and perspectives; reinforce
determinants of physical activity; design and implement different
physical activity programs and curricula for individuals with disabilities.
Lec/lab.
Equivalent to: EXSS 544
Recommended: KIN 314

KIN 547. INCLUSION IN PHYSICAL ACTIVITY. (3 Credits)
Effectiveness of physical activity programs provided in inclusive settings.
This will include a lifespan/non-categorical approach to program
development.
Equivalent to: EXSS 547
Recommended: KIN 314 or KIN 444

KIN 548. ASSESSMENT AND PROGRAMMING FOR SPECIAL
POPULATIONS. (3 Credits)
Use of appropriate assessment procedures for developing effective
psychomotor programs for the disabled.
Equivalent to: EXSS 548
Recommended: KIN 314 or KIN 444

KIN 549. PHYSICAL ACTIVITY FOR PERSONS WITH SEVERE
DISABILITIES. (3 Credits)
Plan, develop and implement appropriate physical activity programs,
functional program design, assistive technology, instructional strategies,
behavior management practices, and data analysis systems that address
the needs for psychomotor performance of persons with low incidence
disabilities.
Equivalent to: EXSS 549
Recommended: KIN 314 or KIN 444

KIN 550. HEALTH PROMOTION FOR PEOPLE WITH DISABILITIES. (3 Credits)
Discussion will focus on disability and health, theory driving health
promotion program development, guidelines for developing a program for
individuals with disabilities, and program evaluation.
Equivalent to: EXSS 550

KIN 551. CURRENT TRENDS AND ISSUES IN PHYSICAL EDUCATION. (4 Credits)
Current trends and issues in physical education, including curriculum
development, professional ethics, instructional practices, and physical
activity for the school community.
Equivalent to: EXSS 551

KIN 553. INSTRUCTIONAL ANALYSIS TECHNIQUES I. (3 Credits)
Introduction to techniques of instructional analysis. Provides in-depth
information and training in systematic observation techniques, raw data
conversion and inter/intraobserver reliability.
Equivalent to: EXSS 553

KIN 554. INSTRUCTIONAL ANALYSIS TECHNIQUES II. (3 Credits)
Laboratory/seminar experience to accompany student teaching
winter and spring terms. Provides continued application of systematic
observation techniques throughout the elementary student teaching
Experience.
Equivalent to: EXSS 554

KIN 555. SKILL ANALYSIS AND ASSESSMENT IN K-12. (3 Credits)
Develop proficiency in assessing movement skills, execution of sport
techniques, and game play performance. Assessment trends and
practices utilized in physical education programs are included.
Equivalent to: EXSS 555

KIN 556. INSTRUCTIONAL SKILLS I. (3 Credits)
Skills of planning, implementing, and evaluating programs of instruction
in physical education, grades K-12.
Equivalent to: EXSS 556

KIN 557. INSTRUCTIONAL SKILLS II. (2 Credits)
Applying and refining skills of planning, implementing, and evaluating
programs of instruction in physical education, grades K-12.
Equivalent to: EXSS 557

KIN 558. PHYSICAL EDUCATION CURRICULUM DESIGN AND
ORGANIZATION. (3 Credits)
Curricular programs and variations from kindergarten through grade 12,
administrative policies and practices.
Equivalent to: EXSS 558

KIN 559. THE PHYSICAL EDUCATOR AS A PROFESSIONAL. (1 Credit)
Transitioning to teaching, developing a portfolio, certification, obtaining
a position, teacher burnout, professionalism, problems of first-year
teachers, developing patterns of behavior that lead to a successful career.
Equivalent to: EXSS 559

KIN 560. MOTIVATION IN PHYSICAL ACTIVITY. (3 Credits)
A social psychological approach to understanding the role of self-
perceptions and cognitions in explaining motivated behavior in sport and
exercise settings.
Equivalent to: EXSS 560
Recommended: KIN 370

KIN 561. PSYCHOSOCIAL FACTORS IN PHYSICAL ACTIVITY. (3 Credits)
A social psychological approach to understanding the role of social
interactions and contextual factors in explaining human behavior in sport
and exercise settings.
Equivalent to: EXSS 561
Recommended: KIN 560

KIN 562. LIFESPAN SPORT AND EXERCISE PSYCHOLOGY. (3 Credits)
Social-psychological issues across the lifespan in the context of sport
and exercise.
Equivalent to: EXSS 562
Recommended: KIN 561

KIN 564. PROGRAM CAPSTONE AND SYNTHESIS. (3 Credits)
Capstone course in which teacher candidates will review and update
their teaching philosophy; showcase their Physical Education master's
portfolio; and develop a plan for professional development.
Prerequisites: KIN 510 with C- or better

KIN 565. EMERGENCY MANAGEMENT OF SPORTS TRAUMA. (3 Credits)
Knowledge and skills related to the specialized care required for serious
and/or life-threatening acute athletic related injuries and illnesses. Lec/
lab.
Prerequisites: KIN 566 with C or better
KIN 566. GENERAL MEDICAL ASSESSMENT. (4 Credits)
Prevention, evaluation, diagnosis, and management of general medical conditions commonly encountered by the athletic trainer.
Prerequisites: KIN 565 with C or better

KIN 567. PHARMACOLOGY IN ATHLETIC TRAINING. (3 Credits)
Pharmacology in sports medicine, topics including, but not limited to, the mechanisms and actions of drugs commonly administered and prescribed in sports medicine environments.
Prerequisites: KIN 566 with C or better

KIN 568. ATHLETIC TRAINING PROGRAM MANAGEMENT. (3 Credits)
Administrative aspects of athletic training program management. Including principles of risk management, strategic and operational planning, medical-legal aspects of athletic healthcare, confidentiality and documentation of patient health information, insurance and third-party reimbursement, personnel issues, and current professional issues.
Prerequisites: KIN 566 with C or better

KIN 569. EVIDENCE-BASED PRACTICE. (3 Credits)
Principles and skills underlying the utilization of evidence to enhance clinical practice decision-making. Includes the development of clinical questions, review and appraisal of relevant literature, and utilization of patient-centered outcome measures.
Prerequisites: KIN 521 with C or better

KIN 573. MEASUREMENT IN HUMAN MOVEMENT. (3 Credits)
Equivalent to: EXSS 573
Recommended: ST 511

KIN 575. RESEARCH IN HUMAN MOVEMENT. (3 Credits)
Investigation and evaluation of research methods applicable to human movement study and professional physical education.
Equivalent to: EXSS 575
Recommended: ST 511

KIN 584. PHYSIOLOGY AND MANAGEMENT OF MUSCULOSKELETAL INJURIES. (3 Credits)
Mechanics of musculoskeletal tissue injuries; physiologic response and repair processes of various tissues; and effects of physical agents commonly used by athletic trainers in the care and treatment of musculoskeletal injuries.
Prerequisites: KIN 511 with C or better

KIN 585. UPPER EXTREMITY THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise and manual therapy for the upper extremity, cervical spine, and thoracic spine. Lec/lab.
Prerequisites: KIN 586 with C or better

KIN 586. LOWER EXTREMITY THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise and manual therapy with a focus on the lower extremity, lumbar spine and ribs.
Prerequisites: KIN 584 with C or better

KIN 599. SPECIAL TOPICS. (1-3 Credits)
Impact of human movement development on people, their movement behavior, and environment. Topics vary from term to term and year to year. May be repeated when topics differ.
Equivalent to: EXSS 599
This course is repeatable for 99 credits.

KIN 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 601
This course is repeatable for 16 credits.

KIN 603. THESIS. (1-16 Credits)
Equivalent to: EXSS 603
This course is repeatable for 99 credits.

KIN 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 605
This course is repeatable for 16 credits.

KIN 606. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 606
This course is repeatable for 16 credits.

KIN 607. SEMINAR. (1-16 Credits)
Section 1: Graduate Research (1). Seminar emphasizes student oral presentations of current research topics in exercise and sport science. One credit required of all graduate students. Section 3: Current Developments (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. Two credits required of all doctoral students. Section 9: International Aspects (1). Discussion of international aspects of study in exercise and sport science. Required of all doctoral students. Graded P/N.
Equivalent to: EXSS 607
This course is repeatable for 16 credits.

KIN 610. PROFESSIONAL INTERNSHIP: PHYSICAL EDUCATION. (1-15 Credits)
Field experience in which the term will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples.
Equivalent to: EXSS 610
This course is repeatable for 25 credits.

KIN 647. CURRENT TOPICS AND RESEARCH IN ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Current trends and critical research issues in adapted physical activity; focus on international and national trends. Topic will be variable.
Equivalent to: EXSS 647

KIN 699. SPECIAL TOPICS. (1-16 Credits)
Current issues, trends, and topics in KIN research. May be repeated for credit with different topics.
Equivalent to: EXSS 699
This course is repeatable for 25 credits.

Nutrition

NUTR 104. ORIENTATION TO THE NUTRITION MAJOR. (1 Credit)
Discuss and explore the academic and professional requirements for successful entry into professional careers in dietetics, foodservice systems management, and human nutrition sciences majors. Identify professional resources, career opportunities, markets and trends in these OSU Nutrition major options. Graded P/N.
Equivalent to: NFM 104

NUTR 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: NFM 199
This course is repeatable for 16 credits.

NUTR 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
NUTR 216. *FOOD IN NON-WESTERN CULTURE. (3 Credits)
Cultural determinants influencing food habits of humans. Interrelation of eating patterns and socio-cultural, ecological, psychological and economic factors in cross-cultural settings. Roles of men and women in food provision. Lec/rec. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: NFM 216

NUTR 225. GENERAL HUMAN NUTRITION. (3 Credits)
The relationship of food, its nutrients and other components to the promotion of health and fitness with the young adult. Current health concerns on a national and international level. This course is for non-majors; NES majors and those in the health sciences should take NUTR 240.
Equivalent to: NFM 225

NUTR 235. SCIENCE OF FOODS. (5 Credits)
Composition, functional properties, and structure of foods, including modified ingredients. Principles underlying preparation of food products of standard quality. Lec/lab.
Prerequisites: CH 123 with C- or better or CH 223 with C- or better or ((CH 263 with C- or better or CH 263H with C- or better or CH 273 with C- or better) and (CH 233 [C-] or CH 233H [C-]))
Equivalent to: NFM 235

NUTR 240. HUMAN NUTRITION. (3 Credits)
An introductory nutrition course for exercise science, nutrition, dietetics, food science, and health science majors who have taken general chemistry. Concepts of nutrient metabolism and utilization, nutrient deficiencies and toxicities and their relationship to disease prevention and treatment.
Prerequisites: (CH 121 with C- or better or CH 224H with C- or better or (CH 223 with C- or better or CH 231H with C- or better))
Equivalent to: NFM 240

NUTR 241. APPLICATIONS IN HUMAN NUTRITION. (1 Credit)
Application of nutrition theory from NUTR 240 using a dietary project and hands-on recreation activities. A key focus of the course will be on applying nutrition theory. Rec.
Prerequisites: NUTR 240 (may be taken concurrently) with C- or better
Equivalent to: NFM 241

NUTR 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: NFM 299

NUTR 306. PROJECTS. (1-16 Credits)
This course is repeatable for 36 credits.

NUTR 307. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

NUTR 311. FOODSERVICE PRODUCTION AND PURCHASING. (4 Credits)
Food production, purchasing, facility and materials management in foodservice operations. Quantity production styles, safety and sanitation, service methods and equipment. Lec/lab/rec.
Prerequisites: NUTR 235 with C- or better
Equivalent to: NFM 311

NUTR 312. *ISSUES IN NUTRITION AND HEALTH. (3 Credits)
Impact of nutrition as one component of complex environmental, behavioral, social, and genetic factors significant to health promotion. Apply scientific knowledge to current health issues of changing dietary patterns, technological development in food products and nutrition controversies. Recognize economic and public policy implications. Lec/rec. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: NUTR 225 with C- or better or NUTR 240 with C- or better
Equivalent to: NFM 312
Recommended: Completion of science requirement in Bacc Core

NUTR 319. PROMOTING FOOD AND NUTRITION. (3 Credits)
Strategies in promoting products, services or ideas; negotiating, advertising, public policy, consumer service, social marketing, market research, trends and strategies. Lec/lab.
Prerequisites: NUTR 240 with C- or better and NUTR 241 [C-]
Equivalent to: NUTR 219

NUTR 325. NUTRITION THROUGH THE LIFE CYCLE. (3 Credits)
NUTR 235 with C- or better and NUTR 240 with C- or better
Equivalent to: NUTR 325

NUTR 341. NUTRITION FOR EXERCISE. (3 Credits)
Junior standing
Prerequisites: KIN 324 with C- or better and NUTR 240 [C-]
Recommended: Junior standing
Equivalent to: EXSS 341, KIN 341

NUTR 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: NFM 399

NUTR 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: NFM 401

NUTR 403. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 403

NUTR 405. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 405

NUTR 406. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: NFM 406

NUTR 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 407

NUTR 408. WORKSHOP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 408

This course is repeatable for 16 credits.
NUTR 409. PRACTICUM. (1-16 Credits)
Equivalent to: NFM 409
This course is repeatable for 16 credits.

NUTR 410. FIELD EXPERIENCE. (1-15 Credits)
Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. For advanced students. Applications made and approved term preceding enrollment. Graded P/N.
Equivalent to: NFM 410
This course is repeatable for 50 credits.

NUTR 416. *CULTURAL ASPECTS OF FOODS. (3 Credits)
Regional, ethnic, and religious influences on food patterns; worldwide trends in food practices. Laboratory experience with foods from several cultures. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUTR 235 with C- or better
Equivalent to: NFM 416

NUTR 417. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: BB 350 with C- or better
Equivalent to: NFM 417
Recommended: One physiology course

NUTR 418. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: NUTR 417 with C- or better
Equivalent to: NFM 418
Recommended: Biochemistry and physiology

NUTR 423. COMMUNITY NUTRITION. (4 Credits)
Meeting nutritional needs in community settings; nutritional status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist.
Prerequisites: NUTR 325 with C- or better
Equivalent to: NFM 423

NUTR 430. MEDICAL NUTRITION THERAPY I. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions. Lec/lab/rec.
Prerequisites: (BB 350 with C- or better or BB 450 with C- or better and BB 451 [C]) and (BI 233 [C] or BI 332 [C]) and (BI 242 [C] or BI 342 [C]) and (BI 233 [C] or BI 333 [C]) and (BI 243 [C] or BI 343 [C]) and NUTR 417 (may be taken concurrently) [C] and NUTR 439 [C]

NUTR 431. MEDICAL NUTRITION THERAPY 2. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Prerequisites: NUTR 430 with C- or better

NUTR 432. MEDICAL NUTRITION THERAPY 3. (3 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Prerequisites: NUTR 431 with C- or better

NUTR 439.  *COMMUNICATIONS IN DIETETICS. (3 Credits)
Theory and practice in food and nutrition communications in dietetics. Experience in nutritional counseling and interviewing, employee training and nutritional education materials development, public speaking, and media presentation strategies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUTR 325 with C- or better
Equivalent to: NFM 439

NUTR 446. MANAGING FOOD AND NUTRITION SERVICES. (4 Credits)
Overview of organizational structure, functions of managers in food and nutrition service organizations: human and financial resources, regulatory influences, health care organizations, current issues in operations. Lec/rec.
Prerequisites: NUTR 311 with C- or better
Equivalent to: NFM 446

NUTR 447. MANAGEMENT OF FOOD SYSTEMS LABORATORY. (3 Credits)
Application of theory in managing a university food service as part of a student team: planning, production, projecting resource needs, evaluation of outcomes and financial goals.
Equivalent to: NFM 447
Recommended: NUTR 446 or NUTR 546

NUTR 499. SPECIAL TOPICS IN DIETETICS. (1-16 Credits)
Current issues, trends, and topics in nutrition and dietetics. May be repeated for credit when topic varies.
Equivalent to: NFM 499
This course is repeatable for 16 credits.

NUTR 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 501
This course is repeatable for 16 credits.

NUTR 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 502
This course is repeatable for 16 credits.

NUTR 503. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 503
This course is repeatable for 999 credits.

NUTR 504. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 504

NUTR 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 505
This course is repeatable for 16 credits.

NUTR 506. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 506
This course is repeatable for 16 credits.

NUTR 507. SEMINAR. (1-16 Credits)
1 credit graded P/N.
Equivalent to: NFM 507
This course is repeatable for 16 credits.

NUTR 508. WORKSHOP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 508
This course is repeatable for 16 credits.
NUTR 509. PRACTICUM. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 509
This course is repeatable for 16 credits.

NUTR 510. FIELD EXPERIENCE: INTERNSHIP. (1-16 Credits)
Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. Limited to students admitted to degree program. Application made and approved in the term preceding enrollment. No more than 6 credits may be applied to a master's degree program.
Equivalent to: NFM 510
This course is repeatable for 6 credits.

NUTR 514. HEALTH BENEFITS OF FUNCT FOODS, NUTRACEUT, DIETARY SUPPLEMEN. (3 Credits)
Functional foods, nutraceuticals and dietary supplements represent a rapidly expanding segment of domestic and international markets. This course will overview the principles and procedures necessary to evaluate and market these products. The chemistry and mechanisms of major nutraceutical ingredient categories and current scientific information supporting their biochemical and physiological efficacy will be addressed. Special dietary products, such as medical, weight control, sport, and herbal supplements, will be addressed. Regulatory aspects of labeling and structure-function claims will be covered. CROSSTIGHT as FST 514/NUTR 514.
Equivalent to: FST 514, NFM 514
Recommended: BB 350 and CH 332

NUTR 516. CULTURAL ASPECTS OF FOODS. (3 Credits)
Regional, ethnic, and religious influences on food patterns; worldwide trends in food practices. Laboratory experience with foods from several cultures. Lec/lab.
Equivalent to: NFM 516
Recommended: NUTR 235

NUTR 517. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Equivalent to: NFM 517
Recommended: BB 350 and one physiology course

NUTR 518. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: NUTR 517 with C or better
Equivalent to: NFM 518
Recommended: biochemistry, physiology.

NUTR 523. COMMUNITY NUTRITION. (4 Credits)
Meeting nutritional needs in community settings; nutritional status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist.
Equivalent to: NFM 523
Recommended: NUTR 325

NUTR 525. ORGANIC FOOD AND HEALTH: EVIDENCE AND CONSUMER PERCEPTIONS. (3 Credits)
Overview of organic food including an understanding of the definition, certifications and labeling; basic production comparisons with conventional foods, evidence for comparisons between organic and conventionally produced foods; consumer attitudes and perceptions regarding organic foods.

NUTR 530. MEDICAL NUTRITION THERAPY I. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions. Lec/lab/rec.
Recommended: BB 350 and BB 450 and BB 451 and BI 232 or BI 332
and (BI 242 or BI 342) and (BI 233 or BI 333) and (BI 243 or BI 343) and NUTR 439 and completion or concurrent enrollment in NUTR 417

NUTR 531. MEDICAL NUTRITION THERAPY 2. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Recommended: NUTR 430

NUTR 532. MEDICAL NUTRITION THERAPY 3. (3 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Recommended: NUTR 431

NUTR 535. NUTRITION AND EXERCISE: MACRONUTRIENTS AND ENERGY METABOLISM. (3 Credits)
Current research examining the interrelationship of macronutrients and exercise and energy balance will be reviewed, including their roles in health, disease prevention and exercise performance.
Equivalent to: NFM 535
Recommended: NUTR 517 or KIN 533

NUTR 539. COMMUNICATIONS IN DIETETICS. (3 Credits)
Theory and practice of food and nutrition communications in dietetics. Experience in nutritional counseling and interviewing, employee training and nutritional education materials development, public speaking, and media presentation strategies.
Equivalent to: NFM 539
Recommended: NUTR 325

NUTR 546. FOODSERVICE ORGANIZATIONS. (3 Credits)
Overview of organizational structure, functions of managers in foodservice organizations: human resources, regulatory influences, health care organizations, current issues in operations. Lec/rec.
Equivalent to: NFM 546
Recommended: NUTR 311 and NUTR 445

NUTR 550. NUTRITIONAL STATUS. (4 Credits)
Research studies with emphasis on estimation of nutrient intake and assessment of nutritional status, including biochemical, clinical, epidemiological and anthropometric measures. Interpretation of status indicators.
Equivalent to: NFM 550
Recommended: NUTR 418 or NUTR 518

NUTR 551. ADVANCED MEDICAL NUTRITION THERAPY. (4 Credits)
This advanced course includes evidence-based practices and standards of care available to address complex scenarios for which medical nutrition therapy is an integral part of patient care. Students will build on prior assessment, nutritional diagnostic, implementation, monitoring, evaluation and documentation skills relevant to dietetics practice. Lecture, readings, case studies including professional documentation and expert guest will be used to illustrate medical nutrition therapy addressing topics such as as domestic malnutrition, nutrition support, pediatric nutrition, eating disorders, diabetes and geriatric nutrition.
NUTR 552. FOOD AND NUTRITION PROGRAM MANAGEMENT AND EVALUATION. (4 Credits)
Introduction to the evaluation of outcomes and impacts of food/nutrition-related systems, performance, interventions, programs and/or policies. Application of methods used to appraise problems or activities, as well to conceptualize, create, implement and administer evaluations in order to make decisions regarding their outcomes, impacts, efficiency and cost effectiveness. A case study approach across a range of food and nutrition-related public, government and private organizations will introduce the breadth of approaches in such evaluations.

NUTR 553. DIETARY BEHAVIOR AND COUNSELING. (4 Credits)
Strategies for navigating dietary behavior using collaborative, patient-centered, goal-oriented approaches. Introduces the theoretical framework around dietary behavior and motivational interviewing with methods regarding the language of change and creating client/patient interest in change. Guided practice and focus on development of skills.

NUTR 599. SPECIAL TOPICS IN NUTRITION. (1-16 Credits)
Current issues, trends, and topics in nutrition and health. May be repeated for credit when topic varies.
Equivalent to: NFM 599
This course is repeatable for 16 credits.

NUTR 601. RESEARCH. (1-16 Credits)
Equivalent to: NFM 601
This course is repeatable for 16 credits.

NUTR 602. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 602
This course is repeatable for 16 credits.

NUTR 603. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 603
This course is repeatable for 999 credits.

NUTR 605. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 605
This course is repeatable for 16 credits.

NUTR 607. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 607
This course is repeatable for 16 credits.

NUTR 609. PRACTICUM. (1-16 Credits)
Equivalent to: NFM 609
This course is repeatable for 16 credits.

NUTR 610. INTERNSHIP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 610
This course is repeatable for 16 credits.

NUTR 617. ADVANCED MACRONUTRIENT METABOLISM. (3 Credits)
Focuses on human macronutrient metabolism. Macronutrient topics include water, carbohydrate, lipid, amino acid/protein, lipid and carbohydrate and energy metabolism. Emphasis is placed on the integration of metabolism at the molecular, biochemical and physiological level. Moreover, the class examines contemporary issues relevant to macronutrient metabolism and human disease. Offered even years in spring term.
Equivalent to: NFM 617
Recommended: NUTR 418 or NUTR 518

NUTR 618. ADVANCED MICRONUTRIENT METABOLISM. (3 Credits)
Focus is on human micronutrient metabolism. Topics include micronutrients (vitamins and minerals), phytochemicals and mammalian metabolism. Emphasis will be placed on the integration of micronutrient/phytochemical metabolism at the molecular, biochemical and physiological level. Moreover, the class examines contemporary issues relevant to micronutrient/phytochemical metabolism and human disease.
Equivalent to: NFM 618
Recommended: NUTR 418 or NUTR 518 and basic knowledge of biochemistry and physiology

NUTR 699. SPECIAL TOPICS IN NUTRITION RESEARCH. (1-16 Credits)
Current issues, trends, and topics in nutrition research. May be repeated for credit when topic varies.
Equivalent to: NFM 699
This course is repeatable for 16 credits.

Physical Activity Courses

PAC 100. ADAPTED PHYSICAL ACTIVITY. (1 Credit)
Individual workout for students with permanent or temporary physical disabilities and for students enrolled in another PAC who sustain an injury.
This course is repeatable for 11 credits.

PAC 102. AQUA AEROBICS. (1 Credit)
Fitness class using a variety of movements in shallow and deep water, mostly in a vertical position. Do not need swimming skills.
Equivalent to: PAC 101
This course is repeatable for 11 credits.

PAC 103. DEEP WATER FITNESS. (1 Credit)
Fitness class using a variety of movements in a deep water pool, mostly in a vertical position. Should be comfortable in deep water.
This course is repeatable for 11 credits.

PAC 104. ARCHERY. (1 Credit)
Basic mechanics and introduction to archery. Exposure to varying archery techniques and equipment, including recurve and compound bow shooting.
This course is repeatable for 11 credits.

PAC 105. CPR/FIRST AID. (1 Credit)
Introduces cardiac and first aid emergency response procedures. Emphasis placed on safe response, chain of survival, quality CPR (adults, children, infants and team responses), use of an AED, medical emergencies, injury emergencies and environmental emergencies. Students successfully completing the American Heart Association certification requirements will be issued a Heartsaver First Aid and BLS (Basic Life Support) for the Healthcare Provider certification at the end of the course.
This course is repeatable for 11 credits.

PAC 106. BEAVER FIT. (1 Credit)
A conditioning class for those of all fitness levels that focuses on mobility, functional movement, and high-intensity interval training as a means to improve cardiovascular fitness, muscular fitness, and flexibility.
This course is repeatable for 11 credits.

PAC 108. STEP AEROBICS. (1 Credit)
Low-impact, high intensity workout adjustable to all fitness levels utilizing adjustable height benches. Strengthening and flexibility exercises included.
This course is repeatable for 11 credits.
PAC 110. INTRODUCTION TO WHITE WATER KAYAKING. (2 Credits)
Students will learn fundamentals of white water kayaking in sheltered water based on the internationally recognized British Canoe (BC) teaching and skills certification system. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course runs for six class sessions of 3 hours (Fridays), and one mandatory Saturday (5-hour) session. The entire class lasts for six weeks. 
This course is repeatable for 11 credits.

PAC 111. INTRODUCTION TO CANOEING. (2 Credits)
Students will learn fundamentals of canoeing in sheltered water based on the internationally recognized British Canoe (BC) teaching and skills certification system. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course runs for six class sessions of 3 hours (Fridays), and one mandatory Saturday (5-hour) session. The entire class lasts for six weeks. 
This course is repeatable for 11 credits.

PAC 112. LEARNING KAYAK ROLLING BASICS. (2 Credits)
Students learn fundamentals of rolling a kayak in an indoor pool-based environment. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course is repeatable for 10 credits.

PAC 113. BADMINTON I. (1 Credit)
Singles and doubles skills, practice, rules, and strategy. 
This course is repeatable for 11 credits.

PAC 114. BADMINTON II. (1 Credit)
Intermediate skill development in badminton. 
This course is repeatable for 11 credits. 
Recommended: Fundamental skills, rules and strategy of singles and doubles play.

PAC 115. OUTDOOR LIVING SKILLS. (2 Credits)
Educates and introduces students on how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. Classroom and field (lab) experience. Includes one mandatory weekend overnight outing. CROSSLISTED as PAC 115/TRAL 115. 
Equivalent to: TRAL 115 
This course is repeatable for 4 credits.

PAC 116. BASKETBALL I (MEN/WOMEN). (1 Credit)
Fundamental basketball skills, drills, rules, strategies, and practice. Game play appropriate for the skill level. 
This course is repeatable for 11 credits.

PAC 117. BASKETBALL COMPETITIVE. (1 Credit)
Team play, individual and team skills developed and refined, competitive round robin tournaments. 
This course is repeatable for 11 credits.

Recommended: Prior competitive experience.

PAC 118. LABORATORY FOR OUTDOOR LIVING SKILLS. (1 Credit)
Practical field application of concepts learned in PAC 115/TRAL 115, Outdoor Living Skills. Field (lab) experience includes one mandatory weekend overnight. Introduces how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. CROSSLISTED as PAC 118/ TRAL 118. 
Corequisites: PAC 115 
Equivalent to: TRAL 118 
This course is repeatable for 2 credits.

PAC 120. MOUNTAIN BIKING. (1 Credit)
Touring trails in Corvallis area; riding techniques, safety, maintenance, environmental concerns. Required equipment: mountain bike, tire repair kit, helmet. 
This course is repeatable for 11 credits.

PAC 121. BILLIARDS. (1 Credit)
Skills, technique, strategy, game knowledge as introduction to billiards (pool), a 'cue' sport; rules and gaming for variations of pocket billiards; practice and class tournament play. 
This course is repeatable for 11 credits.

PAC 122. BODY SCULPTING. (1 Credit)
Fitness workout set to music using lighter resistance training aids such as dumbbells, resistance tubing, bands, and aerobic steps. 
This course is repeatable for 11 credits.

PAC 123. BOWLING I. (1 Credit)
Review and refinement of basic fundamentals of bowling. Emphasis on spot bowling, adjusting for lane conditions, choices in equipment, league play, and mental training. 
This course is repeatable for 11 credits. 
Recommended: Bowling I or the ability to bowl above a 110 average

PAC 124. BOWLING II. (1 Credit)
High intensity group workout set to motivational music and combining skills and techniques from boxing, kickboxing, and other martial arts. 
This course is repeatable for 11 credits.

PAC 125. CARDIO KICKBOXING I. (1 Credit)
Combination of aerobic training classes that use music such as Cardio Kickboxing, Body Sculpture, Sports Conditioning, and/or Step Aerobics. Actual curriculum may vary with instructors. 
This course is repeatable for 11 credits.

PAC 126. CARDIO COMBO. (1 Credit)
Total body approach to fitness, cardiorespiratory conditioning, muscular strength and endurance; flexibility emphasized. May follow a specific training format, e.g., ROTC section follows Army conditioning format. 
This course is repeatable for 11 credits.

PAC 130. CONDITIONING. (1 Credit)
Strength, muscular endurance, flexibility, balance, and cardiovascular exercises specific to downhill skiing and snowboarding; designed to help prepare students for participation in these sports. 
This course is repeatable for 11 credits.

PAC 131. SNOWBOARD-SKI CONDITIONING. (1 Credit)
Strength, muscular endurance, flexibility, balance, and cardiovascular exercises specific to downhill skiing and snowboarding; designed to help prepare students for participation in these sports. 
This course is repeatable for 11 credits.

PAC 133. DANCE: TAP I. (1 Credit)
Individual and group dance with specialized shoes; basic step technique and vocabulary; warm up exercises progressing into rhythmic combinations performed to music; culminates in full routine to music. 
This course is repeatable for 11 credits.

PAC 136. DANCE: BALLET I. (1 Credit)
Introduction to basic ballet technique and aesthetics, terminology, alignment, stretch and strength exercises. No previous dance experience needed. Additional fee for accompanist. 
This course is repeatable for 11 credits.
PAC 137. DANCE: BALLET II. (1 Credit)
Review and practice of beginning ballet technique, introduction of
more advanced stretches, steps, and combinations. Additional fee for
accompanist.
This course is repeatable for 11 credits.
Recommended: Ballet I or previous ballet experience.

PAC 138. DANCE: BALLET III. (1 Credit)
Intermediate and advanced ballet technique, comprehensive exploration
of the discipline. Additional fee for companion.
This course is repeatable for 11 credits.
Recommended: Ballet II, previous comparable experience

PAC 139. HIP HOP DANCE. (1 Credit)
Aerobic/energetic experience consisting of a warm-up/conditioning and
choreographic combinations.
This course is repeatable for 11 credits.

PAC 140. DANCE: JAZZ I. (1 Credit)
Introduction to jazz dance, technique, isolations, and combinations.
Different jazz styles are explored. No previous dance experience is
necessary.
This course is repeatable for 11 credits.

PAC 141. DANCE: JAZZ II. (1 Credit)
Intermediate jazz technique, isolations and combinations.
This course is repeatable for 11 credits.
Recommended: Jazz I or comparable experience.

PAC 145. DANCE: MODERN I. (1 Credit)
Introduction to modern dance movement fundamentals. Technique,
stretch, strength, and alignment are included, as well as an appreciation
for movement expression. No previous dance experience needed.
Additional fee for companion.
This course is repeatable for 11 credits.

PAC 146. DANCE: MODERN II. (1 Credit)
An intermediate level of modern dance technique and movement
expression. Additional fee for companion.
This course is repeatable for 11 credits.
Recommended: Modern Dance I or comparable experience.

PAC 148. DANCE: CUBAN SALSA I (MEN/WOMEN). (1 Credit)
Foundations of Cuban Salsa (Casino) as well as Rueda de Casino
with focus on musical development and fundamentals of leading and
following in partner dance.
This course is repeatable for 11 credits.

PAC 149. DANCE: CUBAN SALSA II. (1 Credit)
Higher concepts of Cuban Salsa (Casino) as well as Rueda de Casino,
with focus on musical development and fundamentals of leading and
following in partner dance.
This course is repeatable for 11 credits.
Recommended: Cuban Salsa I or comparable experience.

PAC 150. CULTURAL WORLD DANCE (MEN/WOMEN). (1 Credit)
Introduction to traditional dance forms from Europe, Israel, North America
and Asia, focusing on movement, cultural heritage, history, and diversity.
This course is repeatable for 11 credits.

PAC 151. COUNTRY LINE DANCE. (1 Credit)
Non-partner dance routines in country western style; musical
interpretation, footwork, and sequencing of 20 different routines.
This course is repeatable for 11 credits.

PAC 152. DANCE: SALSA I. (1 Credit)
Steps and rhythmic accent of Salsa and Merengue style; fundamentals
of leading and following; basic moves and combinations. No prior
experience needed.
This course is repeatable for 11 credits.

PAC 153. DANCE: SALSA II. (1 Credit)
Intermediate moves, rhythmic accents and step combinations of Salsa;
development of leading and following.
Prerequisites: PAC 152 with C- or better
This course is repeatable for 11 credits.

PAC 154. DANCE: COUNTRY WESTERN I (MEN/WOMEN). (1 Credit)
Focus on traditional Country Western Swing patterns. Emphasizes
fundamentals of leading and following. Also including introduction to
waltz, two-step, cowboy cha-cha and 10-step polka.
Equivalent to: PAC 144
This course is repeatable for 11 credits.

PAC 155. DANCE: COUNTRY WESTERN II (MEN/WOMEN). (1 Credit)
Build on CW I with advanced waltz, two-step, and cha-cha patterns;
introduces schottische and East Coast swing.
This course is repeatable for 11 credits.
Recommended: Country Western I or comparable experience

PAC 156. DANCE: COUNTRY WESTERN III (MEN/WOMEN). (1 Credit)
Advanced two-step patterns and styling with a focus on musical
interpretation; development of leading and following.
Prerequisites: PAC 155 with C- or better
This course is repeatable for 11 credits.

PAC 158. DANCE: BEGINNING SWING (MEN/WOMEN). (1 Credit)
Introduction to single time, double time, and triple time (jitterbug)
swing; variations for each style, covering most swing music rhythms.
Emphasizes fundamentals of leading and following. Men/women.
This course is repeatable for 11 credits.

PAC 159. DANCE: BALLROOM I (MEN/WOMEN). (1 Credit)
Posture and alignment, fundamentals of leading and following, basic
steps and variations for waltz, foxtrot, swing, tango, and cha-cha.
Equivalent to: PAC 134
This course is repeatable for 11 credits.

PAC 160. DANCE: BALLROOM II (MEN/WOMEN). (1 Credit)
Additional steps and patterns of popular ballroom dances.
Prerequisites: PAC 159 with C- or better
Equivalent to: PAC 135
This course is repeatable for 11 credits.

PAC 161. DANCE: BALLROOM III (MEN/WOMEN). (1 Credit)
Styling; additional dances: rhumba, silver fox trot, and Viennese waltz;
advanced dance figures for tango and cha-cha.
Prerequisites: PAC 160 with C- or better
This course is repeatable for 11 credits.

PAC 162. DANCE: SWING II (MEN/WOMEN). (1 Credit)
Social dance focusing on Twenties-style Charleston, pure Balboa and
Balboa-Swing, and Blues Dance.
This course is repeatable for 11 credits.

PAC 163. DANCE: LATIN I. (1 Credit)
Latin dances including cha-cha, mambo, salsa, rhumba, merengue,
bolero, salsa, and paso doble. Emphasis on proper styling and technical
execution of each dance; effective leading and following techniques.
Prerequisites: PAC 159 with C- or better
This course is repeatable for 11 credits.
PAC 165. DANCE: WEST COAST SWING (MEN/WOMEN). (1 Credit)
Focus on style, technique and many different step patterns of the west coast swing dance.
Prerequisites: PAC 154 with C- or better or PAC 159 with C- or better
Equivalent to: PAC 162
This course is repeatable for 11 credits.

PAC 166. BALLROOM 2 STEP, HUSTLE (MEN/WOMEN). (1 Credit)
Smooth, romantic social dance that is neither ballroom, Latin, nor swing but a rhythm dance identified as club-style, danced to contemporary ballad-like music. Hustle is fast-paced, swing-related dance to disco beat. Class encompasses intermediate step patterns, technique and styling, stationary, traveling patterns.
Prerequisites: PAC 160 with C- or better
This course is repeatable for 11 credits.

PAC 167. DANCE: LINDY HOP. (1 Credit)
Ballroom dance style based on original eight-count swing dance evolved in Harlem ballrooms during the late 1920s; styling emphasized.
Prerequisites: PAC 158 with C- or better or PAC 159 with C- or better
This course is repeatable for 11 credits.

PAC 168. DANCE: LINDY HOP II (MEN/WOMEN). (1 Credit)
Intermediate patterns, syncopations, play techniques, and styling with a focus on musical interpretation in the Lindy Hop style; development of leading and following.
Prerequisites: PAC 167 with C- or better
This course is repeatable for 11 credits.

PAC 169. COOL SHOES, BALLROOM PERFORMANCE. (2 Credits)
Learn and perform ballroom dance routines on a intermediate level. This course is a full year commitment ending with a dance concert in the spring.
This course is repeatable for 12 credits.

PAC 170. DANCE: WEST COAST SWING II (MEN/WOMEN). (1 Credit)
Intermediate patterns, syncopations, play techniques, and styling with a focus on musical interpretation; development of leading and following.
Prerequisites: PAC 165 with C- or better
This course is repeatable for 11 credits.

PAC 171. DANCE: NEW SHOES. (1 Credit)
IntroduceS students to formation ballroom dancing at a beginning level. Dances learned over the course of this term will be determined by the instructor at the beginning of the term.
Prerequisites: PAC 159 with D- or better
This course is repeatable for 11 credits.

PAC 173. INTERMEDIATE ROCK CLIMBING. (2 Credits)
Introduces variety of basic skills, gear and systems that will allow them to safely participate in a single pitch rock climbing environment based on internationally recognized American Mountain Guides Association (AMGA) teaching and skills certification systems. Presents students with various technical skills that will serve as a foundation for future land-based outdoor disciplines. Students will be introduced to gear, such as software (ropes, webbing, harnesses) and hardware (carabiners, friction devices); skills, such as knots, belaying, rappelling, lead climbing; and systems such as anchors and basic rescue techniques. CROSSLISTED as PAC 173/TRAL 173.
Equivalent to: TRAL 173
This course is repeatable for 10 credits.

PAC 174. FLAG FOOTBALL. (1 Credit)
Skill instruction and practice; drills; strategies, game play of America football; emphasis on teamwork and sportsmanship in a competitive but non-threatening or stressful environment.
This course is repeatable for 11 credits.

PAC 175. DISC GOLF II. (1 Credit)
Techniques for throwing discs; equipment, knowledge, etiquette, and rules associated with playing a disc golf course; experience playing practice and official disc golf courses.
This course is repeatable for 11 credits.

PAC 176. GOLF III. (1 Credit)
Individual practice and course play; skill refinement as continuation of Golf I. Equipment available. Course play expected, additional fee.
Recommended: Golf I

PAC 177. SPRING FISHING. (1 Credit)
Advanced fly casting and fly fishing techniques for trout, fly-tying, equipment selection, basic aquatic organism identification, terminology, and regulations for fishing in Oregon's freshwater environment.
This course is repeatable for 11 credits.

PAC 178. FLY FISHING II. (1 Credit)
Advanced fly casting and fly fishing techniques for trout, fly-tying, equipment selection, basic aquatic organism identification, terminology, and regulations for fishing in Oregon's marine environment.
This course is repeatable for 11 credits.

PAC 179. FLY FISHING III. (1 Credit)
Advanced fly casting and fly fishing techniques for trout, fly-tying, equipment selection, basic aquatic organism identification, terminology, and regulations for fishing in Oregon's marine environment.
This course is repeatable for 11 credits.

PAC 180. STEELHEAD FISHING. (1 Credit)
Casting and fishing techniques, lure making, equipment selection, terminology, and regulations for fishing in Oregon's marine environment for steelhead.
This course is repeatable for 11 credits.

PAC 181. DISC GOLF I. (1 Credit)
Basic fundamental principles in all phases of golf; rules, terminology, etiquette, safety and scoring. Equipment provided.
This course is repeatable for 11 credits.

PAC 182. GOLF I. (1 Credit)
Fundamental techniques on vault, bars, beam, and floor.
This course is repeatable for 11 credits.

PAC 183. GYMNASTICS II. (1 Credit)
Advanced skills, knowledge involved in competitive play. Course play expected, additional fee.
Recommended: Handicap below 15 or Golf II; competitive play.

PAC 184. GYMNASTICS. (1 Credit)
Gymnastics I or competitive experience.
Recommended: Gymnastics I or competitive experience.

PAC 185. GYMNASTICS II. (1 Credit)
Build upon previous gymnastics experiences or classes; floor exercise, uneven parallel bars, vault, mini-trampoline and beam apparatus are available.
This course is repeatable for 11 credits.

PAC 186. GYMNASTICS III. (1 Credit)
Build upon previous gymnastics experiences or classes; floor exercise, uneven parallel bars, vault, mini-trampoline and beam apparatus are available.
This course is repeatable for 11 credits.

PAC 187. KARATE. (1 Credit)
Instruction in traditional Japanese karate basic striking and blocking techniques, kata (forms), philosophy, conditioning, and etiquette. Self-defense applications are also emphasized.
Equivalent to: PAC 183
This course is repeatable for 11 credits.
PAC 191. BRAZILIAN JIU-JITSU. (1 Credit)
Basic level grappling self-defense techniques and applying them in sparring sessions along with understanding the core principles which make this martial arts system effective. An introduction to the history of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and culture.
This course is repeatable for 11 credits.

PAC 192. JUDO I. (1 Credit)
Skill instruction in landing, throwing and grappling for this style of martial arts; etiquette for practice and competition; basic knowledge of vocabulary, rules and scoring.
This course is repeatable for 11 credits.

PAC 193. JUDO II. (1 Credit)
Intermediate skill instruction in landing, throwing, pins, chokes in Kodokan Judo style; principles of Seiryoku-Zenyou and Jita-Kyoei designed to help individuals become better members of society through training body and mind; instruction for competition knowledge and skills. Judo etiquette for practice and competition expected.
This course is repeatable for 11 credits.
Recommended: Judo I or comparable experience

PAC 194. PILATES. (1 Credit)
Non-impact, invigorating approach to physical conditioning and mind/body awareness; helps develop core body strength, improve posture and balance, and increase muscle endurance, tone, flexibility.
This course is repeatable for 11 credits.

PAC 195. PILATES II. (1 Credit)
Progression of Joseph Pilates mat exercises; emphasis on intermediate and advanced levels; application of Pilates’ principles to new exercises; use of props; application of principles to daily living.
This course is repeatable for 11 credits.
Recommended: PAC 194, Pilates.

PAC 197. PICKLEBALL. (1 Credit)
Fast-paced, self-officiated net game with similarities to tennis, badminton, table tennis, and racquetball. Course covers rules, strategies, technique, preparation for play, and includes extensive active practice and play; played with two, three, or four people.
This course is repeatable for 11 credits.

PAC 199. SPECIAL TOPICS. (1-3 Credits)
Experimental or new classes.
This course is repeatable for 11 credits.

PAC 201. RELAXATION. (1 Credit)
Introduction to techniques that promote relaxation of the nervous system. These may include, but are not limited to: meditation, imagery, yoga postures, and self-massage. Students will be encouraged to reflect on how life choices influence their nervous system.
This course is repeatable for 11 credits.

PAC 202. MEDITATION. (1 Credit)
Examine the application of building simple awareness, how to manage thoughts in productive and compassionate ways, and how to transfer these skills into healthy relationships. Explore strategies for managing mental and physical difficulties including anxiety, pain, and overall stress through experiential learning and personal sharing of experiences.
This course is repeatable for 11 credits.

PAC 203. OBSERVATION & ASSISTANT INSTRUCTIONAL PRACTICE IN PHYS ACT. (1 Credit)
Observe and begin physical activity instruction within dance, yoga, sports, fitness, aquatics, martial arts, or cross-disciplinary physical activities. Used in several of the leadership training program curriculums.
This course is repeatable for 11 credits.

PAC 204. LEAD INSTRUCTIONAL PRACTICE IN PHYSICAL ACTIVITY. (1 Credit)
Lead physical activity curriculum within dance, yoga, fitness, aquatics, sports, martial arts, or cross-disciplinary physical activities. Gain experience implementing already designed lesson plans, assessment, and leading peers through basic exercise, while supervised by university and program personnel.
Prerequisites: PAC 203 with C- or better
This course is repeatable for 11 credits.

PAC 205. ROWING, CREW I (MEN/WOMEN). (1 Credit)
Introduction to the sport of rowing; designed for the novice (beginner). Includes basic technique and terminology, related water safety, and development of strength, endurance, and flexibility.
This course is repeatable for 11 credits.
Recommended: Swim Test (1).

PAC 208. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PAC 212. RUNNING, JOGGING. (1 Credit)
Cardiorespiratory fitness with scenic running routes; training, nutrition, and physiology. Beginning and intermediate level.
This course is repeatable for 11 credits.

PAC 213. RUNNING: 10K TRAINING. (1 Credit)
Intermediate to advanced conditioning and training program for road racing.
This course is repeatable for 11 credits.
Recommended: Prior training in running.

PAC 214. HALF MARATHON TRAINING. (2 Credits)
Progressive training combining walking, running, core strengthening, interval techniques in preparation for a 13.1 mile (1/2 marathon) event. Open to all levels; may choose to walk, walk/run, or run.
This course is repeatable for 11 credits.

PAC 215. RUGBY, TOUCH. (1 Credit)
Basic skills of open field rugby; emphasis on ball handling and attacking strategy; rules and history; game play.
This course is repeatable for 11 credits.

PAC 217. SELF DEFENSE. (1 Credit)
Nonviolent self-defense. Develop self-confidence and skills for assault situations. Conditioning and practical skills. Men and women, all levels.
This course is repeatable for 11 credits.

PAC 222. TELEMARK SKIING. (1 Credit)
Winter sport that is a cross between cross country and downhill skiing. Requires telemark equipment where the heel is unattached. Class accommodates all levels and practices on the downhill slopes. Additional fee covers bus transportation, lessons, and lift ticket. Rental of equipment is not included.
This course is repeatable for 11 credits.

PAC 225. DOWNHILL SKIING. (1 Credit)
Travel to area facilities, 1-1/2 hour lesson followed by open practice, students grouped according to skill level: beginner, intermediate, advanced, racer. Special fee covers bus transportation, lessons, and lifts. Additional fee for rentals.
This course is repeatable for 11 credits.
PAC 227. SNOWBOARDING. (1 Credit)
Travel to area facilities, 1 1/2 hour lesson followed by open practice, students grouped according to skill level: beginner, intermediate, advanced. Special fee covers bus transportation, lessons, and lifts.
Additional fee for rentals.
This course is repeatable for 11 credits.

PAC 229. SOCCER I. (1 Credit)
Basic skills of controlling the ball; conditioning; lead-up games; team play.
Equivalent to: PAC 211
This course is repeatable for 11 credits.

PAC 230. SOCCER II. (1 Credit)
Review of basic skills of offense and defense in controlled game play; concepts of team position and play, pressure and attack.
This course is repeatable for 11 credits.
Recommended: Previous soccer experience.

PAC 231. SOCCER III. (1 Credit)
High level soccer skills; team play and transition concepts; set plays and alignments for both offense and defense.
This course is repeatable for 11 credits.
Recommended: Soccer II or competitive playing experience.

PAC 233. SOCCER: INDOOR. (1 Credit)
Skill instruction and development; strategies and rules for indoor play; game play in indoor gymnasium.
This course is repeatable for 11 credits.

PAC 236. SOFTBALL, WHIFFLEBALL. (1 Credit)
Skills, rules, strategies, practice, and game play of the popular outdoor slow pitch game. Modified softball with whiffleball when play is indoors.
This course is repeatable for 11 credits.

PAC 242. SCUBA: OPEN WATER. (2 Credits)
Lecture includes physiology, water environment, equipment, and techniques for fundamental SCUBA diving. Laboratory includes practice in techniques, skills, and equipment usage; sessions held in pool and open water. Successful completion leads to PADI certification. Additional fee covers most equipment, texts, certification, and open water dive trip.
This course is repeatable for 11 credits.
Recommended: 200-yard swim, 10-minute survival skills and good health

PAC 243. SCUBA: ADVANCED OPEN WATER. (1 Credit)
Classroom lecture and laboratory in hypothermics, natural navigation, dive physiology, compass navigation, night and limited visibility procedures, boat diving, search and salvage techniques, deep diving procedures, health for diving, and an introduction to dive rescue. Successful completion of this course can lead to PADI certification.
Additional fee.
Equivalent to: PAC 228
This course is repeatable for 11 credits.
Recommended: PAC 242 or PADI Open Water Certification

PAC 244. SCUBA: RESCUE DIVER. (1 Credit)
Techniques, skills, knowledge, and practice in self-rescue and rescue of others in underwater emergencies; may lead to PADI certification; lecture and pool laboratory; open water dive required. Additional fee.
This course is repeatable for 11 credits.
Recommended: PAC 243 or PADI Advanced Open Water Certification

PAC 245. SCUBA SPECIAL TOPICS. (1 Credit)
Specialized courses requiring previous certification in SCUBA. Check the current schedule of classes for more information and prerequisites. Possible classes: altitude diver, night diver, search and recovery, deep diver, underwater navigation, equipment specialist. Additional fee.
This course is repeatable for 11 credits.
Recommended: PAC 242 or PADI Open Water Certification

PAC 246. DIVEMASTER TRAINING. (2 Credits)
Enter level PADI certification course for preparation to instruct SCUBA; lecture, lab, open water experience; must take two consecutive terms.
This course is repeatable for 11 credits.
Recommended: PAC 244. PADI Advanced, Advanced Plus, Rescue Diver certifications and 20 logged dives

PAC 247. SURFING. (1 Credit)
Knowledge and fundamental skills of this aquatic sport including history, terminology, safety precautions, the ocean environment, and equipment. Additional fee.
This course is repeatable for 11 credits.

PAC 248. SWIM: NON-SWIMMER. (1 Credit)
Skills for self-rescue; fundamental skills in swimming and safety. Designed for people with a fear of water. Recommended S/U grading.
Equivalent to: PAC 219
This course is repeatable for 11 credits.

PAC 249. LIFEGUARD TRAINING. (1 Credit)
Trains participants in the skills required to become a lifeguard. Emphasis on professional behavior, water rescues, safe response, quality CPR (adults, children, infants, and team responses), use of an AED and first aid. Students successfully completing the American Red Cross certification requirements will be issued a lifeguarding certification at the end of the course.
This course is repeatable for 11 credits.
Recommended: Basic swimming skills

PAC 250. SWIM I. (1 Credit)
Swimming concepts, survival and breathing techniques, front crawl and elementary backstroke as minimum instruction.
This course is repeatable for 11 credits.
Recommended: Basic swimming skills: float, tread water, bobbing

PAC 252. SWIM II. (1 Credit)
Fitness swimming, swimming strokes and skills.
Equivalent to: PAC 221
This course is repeatable for 11 credits.
Recommended: Swim I or the ability to front crawl continuously for 75 yards

PAC 253. SWIM TRAINING WORKOUT. (1 Credit)
Competitive skills and strokes; emphasis on training.
This course is repeatable for 11 credits.
Recommended: Ability to do interval training.

PAC 254. COMPETITIVE SWIMMING. (1 Credit)
Prepares students for competitive swimming and emphasizes lifetime aquatic fitness; interval swim workouts designed for speed and endurance; instruction on legal techniques of strokes and turns; culminates in intra-class swim meet; 2,000-3,000 yards/day.
This course is repeatable for 11 credits.
Recommended: Swim II or previous interval training experience up to 400 yard distances
PAC 256. TAIJI, TAI CHI I. (1 Credit)
Introduction to ancient Chinese ‘internal martial art’ based upon concepts of Yin and Yang; detailed slow and relaxed form movements provide benefits to body, mind, and spirit.
This course is repeatable for 11 credits.

PAC 257. TAIJI, TAI CHI II. (1 Credit)
Continuation of study of the Yang-style Taiji form; more in-depth exploration of underlying principles and push-hands exercises.
This course is repeatable for 11 credits.

PAC 260. TENNIS I. (1 Credit)
Introduction to fundamental strokes, singles and doubles play, scoring, and basic concepts in tennis.
Equivalent to: PAC 234
This course is repeatable for 11 credits.

PAC 261. TENNIS II. (1 Credit)
Review and refinement of fundamental strokes; volley, lob, return of serve; introduction to singles and doubles strategy.
Equivalent to: PAC 235
This course is repeatable for 11 credits.
Recommended: Tennis I or competitive tennis experience

PAC 262. TENNIS III. (1 Credit)
Focus on ground stroke, serve consistency; approach shots and overheads; tactics for net and baseline play.
This course is repeatable for 11 credits.
Recommended: Tennis II

PAC 264. TEAM HANDBALL/(MEN/WOMEN). (1 Credit)
Fast-paced indoor court game that combines skills and strategies similar to water polo, basketball, soccer and hockey; rules, regulations, strategies, and skills introduced and practiced; requires teamwork, cooperation, and court strategy.
This course is repeatable for 11 credits.

PAC 265. TUMBLING I. (1 Credit)
Technical instruction, progressions, and practice in basic, intermediate, and advanced tumbling skills; emphasis on safety and fitness concepts; floor and mini-trampoline skills; no apparatus instruction.
This course is repeatable for 11 credits.

PAC 266. TUMBLING II. (1 Credit)
Technical instruction, progressions, safety, and practice building upon skills taught in PAC 265, Tumbling I.
This course is repeatable for 11 credits.
Recommended: Tumbling I or prior experience.

PAC 268. TRIATHLON TRAINING. (2 Credits)
Training in swimming, running, and bicycling to prepare for triathlon participation. Strategies, transitioning technique, and weight training information; training plan formation; event planning; culminates in class or community event.
This course is repeatable for 11 credits.
Recommended: Experience in at least one of the three activities.

PAC 271. ULTIMATE FRISBEE. (1 Credit)
Fundamentals for the beginning and intermediate player; individual skill development, rules, game play, and strategy.
This course is repeatable for 11 credits.

PAC 273. VOLLEYBALL I. (1 Credit)
Fundamental volleyball skills, drills, rules, strategies, and practice. Game play appropriate for skill level.
This course is repeatable for 11 credits.

PAC 274. VOLLEYBALL II. (1 Credit)
Fundamental skills and knowledge refined; intermediate skills developed, competitive play.
This course is repeatable for 11 credits.
Recommended: Volleyball I and good fundamental skills.

PAC 275. VOLLEYBALL III. (1 Credit)
Skill refinement and development; intense, highly competitive drills and game situations, doubles through sixes play.
This course is repeatable for 11 credits.
Recommended: Volleyball II or varsity-level experience

PAC 278. FITNESS WALKING. (1 Credit)
Establishment of personal fitness programs through walking with emphasis on technique and aerobic components.
This course is repeatable for 11 credits.

PAC 282. WATER POLO. (1 Credit)
Team game, played in deep water; instruction in skills, drills, strategies, techniques; game play; knowledge of rules and terminology.
This course is repeatable for 11 credits.

PAC 286. WEIGHT TRAINING: CIRCUITS. (1 Credit)
Fast-paced fitness class using stations of resistance training exercises. Designed to improve cardiovascular fitness and muscular endurance more than strength.
This course is repeatable for 11 credits.

PAC 287. WEIGHT TRAINING I. (1 Credit)
Exercise techniques in both free and fixed resistance training equipment; safety procedures, terminology, and principles of exercise.
This course is repeatable for 11 credits.

PAC 288. WEIGHT TRAINING II. (1 Credit)
Intermediate level of weight training in free and fixed weights.
Prerequisites: PAC 287 with C+ or better
This course is repeatable for 11 credits.

PAC 292. WRESTLING. (1 Credit)
Collegiate wrestling fall and winter terms; freestyle and Greco wrestling spring term. All levels.
This course is repeatable for 11 credits.

PAC 293. INTERDISCIPLINARY YOGA. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Equivalent to: PAC 293H
This course is repeatable for 11 credits.

PAC 293H. INTERDISCIPLINARY YOGA. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAC 293
This course is repeatable for 11 credits.
PAC 294. YOGA I. (1 Credit)
Principles and practice of basic yoga postures, techniques of posture alignment, yogi breathing styles and their impact on the body and mind. Students will be exposed to a variety of forms of yoga, as well as basic yoga philosophy.
This course is repeatable for 11 credits.

PAC 295. YOGA II. (1 Credit)
Building off Yoga I, this is an intermediate level course meant to develop a deeper understanding of yoga practice.
Equivalent to: PAC 257
This course is repeatable for 11 credits.
Recommended: Yoga I or previous yoga experience.

PAC 296. VINYASA YOGA. (1 Credit)
Dynamic flow that connects movement and breath encouraging meditation in motion. May include sustained yoga postures.
Equivalent to: PAC 257
This course is repeatable for 11 credits.
Recommended: Yoga I or previous yoga experience

PAC 297. YOGATHON. (1 Credit)
Expands on knowledge and skills learned in Yoga I or Fitness Yoga through three to five class sessions, each 3-6 hours; longer sessions provide students with an intensive mental and physical experience centering on the concepts of yoga; includes introductory relaxation and meditation skills.
This course is repeatable for 11 credits.
Recommended: PAC 294 and PAC 295 and PAC 296 and (Yoga I or Fitness Yoga)

PAC 298. RESTORATIVE YOGA. (1 Credit)
An emphasis on floor postures, supported postures, and longer holds that cultivate a relationship with ease. Techniques will be used to help students facilitate greater personal awareness. Students will use self reflection practices for personal well-being.
This course is repeatable for 11 credits.

PAC 299. SPECIAL TOPICS. (1-3 Credits)
Advanced information, skills, practice, and application; experimental and new classes. May have additional fee.
This course is repeatable for 11 credits.
Recommended: Intermediate to advanced skills in an activity area

PAC 300. ALI: HIKING LOCAL TRAILS. (1 Credit)
Covers the fundamentals of hiking as a recreational activity and an outdoor travel skill. Content will cover local trails, place history, hiking techniques, clothing and equipment selection, elemental first aid and safety concerns, leave-no-trace principles, and map basics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 301. ALI: CHALLENGE COURSE EXPERIENCE. (1 Credit)
Emphasis on gaining practical experience and understanding of various components that occur in challenge course activities/programs; group dynamic mental and physical challenges; cooperative games and initiatives that promote communication, problem solving skills and leadership; Low and High challenge course activities that promote self-confidence and agility. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 302. ALI: CHALLENGE COURSE PRACTICES AND FACILITATION. (1 Credit)
Covers the set up and facilitation of various challenge course low and high course elements as they pertain to ALI's Challenge Course programming. Students will learn facilitation skills, risk management concepts, operational procedures, and technical rescue skills. A passing grade in this course will result in a certificate of completion from the OSU ALI Challenge Course. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 301 with C- or better
This course is repeatable for 11 credits.
Recommended: Climbing wall instructor, efficient climbers toolbox, self-rescue

PAC 303. ALI: CAMP CRAFT. (1 Credit)
Provides basic front-country camping skills such as packing, trip planning, how to dress for different climates/weather, storm-proofing, knife and axe techniques and safety, stove and kitchen operations, and fire building. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 304. ALI: BACKPACKING. (1 Credit)
Hiking and camping while carrying all gear; tent set-up, camp site selection, operation of single-burner stoves, loading a backpack, water infiltration, navigation, proper hiking technique, energy conservation; leave-no-trace principles in every aspect of the trip and class; includes classroom instruction and required overnight trip. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 307. ALI: RAFTING. (1 Credit)
An introduction to white water rafting. Students will learn the fundamentals of safe rafting, trip planning and become familiar with the gear associated with rafting. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 308. ALI: CANOEING. (1 Credit)
Designed as an introduction to canoeing. Students learn the fundamentals of safe canoeing, trip planning and become familiar with the gear associated with rafting. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 309. ALI: KAYAKING I. (1 Credit)
Focuses on developing technical kayaking skills in flat water and moving water up to Class I. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 311. ALI: STAND UP PADDLEBOARD. (1 Credit)
Covers the curriculum for level 1 and 2 American Canoe Association standup paddle board skill courses. Skills include equipment, environmental factors, techniques, preparation and planning, emergency management, and environmental ethics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 313. ALI: CANYONEERING. (1 Credit)
Students will learn the fundamentals of canyoneering, including efficient hiking techniques, safe anchoring, delaying and rappelling techniques, and environmental mitigation skills. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.
PAC 314. ALI: BOULDERING. (1 Credit)
Introduction to the sport of bouldering, a subset of rock climbing using an indoor climbing facility; emphasis on safety, spotting, climbing movement, training techniques and improvement; provides activities that promote muscular strength and endurance, flexibility, and cardiovascular endurance. PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.

PAC 315. ALI: ROCK CLIMBING I. (1 Credit)
Physical conditioning for, and instruction in, the skills and techniques of rock climbing; environmental impact issues; held at on-campus indoor climbing center. PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.

PAC 316. ALI: ROCK CLIMBING II. (1 Credit)
Focuses on developing technical climbing skills related to lead climbing and anchor construction. Includes a one-day outdoor experience. PAC courses may not be used to fulfill upper-division requirements. 
Prerequisites: PAC 315 with C- or better 
This course is repeatable for 11 credits.

PAC 317. ALI: ROCK CLIMBING III. (1 Credit)
Focuses on developing technical climbing skills in an outdoor setting. Includes a weekend long outdoor experience and cover skills ranging from building anchors using natural protection, to advanced outdoor movement skills. PAC courses may not be used to fulfill upper-division requirements. 
Prerequisites: PAC 315 with C- or better and PAC 316 [C-] 
This course is repeatable for 11 credits. 
Recommended: Intermediate to advanced skills in an activity area

PAC 319. ALI: TECHNICAL RAPPELLING. (1 Credit)
Students will learn, practice and hone their skills in the art of technical rappelling. Introduces many different styles, techniques and equipment used for rappelling in a variety of situations. Throughout the course, students will be provided with simple to advanced challenges to overcome. PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.

PAC 320. ALI: MOUNTAINEERING I. (1 Credit)
Snow climbing techniques, anchoring, belaying and rappelling techniques, snow camping/living skills, and wilderness ethics; classroom instruction and required overnight alpine trip. PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.

PAC 321. ALI: MOUNTAINEERING II. (1 Credit)
Building on skills learned in Mountaineering I; rope team/glacier travel experience, fundamentals of crevasse rescue, advanced snow climbing techniques, safe anchoring, belaying and rappelling techniques, snow camping/living skills, and wilderness ethics. PAC courses may not be used to fulfill upper-division requirements. 
Prerequisites: PAC 320 with C- or better 
This course is repeatable for 11 credits.

PAC 322. ALI: ICE CLIMBING. (1 Credit)
Students will learn the fundamentals of ice climbing, including efficient ice climbing techniques, safe anchoring, belaying and rappelling techniques and wilderness ethics. PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.

PAC 323. ALI: MOUNTAIN RESCUE BASICS. (1 Credit)
Focuses on developing technical skills in a mountain rescue system. PAC courses may not be used to fulfill upper-division requirements. 
Prerequisites: PAC 320 with D- or better 
This course is repeatable for 11 credits.

PAC 324. ALI: WHITE WATER RESCUE. (1 Credit)
Provides an introduction to white water rescue; students learn the fundamentals of white water rescue, scene management, and the necessary gear to perform rescues. PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.

PAC 325. ALI: WILDERNESS FIRST AID. (1 Credit)
Fundamentals of emergency care in a non-urban environment including anatomy, physiology, injury assessment, short-term care, small-group rescues; backcountry emphasis with long-term care and evacuation complications. PAC courses may not be used to fulfill upper-division requirements. 
Equivalent to: PAC 325H 
This course is repeatable for 11 credits.

PAC 325H. ALI: WILDERNESS FIRST AID. (1 Credit)
Fundamentals of emergency care in a non-urban environment including anatomy, physiology, injury assessment, short-term care, small-group rescues; backcountry emphasis with long-term care and evacuation complications. PAC courses may not be used to fulfill upper-division requirements. 
Attributes: HNRS – Honors Course Designator 
Equivalent to: PAC 325 
This course is repeatable for 11 credits.

PAC 326. ALI: BUSH CRAFT. (1 Credit)
Basic wilderness living techniques, knowledge and skills needed for a student to be ethical and efficient, and have the ability to survive in the outdoors. Special emphasis is placed on building shelters, water purification, navigation, awareness, fire, self-sufficiency and caring for groups in the wilderness. PAC courses may not be used to fulfill upper-division requirements. 
Prerequisites: PAC 303 with D- or better 
This course is repeatable for 11 credits.

PAC 327. ALI: ROCK GUIDE SCHOOL. (1 Credit)
Serves as an opportunity to learn the skills for being a rock guide for the ALI. With five days of training and practice in the field at two climbing sites in Oregon, it serves to help students understand the unique challenges of instructing climbing in the outdoor environment. This course may end with Sport Climbing Instructor certification through the Professional Climbing Instructors of America. PAC courses may not be used to fulfill upper-division requirements. 
Recommended: Efficient climbers toolbox, self-rescue, climbing wall instructor–lead certification

PAC 328. ALI: RAFT GUIDE SCHOOL. (1 Credit)
Provides students the skills and guided practice time needed to become competent paddle raft guides. It is a nine-day course that focuses on the development of water reading, raft maneuvering, risk management, and whitewater rescue skills needed by raft guides. Successful completion of the course will result in a certificate of completion from the American Canoe Association (ACA). PAC courses may not be used to fulfill upper-division requirements. 
This course is repeatable for 11 credits.
Physical Therapy/Therapist

PT 700. PROFESSIONALISM AND INTERPROFESSIONAL PRACTICE. (2 Credits)
Introduction to the role of the professional in physical therapy practice. Topics of application include communication, professional behavior and abilities, ethics, legal issues, and responsibility for professional development.

PT 711. ANALYTICAL ANATOMY AND IMAGING. (4 Credits)
Detailed kinesiologic analysis of appendicular, spine, head, neck, and face muscles. Lecture, clinical demonstration, and practical experiences.

PT 712. NEUROANATOMY AND NEUROSCIENCE. (5 Credits)
Organized approach to structures in the brain, spinal cord and peripheral nervous systems. Detailed analysis of Neurophysiologic mechanisms underlying normal and abnormal motor sensory function.

PT 713. MUSCULOSKELETAL ANATOMY. (6 Credits)
Musculoskeletal anatomy, innervation, blood supply, and function: intensive study of the head, neck, trunk, and limbs.

PT 716. CULTURAL COMPETENCE IN PHYSICAL THERAPY. (2 Credits)
An exploration of how cultural competence is a critical core component of professional practice in physical therapy and should be considered as a part of the best practice in providing physical therapy care.

PT 717. GERIATRICS IN PHYSICAL THERAPY. (2 Credits)
An overview of the Physical and Psycho-Behavior aspects of aging in adulthood. An introduction to usual and pathological changes and treatment issues relevant to older patients.

PT 718. PSYCHOSOCIAL ASPECTS OF DISABILITY. (2 Credits)
A study of behavior, social structures and beliefs, and interaction patterns to support the scientific basis of the effective interactions of physical therapists with patients.

PT 719. PHYSICAL THERAPY IN RURAL COMMUNITIES. (2 Credits)
An overview of major issues in the rural health care system and the environment in which physical therapists, as rural health clinicians, must function. Provides students with an understanding of the healthcare delivery system in rural America with a concentration on the diverse populations of the Northwest region of the United States.

PT 720. MOTOR DEVELOPMENT. (3 Credits)
Examination of normal development of gross motor, fine motor, language, cognition, psychosocial, and play skills across the lifespan from in utero to young adulthood.

PT 721. MOTOR CONTROL AND LEARNING ACROSS THE LIFE SPAN. (4 Credits)
Introduction to sensorimotor systems, overview of current perspectives in motor control and learning from fetus through late adulthood, and clinical tests of motor proficiency.

PT 722. PREVENTION WELLNESS AND POPULATION HEALTH. (3 Credits)
A study of the development of wellness plans for individuals or families in the community. Students will learn to assess family health care needs, seek out community resources, and educate community members on specific issues related to their own health and well-being.

PT 730. APPLIED PHYSIOLOGY. (3 Credits)
Selected subjects in cellular and systems physiology. Emphasis on molecular and cellular aspects of neuromuscular function, also renal and endocrine physiology.

PT 731. CLINICAL EXERCISE PHYSIOLOGY. (4 Credits)
Adaptation of the human body to exercise and the use of exercise to modify human function.

PT 740. THERAPEUTIC EXERCISE I. (3 Credits)
Theoretical principles for evaluation of exercise need and prescription of exercise programs. Emphasis on approaches for patients with musculoskeletal deficits.

PT 741. THERAPEUTIC EXERCISE II. (3 Credits)
Examination of needs analysis and prescription of exercise programs for special patient populations and assessment of current community trends in exercise and wellness.

PT 743. BUSINESS AND ADMINISTRATION IN PHYSICAL THERAPY. (3 Credits)
Examination on the factors affecting patients entry into and progression through the healthcare system, including the effect of current financial, legal and regulatory policies that affect the patient, the patient/professional relationship, and the practice of physical therapy. Provides an overview of primary business disciplines including market research and strategy, marketing, finance, operations, and management.

PT 745. BASICS OF PATIENT MANAGEMENT. (1,6 Credits)
Development of basic decision-making skills, professional behaviors and impairment assessment in patients with musculoskeletal, neurologic and/or cardiopulmonary dysfunction.

PT 746. DISORDERS OF THE MUSCULOSKELETAL SYSTEM. (3 Credits)
Regional description of pathology and pathophysiological mechanisms of disorders of bone, connective tissue, and joints.

PT 748. THERAPEUTIC MODALITIES. (3 Credits)
An introduction to the management of pain and dysfunction using thermal, electrical and mechanical modalities used by Physical Therapists in general practice.
PT 750. CLINICAL BIOMECHANICS & GAIT. (5 Credits)
Introduction to the principles of biomechanics as they apply to physical therapy practice. Emphasis on joint structure and function and tissue mechanics. Introduction to both normal and pathological gait including examination of joint kinematics, kinetics, and muscle activity.

PT 752. PROSTHETICS AND ORTHOTICS. (3 Credits)
The examination of pathological gait of patients using prosthetic and orthotic devices. The course emphasizes types of orthotic and prosthetic devices, assessments, reassessment and corrections of gait deviations using therapeutic interventions geared toward functional interventions, patient/family education, exercises, and balance and coordination techniques.

PT 760. PHARMACOLOGY. (2 Credits)
The study of prescription and/or over-the-counter medications used in the management of a variety of patient conditions encountered during physical therapy management.

PT 761. RESEARCH METHODS AND EVIDENCE BASED PRACTICE. (2 Credits)
Introduction to evidence based practice, scientific methods, and clinical research methodologies.

PT 780. DIFFERENTIAL DIAGNOSIS. (4 Credits)
Consideration of principles of differential diagnosis with emphasis on mastering this skill.

PT 791. MANAGEMENT OF CARDIOVASCULAR DYSFUNCTION. (2 Credits)
Physical therapy evaluation and intervention in the care of patients with circulatory, cardiac, or pulmonary dysfunction.

Public Health

H 100. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.
Equivalent to: H 100

H 100H. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 100

H 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

H 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 210. *INTRODUCTION TO THE HEALTH CARE SYSTEM. (3 Credits)
Provides tools to understand and critically assess the health care delivery system, its components, and the challenges created by its structure. The health care system will be considered from the perspective of several main players [e.g., patients, hospitals, doctors, health plans]. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 220. INTRODUCTION TO HEALTH DATA ANALYSIS. (3 Credits)
Introduction to the application of biostatistics and probability to the health sciences. Topics include quantitative analysis and inference, statistical methods in the biosciences, and quantitative study to evaluate and control health problems.
Recommended: MTH 105 or MTH 111 or higher mathematics.

H 225. *SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS. (4 Credits)
Overview of the macro (social/system/environmental) and micro (individual) contributors to premature disease, disability and population health. Selected behavioral theories supporting health risks and strategies for the prevention of premature disease/disability and the promotion of health. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 250. INTRODUCTION TO HEALTH CARE MANAGEMENT. (3 Credits)
Participants will learn key principles, practices and personalities of health care management. The content is broadly applicable to health care enterprises of every kind: public health organizations, physician practices and clinics, hospitals and health systems, agencies and service organizations, for-profit firms, not-for-profit enterprises, etc.
Prerequisites: H 210 (may be taken concurrently) with C- or better

H 309. PRACTICUM IN HEALTH CARE SERVICES. (3-6 Credits)
Supervised work experience in a health care service setting or health-related agency or program. Weekly progress reports and post-experience summary report and evaluation will be expected. Preplanned with instructor approval. Open to health care administration majors. Graded P/ N.
This course is repeatable for 12 credits.

H 310. HEALTH FIELD EXPERIENCES. (3-6 Credits)
Introductory field experience in a health or health-related worksite. Graded P/N.
Prerequisites: H 210 with C- or better
This course is repeatable for 12 credits.

H 312. *HIV/AIDS AND STIS IN MODERN SOCIETY. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of AIDS and other sexually transmitted diseases in contemporary society; emphasis on social, psychological, legal, economic, and ethical issues surrounding these diseases. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: H 312H

H 319. INTRODUCTION TO HEALTH POLICY. (3 Credits)
Describe the policy development process, including problem conceptualization, agenda setting, role of interest groups and public opinion, analysis of alternatives and selection of policy alternative.
Prerequisites: H 210 with C- or better and PS 201 [C-]

H 320. INTRODUCTION TO HUMAN DISEASE. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of communicable and noncommunicable diseases in human populations. Special emphasis on disease prevention and health promotion in the high risk diseases of modern, industrialized society.

H 333. *GLOBAL PUBLIC HEALTH. (3 Credits)
Introduction to the field of global health, its history, methods, and key principle; understanding global health inequities through case studies; overview of major global health prevention programs. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 344. *FOUNDATIONS OF ENVIRONMENTAL HEALTH. (3 Credits)
Introductory course examining environmentally-linked disease, and health effects associated with toxic substances, food quality, pesticides, air, water, and noise pollution, and solid/hazardous wastes.
H 349. PEER HELPER SKILLS DEVELOPMENT. (3 Credits)
Prepares the student for an active role as a peer helper in alcohol and drug abuse prevention and health education. Course work will include: drug, alcohol, addiction and other related health issues, basic listening and communication skills, conflict resolution, crisis recognition and referral. A major component will be affective learning situations designed to promote self-awareness and personal growth.

H 364. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual’s value orientation, decision-making, and self-responsibility in treatment and educational approaches to prevention.

Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364H

H 364H. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual’s value orientation.

Attributes: HNRS – Honors Course Designator
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364

H 376. EVIDENCE-BASED HEALTH PROMOTION. (3 Credits)
Emphasis on the Occupational Safety and Health Act; study includes the scope and duties under the act, enforcement, and adjudication procedures and OSHA litigation; components of Oregon-OSHA.

Prerequisites: H 100 with C- or better and H 225 [C-]

H 385. SAFETY AND HEALTH STANDARDS AND LAWS. (3 Credits)
Emphasis on the Occupational Safety and Health Act; study includes the scope and duties under the act, enforcement, and adjudication procedures and OSHA litigation.

Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option

H 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 407. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world.

Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option

H 407H. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world.

Attributes: HNRS – Honors Course Designator
Equivalent to: H 407

H 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 409. PRACTICUM. (1-6 Credits)
Supervised work experience in a public health or health care administration setting. Open to majors in public health. Graded P/N.

This course is repeatable for 16 credits.

H 410. INTERNISHIP. (1-12 Credits)
Directed field experience with participation in a community, worksite, or health agency program. Experience is individually arranged to meet student needs. Graded P/N.

Prerequisites: H 407 with C- or better
This course is repeatable for 24 credits.

Recommended: H 436 (for HMP students). H 225 and H 320 and H 476 (for HPHB students)

H 418. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Current ethical issues in public health, including gender and ethnicity in employment, pharmaceutical controls, product liability, advertising, and export of high technology.

H 421. MENTAL HEALTH. (3 Credits)
Examination of social, governmental, legal and individual mental health issues. Brief overview of some major mental disorders.

Prerequisites: H 225 with C- or better and H 320 [C-]

H 422. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging.

Recommended: 9 credits of health course work.

H 425. FOUNDATIONS OF EPIDEMIOLOGY. (3 Credits)
Measures of disease frequency; measures of effect; association and causation; sources of inaccuracy; experimental and observational study designs. Lec/rec.

Prerequisites: H 220 with C- or better or ST 201 with C- or better or ST 314 with C- or better or ST 351 with C- or better
H 431. HEALTH CARE MARKETING. (3 Credits)
Principles, elements and methods of marketing health care services. Role of the consumer, governing body, administration and medical staff as well as impact of professional ethics.

H 432. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economic principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.
Prerequisites: (ECON 201 with C- or better or ECON 201H with C- or better) and H 210 [C-]

H 434. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 210 with C or better and H 250 [C-]

H 436. ADVANCED TOPICS IN HEALTH CARE MANAGEMENT. (3 Credits)
Covers how health services are governed and organized; how health care organizations assess and adapt to change; constraints/opportunities in shaping organizational performance; leadership; strategic decision-making and the use of evidence-based management in health care.
Prerequisites: H 210 with C- or better and H 250 [C-]

H 445. OCCUPATIONAL HEALTH. (3 Credits)
Current and historical topics in the area of occupational health, with particular emphasis on the types of materials that produce human health effects; clinical and epidemiologic data used to assess the public health importance of occupational pollutants and to evaluate control strategies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

H 448. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Prerequisites: H 344 with C- or better
Recommended: One term of basic chemistry

H 449. MASS MEDIA AND HEALTH. (3 Credits)
Designed to examine the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public-health campaigns.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 457. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Prerequisites: BA 215 with C- or better and H 210 [C-] and H 250 [C-]

H 458. REIMBURSEMENT MECHANISMS. (3 Credits)
Introduces and analyzes the different types of healthcare reimbursement methodologies used in the U.S. health care system.
Prerequisites: H 210 with C- or better

H 461. SEXUALITY: A HEALTH SCIENCE PERSPECTIVE. (3 Credits)
Exploration of the meaning of sexuality from a variety of contemporary health science perspectives; aspects of sex and sexuality fundamental to total health; issues central to the health educator role examined.

H 465. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women's health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Recommended: 6 credits in public health.

H 467. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 468. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 474. PUBLIC HEALTH AND VIOLENCE IN SOCIETY. (3 Credits)
Examination of violence as a major public health issue. Historical, social, environmental, economic, behavioral and psychological aspects of assaultive violence, spousal abuse, rape and sexual assault, child abuse, child sexual abuse, suicide, the effects of the media on violence, drug abuse and violence, and related public health problems in contemporary American society. Emphasis on health and the efficacy of current efforts aimed at ameliorating these problems and potential for alternative public health models for prevention and intervention.

H 476. PLANNING AND EVALUATING HEALTH PROMOTION PROGRAMS. (4 Credits)
A systematic approach to planning, implementing and evaluating health promotion programs in a variety of health related settings. Students will be writing a series of drafts to effectively develop a health promotion program plan. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 225 with C- or better and H 320 [C-]

H 477. DIETARY INTERVENTIONS FOR PUBLIC HEALTH. (3 Credits)
A public health perspective on the practice of population-based dietary intervention. Examination of relevant theories, research, and practice that pertain to health promoters/educators.
Prerequisites: NUTR 225 with C- or better
Equivalent to: NUTR 477

H 480. UNDERGRADUATE EOH SEMINAR. (1 Credit)
Explores current topics in environmental health and safety. EOH faculty will discuss their current research interests; EOH graduate student speakers will share their environmental health and safety internship experiences. Documentaries will be viewed to introduce topics of discussion. Features will be discussions relating directly to ongoing, current environmental/occupational health crises, both in the United States and around the world. Graded P/N.
This course is repeatable for 2 credits.

H 489. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.
H 491. SELECTED TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.
Equivalent to: H 491H
This course is repeatable for 6 credits.

H 491H. SPECIAL TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.

Attributes: HNRS – Honors Course Designator
Equivalent to: H 491
This course is repeatable for 6 credits.

H 494. APPLIED ERGONOMICS. (3 Credits)
Principles of occupational ergonomics for managing optimal worker performance and well-being.

H 495. DESIGN FOR ENVIRONMENT, SAFETY, AND HEALTH. (3 Credits)
Systematic consideration of environmental, safety, and health concerns at the earliest possible stage in the lifecycle design engineering of products, technologies, and manufacturing processes.

H 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

H 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 507. SEMINAR. (1-16 Credits)
Section 1. Internship (1). Graded P/N.
This course is repeatable for 16 credits.

H 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 509. PRACTICUM. (1-16 Credits)
Supervised work experience in a public health or health care administration setting. Open to majors in public health. Graded P/N.
This course is repeatable for 16 credits.

H 510. INTERNSHIP. (1-16 Credits)
Directed field experience with participation in a community, worksite, or health agency program. Experience is individually arranged to meet student needs. Graded P/N.
This course is repeatable for 16 credits.

H 511. COMMUNITY, CULTURE, AND GLOBAL HEALTH. (3 Credits)
Overview of health issues across cultures, ethnic groups, and regional/national boundaries from a critical and interdisciplinary perspective. Special emphasis on understanding social and behavioral factors that influence health in underserved communities/groups, especially ethnic/racial minorities, women, children, and migrants.

H 512. INTRODUCTION TO ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES. (3 Credits)
Introduction to environmental and occupational health. Hazards affecting human health are examined in the context of current social, political and regulatory pressures.

H 513. INTEGRATED APPROACH TO PUBLIC HEALTH. (12 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health.

H 514. ENVIRONMENT, SAFETY AND HEALTH SEMINAR. (1 Credit)
One-credit graduate seminar on current topics of interest and importance to the environmental health and occupational safety field. Critical reading of research publications, discussion of controversial issues facing ESH professionals, and/or presentation of current ESH research.
This course is repeatable for 3 credits.

H 515. RESEARCH METHODS IN SOCIAL AND BEHAVIORAL HEALTH SCIENCES. (3 Credits)
Provides an introduction to quantitative research methods and design. Topics include definition of research problems and questions, hypothesis generation, research design, sampling, variable definition and measurement, data collection, and ethical considerations. Also provides a brief introduction to qualitative and mixed methods.

H 516. RESEARCH METHODS IN GLOBAL HEALTH. (3 Credits)
Overview of research methods used to understand health, illness, health care, and health-seeking behavior in international settings. Special emphasis on the use of qualitative and mixed methods in international health research.

H 518. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Explores key ethical issues in the context of public health practice; codes and guidelines for ethical conduct of public health practice; issues related to social accountability, vulnerable populations, and ethical framework for community engagement.

H 519. DISPLACEMENT, MIGRATION, AND GLOBAL HEALTH. (3 Credits)
Critical examination of health of displaced/migrant populations with an emphasis on health disparities and social determinants. Understanding intersections of humanitarianism, migration, vulnerability, and displacement from a global health perspective.

H 520. HEALTH DISPARITIES. (3 Credits)
Health disparities based on race/ethnicity, culture, social class, and rural/urban residence, among others; strategies to reduce disparities, promote health, and prevent disease in diverse populations.

H 521. MENTAL HEALTH. (3 Credits)
Focus upon mental health policy development, in relation to federal and state government services and regulations, implementation of services.

H 522. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging. Recommended: 9 credits of public health course work.

H 523. FOUNDATIONS OF PUBLIC HEALTH. (4 Credits)
Fundamental principles, concepts and tools used in public health to promote the health of populations. Using a combination of case study method, lecture and discussion, students will develop a broad understanding of public health and recognition of how discipline-specializations address the social, behavioral and environmental determinants of public health.
H 524. INTRODUCTION TO BIOSTATISTICS. (4 Credits)
Quantitative analysis and interpretation of health data including probability distributions, estimation of effects, and hypothesis-tests such as Chi-square, one-way ANOVA, and simple linear regression.

H 525. EPIDEMIOLOGICAL METHODS I. (3 Credits)
Introduction to the concepts and methods of epidemiology. Topics include measures of population health, screening, study design, measures of association, and interpretation of epidemiological data.
Prerequisites: H 513 with B- or better or H 535 with B- or better

H 526. EPIDEMIOLOGIC METHODS II. (3 Credits)
Concepts and methods of epidemiological analysis; standardization; stratified analysis; confounding and its control; planning and conducting epidemiologic research; role of multivariate analysis in epidemiologic research.
Prerequisites: H 524 with B- or better and H 525 [B-]

H 527. CRITICAL ASSESSMENT OF INTERNATIONAL HEALTH PROGRAMS. (3 Credits)
Introduces the critical evaluation framework of assessing international health development programs, based on self-determination and community ownership principles. The framework of assessment method includes three levels: upstream evaluation, midstream evaluation, and downstream evaluation.
Recommended: H 528 and H 529

H 528. GLOBAL HEALTH ISSUES. (3 Credits)
Examines major issues in health developments of global significance, their causes and impacts on international health, and methods and strategies to address them.

H 529. INTERNATIONAL HEALTH. (3 Credits)
Overview of the epidemiological, economic, political, sociological, and cultural factors that impact on international health. Special emphasis on the methods of prevention/intervention utilized in coping with health problems on an international level.

H 530. HEALTH POLICY ANALYSIS AND POLITICS. (3 Credits)
Examination of current health policy issues affecting health care programs, services, and organization as well as the role of politics in public health and health policy. Exploration of processes by which health policy proposals are generated, promoted, defeated, modified and implemented.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 532. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economics principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.
Recommended: ECON 201

H 533. HEALTH SYSTEMS ORGANIZATION. (3 Credits)
Examines the nature of health and health care services and reviews the role of government and the free market on health services. Alternative ways of organizing, financing, and delivery of health care services are explored.

H 534. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access.

H 535. INTERPRETING EPIDEMIOLOGIC EVIDENCE. (3 Credits)
Intended for students in the human sciences and allied health fields. Introduces basic epidemiology concepts. Topics will include measures of disease frequency, assessing population health, causal logic, quantifying associations between exposures and health outcomes, epidemiologic study design, and threats to study validity (random error, bias, confounding). Examples focus on application of epidemiological methods to a variety of health-related fields.

H 536. HEALTHCARE ORGANIZATION LEADERSHIP THEORY AND BEHAVIOR. (3 Credits)
Overview of organization theory and behavior in health care organizations. Emphasis is on developing an understanding of the factors and forces that influence the structures, behaviors, and operations of health care delivery organizations. This understanding will be developed through consideration of organizations, their environments, and the roles of individuals working in management.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 537. INJURY EPIDEMIOLOGY. (3 Credits)
An overview of the distribution and determinants of injuries, methodological issues specific to injury epidemiology, and approaches to injury control.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 513 with B- or better
Recommended: Graduate epidemiology training

H 538. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, and their financial reimbursement mechanisms.

H 540. WATER AND HUMAN HEALTH. (3 Credits)
Critically examine the complex relationship between water quality, human activities, and population health.

H 541. AIR QUALITY AND HUMAN HEALTH. (3 Credits)
Examination of the major sources of air pollution, its impact on ecosystems and climate change, and population health. Will also discuss technologies and introduce regulations that are used to control air pollutants.

H 542. ENVIRONMENTAL AND OCCUPATIONAL HEALTH RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern environmental and occupational risk analysis and how they are utilized to make evidence-based decisions by regulatory agencies.

H 543. EXPOSURE SCIENCE I. (4 Credits)
Overview of the concepts, principles and practices in modern environmental and occupational exposure assessment. Exposure Science I provides a broad introduction to environmental and occupational exposure assessment methods, while Exposure Science II focuses on sampling and measurement methods.

H 544. ENVIRONMENTAL AND OCCUPATIONAL EPIDEMIOLOGY. (3 Credits)
Examines exposure assessment methodology and epidemiological study designs that are commonly used in environmental and occupational health science in order to characterize the impact of environmental and occupational exposures on population health.
Prerequisites: H 525 with C or better
Recommended: Graduate level statistics course
H 546. PHYSICAL AGENTS AND HUMAN HEALTH. (3 Credits)
Focus on physical agents (heat, noise, vibration, radiation) and health risks associated with these agents. It covers the range and sources of exposure to physical agents, methods of characterizing these exposures, effects on human health, and the regulations/standards that set limits for physical agents. Lec/lab.

H 547. GIS AND PUBLIC HEALTH. (4 Credits)
Applications of geographic information systems (GIS) to public health are reviewed, including mapping, spatial analysis methods, estimating access, and exposure assessment. This course is geared toward individuals involved in public health who have no (or introductory level) knowledge of GIS. Lec/lab.

H 548. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Recommended: H 344 with a grade of C- or better and one term of basic chemistry.

H 549. MASS MEDIA AND HEALTH. (3 Credits)
Examines the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public health campaigns.
Prerequisites: H 571 with C or better

H 550. SOCIAL EPIDEMIOLOGY. (3 Credits)
Explores the social determinants of health at the population level. Primary focus is on introduction to methods specific to social epidemiology, but will also provide an overview of current understanding of the empirical associations between social factors and health.
Prerequisites: H 525 with B or better
Recommended: Introductory course in epidemiology

H 551. APPLIED EPIDEMIOLOGICAL ANALYSIS OF SECONDARY DATA. (3 Credits)
Practical experience performing a hypothesis-driven epidemiological analysis utilizing secondary surveillance or other appropriate data set, writing an analytical plan, appropriate programming for the analysis (using STATA or SAS), understanding the analysis output, preparing tables, and interpreting results.
Prerequisites: H 526 with B- or better and H 560 [B-] and H 580 [B-]

H 552. DISASTER EPIDEMIOLOGY. (3 Credits)
Describe the impact of natural and manmade disasters on human health, understand epidemiologic methods specific to disasters, and apply fundamental epidemiologic methods to identify and characterize disaster-related adverse health outcomes.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 554. EPIDEMIOLOGY OF AGING. (3 Credits)
An overview of the core principles of the epidemiology of aging is provided. There will be an emphasis on health and disease processes in older adults. Students will learn essential study design and analytic issues that may arise in studies of aging.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 555. CANCER EPIDEMIOLOGY. (3 Credits)
Introduction to basic concepts and methodology in cancer epidemiology.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better

H 556. STRATEGIC MANAGEMENT OF HEALTH SERVICE ORGANIZATIONS. (3 Credits)
Theories and methodologies of long-range planning and strategic management in health care organizations.

H 557. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Recommended: H 210 and H 250

H 558. REIMBURSEMENT MECHANISMS. (3 Credits)
Techniques used in cost-effectiveness analysis. Examples are drawn from the public health and health economics literature.

H 560. PUBLIC HEALTH SURVEILLANCE. (3 Credits)
An introduction to public health surveillance systems (national and international) for chronic and infectious diseases. Utility of existing surveillance systems for secondary epidemiological data analysis.
Prerequisites: H 524 with B- or better and H 525 [B-]

H 562. INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Understand epidemiologic methods specific to infectious diseases, apply fundamental epidemiologic methods to infectious disease questions, and describe the broad trends in global infectious disease burden. The application methods and principles will be explored through lectures, discussions, assignments and writing projects.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or H 514 with B- or better

H 563. PHYSICAL ACTIVITY EPIDEMIOLOGY. (3 Credits)
Physical activity epidemiology will focus on current research, controversial issues, and methodological problems in the epidemiology of physical activity, exercise, and health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 564. COMPUTING TOOLS AND HEALTH DATA ANALYSIS. (3 Credits)
Modern computational biostatistics for analyzing health data, emphasizing important technologies and methods for data processing and understanding of how they work. Topics will evolve over time as new procedures are developed.
Corequisites: H 524

H 565. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women’s health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability.
Equivalent to: BA 565
Recommended: 6 credits in public health.

H 566. DATA MINING IN PUBLIC HEALTH. (3 Credits)
An introduction to high-dimensional data analysis and data mining techniques used as an information technology tool to extract previously unknown and potentially useful information from large databases in biology, medicine, and public health.
Recommended: H 581 and H 564

H 567. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.
H 568. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 569. MATERNAL AND CHILD HEALTH. (3 Credits)
Women's reproductive health and health of children stressing causation, management, and prevention of public health problems. Epidemiological analysis of morbidity and mortality in children and women of childbearing age; impact of social, political and economic influences on the health of women and children; comparison of issues and problems of industrialized versus developing nations. Consideration of health issues of interest to the many diverse racial and ethnic groups of women and children in the U.S. as well as the global village.

H 571. PRINCIPLES OF HEALTH BEHAVIOR. (3 Credits)
Theoretical approaches to behavior change in health promotion/education research and practice; factors influencing health behaviors, ethical behavior change issues, behavioral interventions for special populations.

H 572. COMMUNITY ORGANIZATION FOR HEALTH PROMOTION AND EDUCATION. (3 Credits)
History, theory, and practice of community organizing for health advocacy; focus on group processes, use of media, leadership, coalitions, grass roots methods and social change.

H 573. INTRODUCTION TO MULTILEVEL/HIERARCHICAL MODELS. (3 Credits)
Introduction to the theory and application of hierarchical models to problems in epidemiology and public health. Hierarchical models will be dealt with using both frequentist and Bayesian frameworks.

Recommended: H 581

H 575. EVALUATION OF HEALTH PROMOTION AND EDUCATION PROGRAMS. (3 Credits)
Provides theoretical and practical bases for program evaluation. Develops basic skills in a variety of approaches to evaluation, including techniques that are particularly suitable for evaluating health promotion, community health improvement, and related health and social services programs. Course learning is synthesized through designing an evaluation framework and methodology for a relevant program.

Prerequisites: H 513 with B- or better or H 515 with B- or better or HHS 514 with B- or better

H 576. PROGRAM PLANNING FOR HEALTH/HUMAN SERVICES. (4 Credits)
Provides students with an introduction to the principles of program planning and the development of program plans, with a focus on evidence-based public health/human services. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a program plan.

Prerequisites: (H 515 with C- or better or HHS 514 with C- or better) and H 571 [C-] and H 575 [C-]

H 578. INTRODUCTION TO MOLECULAR EPIDEMIOLOGY I. (3 Credits)
A survey of and introduction to the methods and issues arising in genetics and molecular epidemiology, including key biostatistical methods, study designs, and technologies used in the conduct of these studies. Students will gain experience conducting critical reviews of research papers with respect to study design and biostatistical analysis.

Prerequisites: (H 524 with C or better and H 526 [C])
Recommended: Knowledge of and familiarity with basic concepts of molecular biology (DNA replication, transcription, and translation)

H 580. LINEAR REGRESSION AND ANALYSIS OF TIME TO EVENT DATA. (4 Credits)
Multiple linear regression analysis for measurement data and survival analysis methods for time to event health data, including modes of inference, diagnostics, model selection, and reporting conclusions. Lec/lab.

Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 581. GENERALIZED LINEAR MODELS AND CATEGORICAL DATA ANALYSIS. (4 Credits)
Biostatistical methods focusing on binary and count data will provide a foundation for understanding and implementing generalized linear regression and categorical data models that are commonly used to analyze epidemiological and public health data from cohort, case-control, and clinical trial study designs. Lec/lab.

Recommended: H 580

H 582. ANALYSIS OF CORRELATED HEALTH DATA. (3 Credits)
Biostatistical methods for clustered, repeated measures, and longitudinal correlated health data, with an introduction to applications of linear and generalized linear mixed models and generalized estimating equations.

Prerequisites: H 581 with C or better

H 583. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT. (4 Credits)
Studies the design and management principles and practices in the environment, safety and health field.

H 584. ANALYSIS OF INTERVENTION STUDIES AND CLINICAL TRIALS. (3 Credits)
Principles of data analysis from intervention studies and clinical trials, including professional graphical and tabular presentation, reproducibility and reliability of measurements, and controlling the Type I error rate when analyzing multiple endpoints. Basic principles of designing experiments are also covered including blocking, stratification, interaction, and control of variability.

Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 585. ENVIRONMENT, SAFETY AND HEALTH POLICY AND LAW. (3 Credits)
Survey of the environment, safety and health policy and law in the United States. Furnishes the basic knowledge and general understanding about policy and law-related issues important to all environmental health and safety professionals.

Recommended: H 385

H 586. BAYESIAN BIOSTATISTICS IN PUBLIC HEALTH. (3 Credits)
An examination of methods for designing and implementing Bayesian analysis to address scientific questions through hands-on experience with health data. This survey course also covers proper interpretation and communication of results from practical Bayesian methods for biostatistics data analysis, with illustrations of the utility of Bayesian ideas in public health.

Prerequisites: H 581 with C or better

H 587. TIME TO EVENT ANALYSIS OF HEALTH DATA. (3 Credits)
Biostatistical models and methods for survival analysis of time to event data that are routinely encountered in biomedical and health research.

Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 588. APPLIED OCCUPATIONAL SAFETY AND HEALTH. (3 Credits)
The management and technical aspects of a workplace safety and health program are identified and assessed. Students completing the course receive a 30-hour OSHA General Industry card.
H 589. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.

H 590. OCCUPATIONAL ERGONOMICS AND BIOMECHANICS. (3 Credits)
Examines the advanced theories, applications, and contemporary topics of occupational ergonomics and biomechanics. Topics include muscle physiology, work-related musculoskeletal disorders, assessing biomechanical exposure in the workplace, various material handling assessment tools, 3-Dimensional Static Strength Prediction Program, human vibrations, and implementing ergonomic interventions.

H 591. SELECTED TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.
This course is repeatable for 9 credits.

H 592. SPATIAL EPIDEMIOLOGY. (3 Credits)
An introduction to methods in spatial epidemiology is provided, including spatial exploration of health data, quantifying spatial patterns and clusters, spatial exposure assessment, and explaining patterns and associations.
Prerequisites: H 547 with C or better and H 581 [C]

H 593. REPRODUCTIVE EPIDEMIOLOGY. (3 Credits)
Focuses on current research, controversial issues, and methodological problems in the epidemiology of reproductive health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 594. APPLIED ERGONOMICS. (3 Credits)
Principles of occupational ergonomics for managing optimal worker performance and well-being.

H 595. DESIGN FOR ENVIRONMENT, SAFETY, AND HEALTH. (3 Credits)
Systematic consideration of environmental, safety, and health concerns at the earliest possible stage in the lifecycle design engineering of products, technologies, and manufacturing processes.

H 596. HEALTHCARE EPIDEMIOLOGY. (3 Credits)
Focus on current research, controversial issues, and methodological problems in the epidemiology of healthcare. Topics include institutional infection control, medical errors, screening and diagnostic testing, cost-effectiveness, and others related to the delivery and assessment of healthcare, with a focus on the US healthcare system specifically.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
Recommended: H 524

H 597. METHODS IN FOODBORNE DISEASE OUTBREAK INVESTIGATION. (3 Credits)
Focuses on the practical basis for developing and implementing methods for foodborne disease outbreak detection, investigation and control, using recent outbreaks to highlight underlying principles. Biological characteristics of major foodborne disease pathogens, clinical features of the illnesses its causes and epidemiologic presentations of foodborne outbreaks will be reviewed. The implications of these characteristics will be discussed in a problem solving, interactive format that examines theory and practice in the context of recent outbreaks. Strategies to promote timely decision-making will be emphasized.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 598. HEALTH POLICY ANALYSIS METHODS. (3 Credits)
Analysis of public policies affecting health care programs, services and organizations and the impact of those programs on citizens. Health services research methods, including data sources for health policy research and health policy literature.
Prerequisites: H 513 with B- or better and H 533 [B-]

H 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

H 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

H 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

H 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 611. INTRODUCTION TO SYSTEMATIC LITERATURE REVIEWS. (3 Credits)
Students will learn how to apply systematic review methodology to a research question of their choice and understand how literature reviews inform evidence-based decision-making. Examples will focus on applying literature reviews to public health, clinical science, and biomedical research.

H 612. DOCTORAL SEMINAR IN PUBLIC HEALTH: RESEARCH AND PRACTICE. (1 Credit)
Contemporary research and professional issues specific to the discipline of public health. Includes responsible conduct of research, writing for publication, professional development and leadership, and faculty research in public health.
This course is repeatable for 9 credits.

H 613. INDEPENDENT RESEARCH PROJECT. (1-9 Credits)
Independent research project for PhD students, including research design, execution or research, and the formal presentation of findings in written form. Student will develop an original research topic based on knowledge and review of the literature in a public health-relevant area of inquiry. Graded P/N.
This course is repeatable for 9 credits.

H 614. RESEARCH MANUSCRIPT. (4 Credits)
PhD students write a manuscript to submit to a peer-reviewed journal as part of the course requirements. Graded P/N.

H 615. ADVANCED EVALUATION AND RESEARCH DESIGN. (3 Credits)
Provides an in-depth examination of advanced research designs and methods for establishing causal statements about the efficacy, effectiveness and generalizability of public health and social service interventions designed to alter public health and social risk or protective factors.
Recommended: H 515 and H 575
H 620. ADVANCED TOPICS IN GLOBAL HEALTH INTERVENTION AND PRACTICE. (3 Credits)
Examines the processes and tools involved in planning and evaluating culturally competent health and human service prevention and intervention programs in the global context. Special considerations in program decision-making in the global context (community engagement, cultural competence, sustainability, feasibility, political/ethical issues) will be explored. Provides a key forum for doctoral students to share ongoing developments in their research and practice drawing from fieldwork as well as attended conferences and meetings.

H 622. GLOBAL HEALTH SYSTEMS, POLICY AND POLITICS. (3 Credits)
Focuses on learning to identify key stakeholders in the politics of global health, and to be able to describe political and policy processes involved in negotiating global health decisions. Employment of theories and evidence from both the global North and South to explain political processes affecting public health practice and programs.

H 626. GLOBAL HEALTH SYSTEM FINANCE AND STRENGTHENING. (3 Credits)
Introduces an analytical framework of health system finance strengthening for global health, from local community to national level and international level. Develops the analytical skill and knowledge for examining the source and mechanism of financing health systems and identify, mobilize, organize, and manage domestic and global health resources. Provides training to examine equity and efficiency of financial burden in a health system, and the strategies to strengthen it.

H 630. QUANTITATIVE HEALTH POLICY RESEARCH METHODS I. (4 Credits)
Contemporary doctoral-level quantitative health policy/services research methods emphasizing linear regression models, data sources for health policy research, and health policy research literature.
Prerequisites: H 524 with B- or better

H 632. APPLIED HEALTH ECONOMICS. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing causal inference when potential endogeneity is present.
Prerequisites: H 630 with B- or better

H 635. COST EFFECTIVENESS ANALYSIS IN HEALTH AND MEDICAL CARE. (3 Credits)
The primary objective of this course is to introduce students to cost-effectiveness studies in health and medical care. Covers the core concepts of CEA, quality adjusted life years, cost calculations, and decision rules.

H 638. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, their finance mechanisms, and theoretical foundation behind the selection of certain system of health insurance and finance method.
Prerequisites: H 533 with C or better

H 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotion.
Recommended: 9 credits of public health or HDFS graduate coursework

H 642. ENVIRONMENTAL AND REGULATORY RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern risk analysis and how they are utilized to make evidence-based decisions in public health. Focus will be on real world examples of risk assessment by environmental and occupational regulatory agencies.

H 650. REPORTING RESULTS: WRITING FOR EPIDEMIOLOGY. (3 Credits)
Applied experience writing a scientific paper to disseminate results, including deciding on authorship, preparing a lay summary, revising and responding to peer review, and serving as a reviewer.
Prerequisites: H 526 with B- or better and H 551 [B-] and H 580 [B-]

H 651. ADVANCED EPIDEMIOLOGICAL METHODS. (4 Credits)
Covers advanced topics in epidemiology. Course expands on many of the same topics as H 526, explore them in greater breadth and depth. Topics include causal theory, measures of disease and association, confounding, selection bias, predictive models, directed acyclic graphs, effect modification, mediation, indirect and direct effects, study design, and other contemporary topics.
Prerequisites: H 526 with B- or better and H 581 [B-]

H 652. CAUSAL INFERENCE IN EPIDEMIOLOGY. (3 Credits)
Discussion of the theoretical framework of causal statistics and the development of modern methods including propensity scores and marginal structural models. Focus is on the inverse probability of treatment weighting; discussion of other estimation methods will be included. Additional topics may include longitudinal causal models, causal mediation, instrumental variables, and other contemporary topics. Applied examples will be used for illustration.
Prerequisites: H 651 with B- or better

H 659. QUANTITATIVE HEALTH POLICY RESEARCH METHODS II. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing health care utilization, expenditures, and outcomes data.
Prerequisites: H 630 with B- or better

H 662. ADVANCED METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Covers advanced methods and principles for infectious disease research, including framing infectious disease issues into testable hypotheses, designing epidemiologic studies using appropriate sampling strategies, and identifying strengths and weaknesses of various epidemiologic research methods.
Prerequisites: H 526 with B- or better and H 562 [B-]

H 671. ADVANCED THEORIES OF HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of major theories of health behavior (both health compromising and health enhancing).
Recommended: H 571

H 672. ADVANCED QUALITATIVE METHODS IN HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of the use of qualitative methods in health behavior research and practice.
Recommended: H 515 and SOC 518 and HDFS 538
H 673. MEASUREMENT OF HEALTH BEHAVIOR CONCEPTS. (4 Credits)
Provides in-depth study and field work for graduate students in public health and related fields of the methods used in the conceptualization, development, and evaluation of quantitative measures of health behavior and related concepts.
Recommended: H 524, H 515, and 3 credits in other quantitative research methods or social behavioral methods (eg. sociology or psychology or health promotion or education programs)

H 675. DEVELOPMENT OF HEALTH BEHAVIOR INTERVENTIONS. (3 Credits)
Examines the application of social/behavioral theories in health promotion interventions and in conducting intervention research in diverse populations. The course will focus on program development, on implementation strategies, and on translation into practice.
Recommended: H 571 and H 575 and H 576

H 676. ADVANCED TOPICS IN HEALTH PROMOTION AND HEALTH BEHAVIOR. (3 Credits)
Examines topics of relevance to health promotion and health behavior. Specific topics include current issues and emerging research findings, with a focus on social and behavior science perspectives, analysis of public health problems, and application of principles and practices of health promotion and health behavior.
This course is repeatable for 6 credits.
Recommended: H 515 and H 571

H 681. ADVANCED TOPICS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY. (3 Credits)
Advanced topics in the environment, safety and health discipline. Content varies with each offering.

H 682. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY: MOVING FROM RESEARCH TO PRACTICE. (3 Credits)
An examination of research transfer models that can be adapted and implemented to environmental and occupational settings. Case studies and content will vary with each course offering.

H 683. ADVANCED RESEARCH METHODS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH. (3 Credits)
Covers advanced methods for environmental and occupational health research, including framing environmental and occupational health issues into testable hypotheses, designing appropriate studies, and identifying strengths and weaknesses of different research methods.

H 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging of African-American, Latino, and Asian-Pacific Islander elderly. Taught spring term even years. Crosslisted as H 685/HDFS 685.
Equivalent to: HDFS 685
Recommended: 9 credits of public health or HDFS graduate coursework

H 699. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

Adapted Physical Education Graduate Major (MAPE)
The Master of Adapted Physical Education is a professional preparation program grounded in applied experiences and proficiency. Oregon State University provides a unique approach to training physical educators/adapted physical educators with a specific emphasis on the health and wellbeing of all students through the promotion of physical activity.

Major Code: 3010

Non-Thesis (Professional)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
<td>3</td>
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<tr>
<td>H 523</td>
<td>FOUNDATIONS OF PUBLIC HEALTH</td>
<td>4</td>
</tr>
<tr>
<td>KIN 506</td>
<td>PROJECTS (Elementary School Internship (with APE community program component))</td>
<td>6</td>
</tr>
<tr>
<td>KIN 510</td>
<td>INTERNSHIP (Middle School Internship (with APE community program component))</td>
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<tr>
<td>KIN 510</td>
<td>INTERNSHIP (School Internship – choice level (with APE community program component))</td>
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</tr>
<tr>
<td>KIN 512</td>
<td>APPLIED MOTOR LEARNING</td>
<td>3</td>
</tr>
<tr>
<td>KIN 547</td>
<td>INCLUSION IN PHYSICAL ACTIVITY</td>
<td>3</td>
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<td>KIN 548</td>
<td>ASSESSMENT AND PROGRAMMING FOR SPECIAL POPULATIONS</td>
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<td>KIN 549</td>
<td>PHYSICAL ACTIVITY FOR PERSONS WITH SEVERE DISABILITIES</td>
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<tr>
<td>KIN 551</td>
<td>CURRENT TRENDS AND ISSUES IN PHYSICAL EDUCATION</td>
<td>4</td>
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<tr>
<td>KIN 553</td>
<td>INSTRUCTIONAL ANALYSIS TECHNIQUES I</td>
<td>3</td>
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<tr>
<td>KIN 554</td>
<td>INSTRUCTIONAL ANALYSIS TECHNIQUES II</td>
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<tr>
<td>KIN 555</td>
<td>SKILL ANALYSIS AND ASSESSMENT IN K-12</td>
<td>3</td>
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<tr>
<td>KIN 556</td>
<td>INSTRUCTIONAL SKILLS I</td>
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<td>KIN 559</td>
<td>THE PHYSICAL EDUCATOR AS A PROFESSIONAL</td>
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<tr>
<td>KIN 564</td>
<td>PROGRAM CAPSTONE AND SYNTHESIS</td>
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Total Hours: 65

Major Code: 3010

The MAPE program starts in summer term.

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<td>KIN 510</td>
<td>INTERNSHIP</td>
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<td>KIN 547</td>
<td>INCLUSION IN PHYSICAL ACTIVITY</td>
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<td>KIN 553</td>
<td>INSTRUCTIONAL ANALYSIS TECHNIQUES I</td>
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<tr>
<td>Summer</td>
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<td>KIN 549</td>
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<tr>
<td>KIN 551</td>
<td>CURRENT TRENDS AND ISSUES IN PHYSICAL EDUCATION</td>
<td>4</td>
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<td>KIN 555</td>
<td>SKILL ANALYSIS AND ASSESSMENT IN K-12</td>
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<td>Winter</td>
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<td>ED 572</td>
<td>FOUNDATIONS OF ESOL EDUCATION</td>
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<td>KIN 506</td>
<td>PROJECTS</td>
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<td>KIN 548</td>
<td>ASSESSMENT AND PROGRAMMING FOR SPECIAL POPULATIONS</td>
<td>3</td>
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<tr>
<td>KIN 554</td>
<td>INSTRUCTIONAL ANALYSIS TECHNIQUES II</td>
<td>3</td>
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<tr>
<td>KIN 559</td>
<td>THE PHYSICAL EDUCATOR AS A PROFESSIONAL</td>
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Athletic Training Graduate Major (MATRN)

The Athletic Training graduate major is a two-year program leading to the Master of Athletic Training degree, MATRN.

Upon graduation, students are eligible to sit for the Board of Certification examination. Successful completion of this examination is the prerequisite to obtaining registration as an Athletic Trainer in the state of Oregon.

The clinical education of students in the athletic training program primarily takes place during rotations with various OSU intercollegiate athletic teams, some of the most culturally diverse groups on the OSU campus. This experience helps students develop sensitivity to varying cultures, strategies for overcoming potential cultural barriers to communication, and interpersonal skills that serve them well outside the campus community.

Major Code: 2440

<table>
<thead>
<tr>
<th>Code</th>
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<td>KIN 510</td>
<td>INTERNSHIP</td>
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<td>KIN 511</td>
<td>INTRODUCTION TO ATHLETIC TRAINING</td>
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<tr>
<td>KIN 520</td>
<td>ORTHOPEDIC ASSESSMENT OF UPPER EXTREMITY INJURIES</td>
<td>4</td>
</tr>
<tr>
<td>KIN 521</td>
<td>ORTHOPEDIC ASSESSMENT OF LOWER EXTREMITY INJURIES</td>
<td>4</td>
</tr>
<tr>
<td>KIN 522</td>
<td>ORTHOPEDIC ASSESSMENT OF SPINE</td>
<td>4</td>
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<tr>
<td>KIN 561</td>
<td>PSYCHOSOCIAL FACTORS IN PHYSICAL ACTIVITY</td>
<td>3</td>
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<tr>
<td>KIN 565</td>
<td>EMERGENCY MANAGEMENT OF SPORTS TRAUMA</td>
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<tr>
<td>KIN 566</td>
<td>GENERAL MEDICAL ASSESSMENT</td>
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<td>KIN 568</td>
<td>ATHLETIC TRAINING PROGRAM MANAGEMENT</td>
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<td>KIN 569</td>
<td>EVIDENCE-BASED PRACTICE</td>
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<td>KIN 584</td>
<td>PHYSIOLOGY AND MANAGEMENT OF MUSCULOSKELETAL INJURIES</td>
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<td>KIN 585</td>
<td>UPPER EXTREMITY THERAPEUTIC EXERCISE</td>
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<td>H 523</td>
<td>FOUNDATIONS OF PUBLIC HEALTH</td>
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<tr>
<td>NUTR 535</td>
<td>NUTRITION AND EXERCISE: MACRONUTRIENTS AND ENERGY METABOLISM</td>
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</table>

Total Hours: 95

Provides undergraduate students with academic and professional experience that will enable them to understand the impact of environmental and occupational hazards on human health and society, as well as developing effective interventions that will control and prevent exposure to hazards. This knowledge will enable them to apply scientific principles and management strategies in the fields of environmental protection, occupational health and safety, and public health.

Minor Code: 747

<table>
<thead>
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<th>Code</th>
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<tr>
<td>H 344</td>
<td>*FOUNDATIONS OF ENVIRONMENTAL HEALTH</td>
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<tr>
<td>H 407</td>
<td>SEMINAR</td>
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<tr>
<td>H 410</td>
<td>INTERNSHIP</td>
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<tr>
<td>H 445</td>
<td>*OCURRENDUAL HEALTH</td>
<td>3</td>
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<tr>
<td>H 448</td>
<td>PUBLIC HEALTH TOXICOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>H 480</td>
<td>UNDERGRADUATE EOH SEMINAR</td>
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</tbody>
</table>

Electives

Select two courses from the following:
- AEC 432 ENVIRONMENTAL LAW
- AG 412 AG SAFETY AND HEALTH
- FST 421 *FOOD LAW
- GEO 309 *ENVIRONMENTAL JUSTICE
- GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
- H 385 SAFETY AND HEALTH STANDARDS AND LAWS
- H 388 *GLOBAL ENVIRONMENTAL HEALTH
- H 489 EMERGENCY AND DISASTER MANAGEMENT
- H 494 APPLIED ERGONOMICS

Total Hours: 27

* Baccalaureate Core Course (BCC)

Epidemiology Graduate Minor

The Epidemiology graduate minor is intended for doctoral students who seek additional formal training and mentoring in epidemiology.

Minor Code: 7588

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>H 525</td>
<td>EPIDEMIOLOGICAL METHODS I</td>
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<tr>
<td>H 526</td>
<td>EPIDEMIOLOGICAL METHODS II</td>
<td>3</td>
</tr>
<tr>
<td>H 580</td>
<td>LINEAR REGRESSION AND ANALYSIS OF TIME TO EVENT DATA (H 524 or equivalent is a prerequisite)</td>
<td>4</td>
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<tr>
<td>H 581</td>
<td>GENERALIZED LINEAR MODELS AND CATEGORICAL DATA ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>H 651</td>
<td>ADVANCED EPIDEMIOLOGICAL METHODS</td>
<td>4</td>
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</tbody>
</table>

Select at least two electives from the following:
- H 537 INJURY EPIDEMIOLOGY
- H 544 ENVIRONMENTAL AND OCCUPATIONAL EPIDEMIOLOGY
- H 551 APPLIED EPIDEMIOLOGICAL ANALYSIS OF SECONDARY DATA
- H 552 DISASTER EPIDEMIOLOGY
- H 554 EPIDEMIOLOGY OF AGING
- H 555 CANCER EPIDEMIOLOGY
- H 560 PUBLIC HEALTH SURVEILLANCE
- H 562 INFECTIOUS DISEASE EPIDEMIOLOGY
- H 563 PHYSICAL ACTIVITY EPIDEMIOLOGY
- H 578 INTRODUCTION TO MOLECULAR EPIDEMIOLOGY I
- H 592 SPATIAL EPIDEMIOLOGY

Total Hours: 95

Major Code: 2440

Environmental and Occupational Health Minor

Also available via Ecampus.
Ergonomics Graduate Minor

The Graduate Minor in Ergonomics is for masters and doctoral level students who seek additional formal training and mentoring in Ergonomic practice. Students pursuing a Minor in Ergonomics must include at least one Environmental and Occupational Health faculty member on their committee. This faculty member must be engaged in the development of the student’s Program of Study and in the case of Doctoral students, their dissertation research; therefore, it is recommended that this faculty member be identified early in the doctoral program.

Minor Code: 7715

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<tr>
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<tbody>
<tr>
<td>H 512</td>
<td>INTRODUCTION TO ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES</td>
<td>3</td>
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<tr>
<td>H 546</td>
<td>PHYSICAL AGENTS AND HUMAN HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>H 590</td>
<td>OCCUPATIONAL ERGONOMICS AND BIOMECHANICS</td>
<td>3</td>
</tr>
<tr>
<td>H 594</td>
<td>APPLIED ERGONOMICS</td>
<td>3</td>
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</tbody>
</table>

Select at least one additional course (3 credits for Masters) or two additional courses (6 credits for Doctoral) from the following: ¹

- CCE 526 DESIGN FOR SAFETY
- H 537 INJURY EPIDEMIOLOGY
- H 588 APPLIED OCCUPATIONAL SAFETY AND HEALTH
- IE 545 HUMAN FACTORS ENGINEERING
- KIN 523 BIOMECHANICS OF MOTOR ACTIVITIES
- KIN 525 BIOMECHANICS OF MUSCULOSKELETAL INJURY

Total Hours: 15-18

¹ Other courses, as approved by Minor Professor, from the Human Centered Design (http://hcd.oregonstate.edu/) Courses at OSU or other courses as approved by Minor Professor

Kinesiology Graduate Major (MS, PhD)

Graduate Areas of Concentration

Biophysical kinesiology, psychosocial kinesiology

The graduate program in kinesiology offers courses and learning experiences in the theoretical and practical study of physical activity (including exercise and sport) for the promotion of optimal health and disease prevention.

Graduate fields in kinesiology include biophysical kinesiology and psychosocial kinesiology.

The MS degree can be completed via a thesis or project. The PhD degree requires the completion of a dissertation. For further information about the graduate program in Kinesiology, visit the school’s website (http://health.oregonstate.edu/bphs/).

Major Code: 7700

Major Code: 7700
Adapted Physical Activity Graduate Option

This option is offered within the following major(s):

- Kinesiology - College of Public Health and Human Sciences (p. 903)

This graduate option is focused on the development of leadership personnel in the area of disability and will build competencies to serve individuals with disabilities as effective teachers, scholars, and advocates.

Option Code: 7720

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>Prerequisite Course</td>
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<tr>
<td>KIN 544</td>
<td>ADVANCED ADAPTED PHYSICAL ACTIVITY (or equivalent courses)</td>
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Required

Select a minimum of 9 credits of the following:

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<td>INCLUSION IN PHYSICAL ACTIVITY</td>
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<tr>
<td>KIN 548</td>
<td>ASSESSMENT AND PROGRAMMING FOR SPECIAL POPULATIONS</td>
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<tr>
<td>KIN 549</td>
<td>PHYSICAL ACTIVITY FOR PERSONS WITH SEVERE DISABILITIES</td>
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<tr>
<td>KIN 550</td>
<td>HEALTH PROMOTION FOR PEOPLE WITH DISABILITIES</td>
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<tr>
<td>KIN 647</td>
<td>CURRENT TOPICS AND RESEARCH IN ADAPTED PHYSICAL ACTIVITY</td>
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<tr>
<td>KIN 610</td>
<td>PROFESSIONAL INTERNSHIP PHYSICAL EDUCATION</td>
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Note: This requires graduate students to be in residence for 1 year.

Total Hours 12

The major faculty advisor(s) and a faculty member from the Adapted Physical Activity program must approve the option in Adapted Physical Activity.

Option Code: 7720

Kinesiology Graduate Minor

For more information, see the school advisor.

Minor Code: 7710

Kinesiology Undergraduate Major (BS, HBS)

Also available at OSU-Cascades.

The Kinesiology major prepares students for careers in physical activity and fitness/wellness such as organizing, directing or managing physical fitness programs; personal trainer; fitness instructor; exercise physiologist; strength and fitness coach; and fitness entrepreneur. The degree can also serve as preparation for applications to a master's level physical education teacher education program, medical school, a professional program in the allied health professions (e.g., physical or occupational therapy, nursing, physician assistant) or other graduate education. Students interested in entry into professional schools of physical or occupational therapy, nursing, medical school, or physicians assistant should take the Pre-Therapy and Allied Health option of the Kinesiology major, which has entry standards that must be met after completion of 90 credits.

Major Code: 840

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<td>Kinesiology Core (29 credits)</td>
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<td>KIN 131</td>
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<td>KIN 206</td>
<td>PROJECTS</td>
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<td>KIN 311</td>
<td>MOTOR BEHAVIOR</td>
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<td>KIN 312</td>
<td>SOCIOCULTURAL DIMENSIONS OF PHYSICAL ACTIVITY</td>
<td>3</td>
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<td>KIN 321</td>
<td>BIOMECHANICS OF HUMAN MOVEMENT</td>
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<td>KIN 324</td>
<td>EXERCISE PHYSIOLOGY</td>
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<td>KIN 370</td>
<td>PSYCHOLOGY OF SPORT AND PHYSICAL ACTIVITY</td>
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<td>KIN 481</td>
<td>ANALYSIS OF CRITICAL ISSUES IN KINESIOLOGY</td>
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Required Supporting Courses (41 credits)

Select one of the following options:

Option A

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<td>BI 231</td>
<td>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
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<td>&amp; BI 232 &amp; BI 233</td>
<td>and INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
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<td>&amp; BI 233</td>
<td>and INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
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<td>BI 241</td>
<td>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
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<tr>
<td>&amp; BI 242 &amp; BI 243</td>
<td>and INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
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<tr>
<td>&amp; BI 243</td>
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Option B

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<tr>
<td>BI 331</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<td>&amp; BI 333</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>BI 341</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td>&amp; BI 342 &amp; BI 343</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
<td>3</td>
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<tr>
<td>&amp; BI 343</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
<td>3</td>
</tr>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>or CH 231 &amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>CH 122</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>or CH 232 &amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>CH 123</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>or CH 233 &amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
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<tr>
<td>H 100</td>
<td>INTRODUCTION TO PUBLIC HEALTH</td>
<td>4</td>
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<tr>
<td>MTH 112</td>
<td>ELEMENTARY FUNCTIONS</td>
<td>4</td>
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<tr>
<td>NUTR 240</td>
<td>HUMAN NUTRITION</td>
<td>3</td>
</tr>
</tbody>
</table>

KIN Courses Beyond the Core (minimum 24 credits)^

Total credits required for graduation is 180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

The major faculty advisor(s) and a faculty member from the Adapted Physical Activity program must approve the option in Adapted Physical Activity.
These KIN courses are chosen to meet individual students’ educational goals in preparation for their chosen careers. Must take at least 24 total credits of 300- and 400-level KIN courses not included in the Kinesiology Core, and among these credits:
1. Must take at least 3 KIN Lab courses (KIN course with a lab component; credits per course may vary)
2. Must take at least 3 credits of Experiential Learning from the following courses: KIN 301, KIN 306, KIN 401, KIN 406, KIN 410, and KIN practicum courses; or credits earned in research, study abroad, or service-learning experiences. No more than 9 Experiential Learning credits will count toward the 24 total credits required.

### Minimum Grade Policy

A grade of C− or better is required in all courses fulfilling Kinesiology major requirements (Kinesiology Core, Required Supporting Courses, and KIN Courses Beyond the Core).

### Repeated Courses Policy

The university’s repeated courses policy will be followed (AR 20). Kinesiology students are allowed at most two attempts to meet individual course degree requirements. Students who do not receive the minimum grade required for a course after two attempts (including courses transferred from other institutions) will not be allowed to have grades earned in subsequent attempts count toward meeting Kinesiology degree requirements. As a result, such students may not be able to complete a degree and/or an option in Kinesiology.

Pre-Therapy and Allied Health is an option with admission standards that may be added to the major. Students may apply for admission to the PTAH option after completion of 90 credits. Requirements for admission can be found under the catalog listing for the PTAH option.

**Major Code:** 840

### Pre-Therapy and Allied Health Option

This option is offered within the following major(s):

- Kinesiology - College of Public Health and Human Sciences (p. 904)

This program is designed for students interested in pursuing admission to medical school or a professional program in the allied health professions, such as athletic training, nursing, occupational therapy, physical therapy, or physician assistant.

The Pre-Therapy and Allied Health option requires the completion of one of six professional tracks:

1. Pre-Athletic Training
2. Pre-Medicine
3. Pre-Nursing
4. Pre-Occupational Therapy
5. Pre-Physical Therapy
6. Pre-Physician Assistant

**Option Code:** 732

Pre-Therapy and Allied Health is an undergraduate option that may be added to the Kinesiology major once the following admission standards have been met. Students may apply for admission to the PTAH option after completion of 90 credits. Requirements for admission include:

- Cumulative GPA of 3.0 and,
- A grade of ‘C’ or better and average GPA of 2.7 or higher in one of the anatomy and physiology series:
- BI 231–BI 233 and BI 241–BI 243
- BI 331–BI 333 and BI 341–BI 343
- Z 331-Z 333 and Z 341-Z 343 (these courses have terminated but will still be accepted if they were taken)

### Code Title Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIN 132</td>
<td>INTRODUCTION TO THE ALLIED HEALTH PROFESSIONS (Pre-Med students should take BI 109)</td>
<td>28-33</td>
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</table>

**Select four of the following KIN supporting courses:**

1. KIN 394 PROFESSIONAL ACTIVITIES: RESISTANCE TRAINING PROGRAM DESIGN
2. KIN 395 PROFESSIONAL ACTIVITIES: GROUP FITNESS
3. KIN 396 PROFESSIONAL ACTIVITIES: AQUATICS
4. KIN 423 QUALITATIVE MOVEMENT ANALYSIS
5. KIN 425 ANATOMICAL KINESIOLOGY (Required for Pre-Athletic Training)
6. KIN 434 APPLIED MUSCLE PHYSIOLOGY
7. KIN 437 PHYSICAL ACTIVITY, AGING, AND CHRONIC DISEASE
8. KIN 444 ADVANCED ADAPTED PHYSICAL ACTIVITY
9. KIN 483 TISSUE INJURY AND REPAIR (Required for Pre-Athletic Training)

**Select one of the following tracks:**

<table>
<thead>
<tr>
<th>Track</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Pre-Medicine Track (55 credits)</td>
<td>26-55</td>
</tr>
<tr>
<td>Pre-Athletic Training Track (37 credits)</td>
<td></td>
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</tbody>
</table>

### Pre-Medicine Track (55 credits)

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
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<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
</tr>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>&amp; BI 212</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>&amp; BI 213</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
</tr>
<tr>
<td>&amp; CH 332</td>
<td>and ORGANIC CHEMISTRY</td>
</tr>
<tr>
<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
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<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
</tr>
<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
</tr>
<tr>
<td>&amp; PH 202</td>
<td>and *GENERAL PHYSICS</td>
</tr>
<tr>
<td>&amp; PH 203</td>
<td>and *GENERAL PHYSICS</td>
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</table>

**Pre-Athletic Training Track (37 credits)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>BI 103</td>
<td>*HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE</td>
</tr>
<tr>
<td>COMM 326</td>
<td>INTERCULTURAL COMMUNICATION</td>
</tr>
<tr>
<td>H 225</td>
<td>*SPECIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
</tr>
<tr>
<td>KIN 360</td>
<td>INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE</td>
</tr>
<tr>
<td>KIN 341/NUTR 341</td>
<td>NUTRITION FOR EXERCISE</td>
</tr>
<tr>
<td>KIN 344</td>
<td>PRE-PTERAPY/ALLIED HEALTH PRACTICUM</td>
</tr>
<tr>
<td>KIN 360</td>
<td>THERAPEUTIC MODALITIES</td>
</tr>
<tr>
<td>KIN 385</td>
<td>THERAPEUTIC EXERCISE</td>
</tr>
<tr>
<td>KIN 425</td>
<td>ANATOMICAL KINESIOLOGY</td>
</tr>
<tr>
<td>KIN 483</td>
<td>TISSUE INJURY AND REPAIR</td>
</tr>
<tr>
<td>PHL 444/REL 444</td>
<td>*BIOMEDICAL ETHICS</td>
</tr>
</tbody>
</table>

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Nutrition Graduate Major (MS, PhD)

Graduate Areas of Concentration

Nutrition

Also available via Ecampus.

The School of Biological and Population Health Sciences offers graduate programs leading to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees in nutrition. The program of study integrates multiple disciplines relevant to nutrition, including molecular, biochemical, physiological and clinical nutrition. The overall goal of the program is...
for the student to gain a 'cutting-edge' understanding of contemporary issues in nutrition and apply these concepts to human health.

Research in nutrition is focused on human nutrition and nutrient effects on physiological systems impacting human health. Our research programs seek the discovery of new knowledge, information, techniques and/or interventions that can promote the optimal health of individuals and families in Oregon, nationally, and worldwide. Either thesis or non-thesis based original research is required for the MS degree. Successful defense of scholarly research in a doctoral dissertation must be completed as part of the requirements for the PhD degree.

Since nutrition builds upon the natural sciences, entering graduate students should have a strong background in chemistry, physiology, nutrition, statistics, and biochemistry.

Depending upon their concentration, graduates are prepared for positions in academic research and teaching or research and development in industry or government or practice in dietetics.

Information on the nutrition graduate program graduate fellowships and assistantships is available at the website (http://health.oregonstate.edu/degrees/graduate/nutrition/). Click on the 'Application and Admission Requirements' link.

For additional information about the college and school, visit the website (http://health.oregonstate.edu/).

**Major Code:** 4660

**MS**

Thesis track requires a minimum of 45 credits, including 6 thesis credits; courses are selected in consultation with their Nutrition Faculty Advisor.

Non-thesis track requires a minimum of 45 credits, including 6 credits for a capstone project; course are selected in consultation with their Nutrition Faculty Advisor.

**PhD**

A minimum of 108 credits. Courses selected in consultation with their Nutrition Faculty Advisor.

**Major Code:** 4660

**Nutrition Graduate Minor**

For more details, see the school advisor.

**Minor Code:** 4660

**Nutrition Minor**

**Minor Code:** 426

This minor requires 35 credits, including 22 credits at the upper-division level.

Students are strongly encouraged to consult an advisor in the School of Biological and Population Health Sciences to be sure that prerequisites are taken.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 350</td>
<td>ELEMENTARY BIOCHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>BI 221 &amp; BI 232</td>
<td>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY and INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
<tr>
<td>NUTR 240</td>
<td>HUMAN NUTRITION</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 241</td>
<td>APPLICATIONS IN HUMAN NUTRITION</td>
<td>1</td>
</tr>
<tr>
<td>NUTR 312</td>
<td>*ISSUES IN NUTRITION AND HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 325</td>
<td>NUTRITION THROUGH THE LIFE CYCLE</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 417</td>
<td>HUMAN NUTRITION SCIENCE</td>
<td>4</td>
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<tr>
<td>NUTR 418</td>
<td>HUMAN NUTRITION SCIENCE</td>
<td>4</td>
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<tr>
<td>NUTR 423</td>
<td>COMMUNITY NUTRITION</td>
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</table>

Total Hours 35

* Baccalaureate Core Course (BCC)

**Minor Code:** 426

**Nutrition Undergraduate Major (BS, HBS)**

**Major Code:** 466

**Pre-Nutrition Major Code:** 463

<table>
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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>Baccalaureate Core</td>
<td>Select 48 credits</td>
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<tr>
<td>Nutrition Options (Required)</td>
<td>Select one of the following options:</td>
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<tr>
<td>Pre-Dietetics</td>
<td>Dietetics (must first complete Pre-Dietetics)</td>
<td></td>
</tr>
<tr>
<td>Nutrition and Foodservice Systems</td>
<td>Nutrition and Foodservice Systems</td>
<td></td>
</tr>
<tr>
<td>Nutrition and Health Sciences</td>
<td>Nutrition and Health Sciences</td>
<td></td>
</tr>
</tbody>
</table>

Total credits required for graduation 180

**Major Code:** 466

**Pre-Nutrition Major Code:** 463

**Dietetics Option**

This option is offered within the following major(s):

- Nutrition - College of Public Health and Human Sciences (p. 907)

Dietitians provide guidance to the public regarding nutrition, diet and their relationship to disease. The Dietetics option at OSU is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics and prepares students to become Registered Dietitians (RD). This option provides the course work and preparation to enter a supervised dietetic internship, pass the Registered Dietitian Exam and become a leader in the profession. Graduates from OSU's program consistently exceed the national average for placement into accredited dietetic internships and for passing the RD Exam the first time.

Before taking the Dietetics option, students must first complete the Pre-Dietetics option.
Students must apply to and be accepted into the Dietetics option in Nutrition. See Pre-Dietetics courses and Dietetics Admission Requirements.

**Option Code: 419**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
<td>4</td>
</tr>
<tr>
<td>BB 350</td>
<td>ELEMENTARY BIOCHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>BI 231 &amp; BI 232</td>
<td>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
<tr>
<td>BI 241 &amp; BI 242</td>
<td>INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
<td>6</td>
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<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
<td>4-6</td>
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<tr>
<td>or CH 335</td>
<td>ORGANIC CHEMISTRY</td>
<td></td>
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<tr>
<td>or CH 336</td>
<td>ORGANIC CHEMISTRY</td>
<td></td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
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<tr>
<td>or COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
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<tr>
<td>H 100</td>
<td>INTRODUCTION TO PUBLIC HEALTH</td>
<td>4</td>
</tr>
<tr>
<td>H 320</td>
<td>INTRODUCTION TO HUMAN DISEASE</td>
<td>3</td>
</tr>
<tr>
<td>KIN 324</td>
<td>EXERCISE PHYSIOLOGY</td>
<td>4</td>
</tr>
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<td>NUTR 235</td>
<td>SCIENCE OF FOODS</td>
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<td>NUTR 307</td>
<td>SEMINAR</td>
<td>1</td>
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<tr>
<td>NUTR 311</td>
<td>FOODSERVICE PRODUCTION AND PURCHASING</td>
<td>4</td>
</tr>
<tr>
<td>NUTR 319</td>
<td>PROMOTING FOOD AND NUTRITION</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 325</td>
<td>NUTRITION THROUGH THE LIFE CYCLE</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 407</td>
<td>SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>NUTR 417 &amp; NUTR 418</td>
<td>HUMAN NUTRITION SCIENCE &amp; HUMAN NUTRITION SCIENCE</td>
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<tr>
<td>NUTR 423</td>
<td>COMMUNITY NUTRITION</td>
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</tr>
<tr>
<td>NUTR 430</td>
<td>MEDICAL NUTRITION THERAPY I</td>
<td>4</td>
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<tr>
<td>NUTR 431</td>
<td>MEDICAL NUTRITION THERAPY 2</td>
<td>4</td>
</tr>
<tr>
<td>NUTR 432</td>
<td>MEDICAL NUTRITION THERAPY 3</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 439</td>
<td>*COMMUNICATIONS IN DIETETICS</td>
<td>3</td>
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<tr>
<td>NUTR 446</td>
<td>MANAGING FOOD AND NUTRITION SERVICES</td>
<td>4</td>
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<tr>
<td>NUTR 447</td>
<td>MANAGEMENT OF FOOD SYSTEMS LABORATORY</td>
<td>3</td>
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<tr>
<td>PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Electives**

Sufficient (together with baccalaureate and nutrition and food management cores) to ensure 180 total credits (60 must be upper division).

Total Hours: 98-100

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)

**Option Code: 261**

**Introductory Core**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>H 100</td>
<td>INTRODUCTION TO PUBLIC HEALTH</td>
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</tr>
<tr>
<td>NUTR 104</td>
<td>ORIENTATION TO THE NUTRITION MAJOR</td>
<td>1</td>
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<tr>
<td>CA 201</td>
<td>CULINARY ARTS CAREER TRAINING at LBCC</td>
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<td>NUTR 240</td>
<td>HUMAN NUTRITION</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 241</td>
<td>APPLICATIONS IN HUMAN NUTRITION</td>
<td>1</td>
</tr>
<tr>
<td>NUTR 325</td>
<td>NUTRITION THROUGH THE LIFE CYCLE</td>
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<td>CA 101</td>
<td>CULINARY ARTS PRACTICUM I at LBCC</td>
<td>7</td>
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<td>CA 102</td>
<td>CULINARY ARTS PRACTICUM II at LBCC</td>
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<td>CA 103</td>
<td>CULINARY ARTS PRACTICUM III at LBCC</td>
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**General Education Core**

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<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td>3</td>
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<td>or COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
<td>4</td>
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<tr>
<td>H 320</td>
<td>INTRODUCTION TO HUMAN DISEASE</td>
<td>3</td>
</tr>
<tr>
<td>H 385</td>
<td>SAFETY AND HEALTH STANDARDS AND LAWS</td>
<td>3</td>
</tr>
<tr>
<td>or H 344</td>
<td>*FOUNDATIONS OF ENVIRONMENTAL HEALTH</td>
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<tr>
<td>MB 230</td>
<td>*INTRODUCTORY MICROBIOLOGY</td>
<td>4-5</td>
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<td>or MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
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</tr>
<tr>
<td>&amp; MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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</tr>
<tr>
<td>or ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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**Healthy Foodservice Systems Courses**

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<thead>
<tr>
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<tbody>
<tr>
<td>BA 315</td>
<td>ACCOUNTING FOR DECISION MAKING</td>
<td>4</td>
</tr>
<tr>
<td>BA 330</td>
<td>LEGAL ENVIRONMENT OF BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
<td>4</td>
</tr>
<tr>
<td>BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 390</td>
<td>MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>CA 111</td>
<td>FOOD SERVICE SAFETY AND SANITATION at LBCC</td>
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<tr>
<td>CA 112</td>
<td>STATIONS, TOOLS, AND CULINARY TECHNIQUES at LBCC</td>
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<tr>
<td>FST 251</td>
<td>INTRODUCTION TO WINES, BEERS, AND SPIRITS</td>
<td>3</td>
</tr>
<tr>
<td>FST 350</td>
<td>FOOD SAFETY AND SANITATION</td>
<td>3</td>
</tr>
<tr>
<td>FST 421</td>
<td>*FOOD LAW</td>
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<tr>
<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
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</tr>
<tr>
<td>NUTR 311</td>
<td>FOODSERVICE PRODUCTION AND PURCHASING</td>
<td>4</td>
</tr>
<tr>
<td>NUTR 319</td>
<td>PROMOTING FOOD AND NUTRITION</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 407</td>
<td>SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>NUTR 410</td>
<td>FIELD EXPERIENCE ²</td>
<td>5</td>
</tr>
<tr>
<td>NUTR 416</td>
<td>*CULTURAL ASPECTS OF FOODS</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 446</td>
<td>MANAGING FOOD AND NUTRITION SERVICES</td>
<td>4</td>
</tr>
<tr>
<td>NUTR 447</td>
<td>MANAGEMENT OF FOOD SYSTEMS LABORATORY</td>
<td>3</td>
</tr>
</tbody>
</table>

Total credits required for graduation is 180

Upper division credits required is 60

**Nutrition and Foodservice Systems Option**

This option is offered within the following major(s):

- Nutrition - College of Public Health and Human Sciences (p. 907)

The Nutrition and Foodservice Systems option prepares graduates for professional careers directing foodservice operations that focus on serving healthy menu options and using local ingredients. Foodservice opportunities exist in both non-commercial operations including schools, universities, and healthcare as well as others in the retail environment; all are striving to meet the consumer demand for healthier food options.

This program integrates course work taken at OSU and the Culinary Arts program at Linn-Benton Community College.

Please contact Dr. Mary M. Cluskey, 541-737-0960, cluskeym@oregonstate.edu for more information about the Nutrition and Foodservice Systems option.
Maximum S/U credits is 36 (departmental courses within major may not be taken S/U)

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
+ Transfer students should refer to Academic Regulation 18a.1
1 Recommend fall term of senior year
2 Pre-arrange with department. Recommend spring term of senior year

Option Code: 261

Nutrition and Health Sciences Option

This option is offered within the following major(s):

- Nutrition - College of Public Health and Human Sciences (p. 907)

The Nutrition and Health Sciences option is designed for students who want to focus on the scientific basis of nutrition for careers in medicine and the health sciences or in nutrition science research. Tracks within the option allow students to specifically focus and prepare for careers in medicine and the allied health sciences or for academia and/or health-related research. Professionals trained in nutrition science have many career options due to the growth and aging of our population, the focus on prevention of obesity and other chronic diseases, and a growing emphasis on health, nutrition, and wellness.

Option Code: 467

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
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<tr>
<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>7</td>
</tr>
<tr>
<td>&amp; BB 451 &amp; GENERAL BIOCHEMISTRY</td>
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<tr>
<td>BI 211 &amp; BI 212 &amp; BI 213 &amp; *PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>&amp; BI 231 &amp; BI 232 &amp; BI 233 &amp; INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
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</tr>
<tr>
<td>&amp; BI 241 &amp; BI 242 &amp; BI 233 &amp; INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>&amp; NUTR 240 ORIENTATION TO THE NUTRITION MAJOR</td>
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<tr>
<td>&amp; NUTR 401 RESEARCH</td>
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<tr>
<td>Total Hours</td>
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</table>

NUTR 104 ORIENTATION TO THE NUTRITION MAJOR
NUTR 401 RESEARCH

Total credits must be sufficient (together with baccalaureate and NUTR cores) to ensure 180 total credits (60 credits must be upper division).

Option Code: 467

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
</tr>
<tr>
<td>COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
<td></td>
</tr>
<tr>
<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>H 100</td>
<td>INTRODUCTION TO PUBLIC HEALTH</td>
<td>4</td>
</tr>
<tr>
<td>KIN 324</td>
<td>EXERCISE PHYSIOLOGY</td>
<td>4</td>
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<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
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</tr>
<tr>
<td>&amp; MB 303 &amp; GENERAL MICROBIOLOGY LABORATORY</td>
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<tr>
<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
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<tr>
<td>PH 201 &amp; PH 202 &amp; *GENERAL PHYSICS</td>
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<tr>
<td>&amp; PSY 201 &amp; PSY 202 &amp; *GENERAL PSYCHOLOGY</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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</table>

NUTR 240 HUMAN NUTRITION
NUTR 241 APPLICATIONS IN HUMAN NUTRITION
NUTR 325 NUTRITION THROUGH THE LIFE CYCLE
NUTR 417 HUMAN NUTRITION SCIENCE
& NUTR 418 & HUMAN NUTRITION SCIENCE
NUTR 430 MEDICAL NUTRITION THERAPY 1
NUTR 439 *COMMUNICATIONS IN DIETETICS

Select two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUTR 312</td>
<td>*ISSUES IN NUTRITION AND HEALTH</td>
<td>3</td>
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<tr>
<td>NUTR 423</td>
<td>COMMUNITY NUTRITION</td>
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<tr>
<td>NUTR 431</td>
<td>MEDICAL NUTRITION THERAPY 2</td>
<td></td>
</tr>
<tr>
<td>NUTR 432</td>
<td>MEDICAL NUTRITION THERAPY 3</td>
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</table>

Tracks

Select one of the following tracks:

Nutrition Science Track

Physician Assistant and Pre-Med Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
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<tr>
<td>KIN 132</td>
<td>INTRODUCTION TO THE ALLIED HEALTH PROFESSIONS</td>
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<tr>
<td>or BI 109 &amp; HEALTH PROFESSIONS: MEDICAL</td>
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<tr>
<td>KIN 325</td>
<td>FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION</td>
<td>3</td>
</tr>
<tr>
<td>KIN 343</td>
<td>PRE-THERAPY/ALLIED HEALTH SEMINAR 1</td>
<td>1</td>
</tr>
<tr>
<td>or GS 410 &amp; SCIENCE INTERNSHIP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PH 203 &amp; *GENERAL PHYSICS</td>
<td>5</td>
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<tr>
<td>PHAR 210</td>
<td>TERMINOLOGY OF THE HEALTH SCIENCES</td>
<td>2</td>
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</tbody>
</table>

1 GS 410 requirement for Pre-Med or MCAT preparation.

Total credits must be sufficient (together with baccalaureate and NUTR cores) to ensure 180 total credits (60 credits must be upper division).

Option Code: 467
Pre-Dietetics Option

This option is offered within the following major(s):

- Nutrition - College of Public Health and Human Sciences (p. 907)

Dietetics Admission Requirements

To be considered for admission to the Dietetics option within the Nutrition major, students must complete the Pre-Dietetics courses listed below with a grade of B– or higher in each of the NUTR courses listed, a grade of C– or higher in each of the other courses listed, and a grade-point average of 3.0 or higher for the listed courses as a whole. Applicants to the Dietetics option must achieve an overall GPA of 3.0 or higher based on completing at least 60 quarter credits [OSU (institutional) and transfer], including the prerequisite courses listed below. At least 12 credits must be taken at OSU.

Information on how to apply for admission to the Dietetics option can be found at the PHHS Advising Office and on the BPHS Nutrition Dietetics Website (http://health.oregonstate.edu/bphs/dietetics/).

Option Code: 652

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
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</tbody>
</table>

Select one of the following options: 10-15

Option A

- CH 122  *GENERAL CHEMISTRY
- CH 123  and *GENERAL CHEMISTRY

Option B

- CH 231  GENERAL CHEMISTRY
- CH 232  and GENERAL CHEMISTRY
- CH 233  and GENERAL CHEMISTRY
- CH 261  *LABORATORY FOR CHEMISTRY 231
- CH 262  and *LABORATORY FOR CHEMISTRY 232
- CH 263  and *LABORATORY FOR CHEMISTRY 233

CH 331  ORGANIC CHEMISTRY
or CH 334  ORGANIC CHEMISTRY

MB 230  *INTRODUCTORY MICROBIOLOGY
or MB 302  GENERAL MICROBIOLOGY
& MB 303  and GENERAL MICROBIOLOGY LABORATORY

NUTR 104  ORIENTATION TO THE NUTRITION MAJOR

NUTR 240  HUMAN NUTRITION

NUTR 241  APPLICATIONS IN HUMAN NUTRITION

NUTR 325  NUTRITION THROUGH THE LIFE CYCLE

PSY 201  *GENERAL PSYCHOLOGY

WR 121  *ENGLISH COMPOSITION

Total Hours 40-47

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)

Option Code: 652

Physical Therapy Professional Major (DPT)

Available only at OSU-Cascades.

This program will be admitting students from Fall 2021 forward. Please contact Christine Pollard for more information.

The Doctor of Physical Therapy (DPT) degree program at OSU-Cascades will produce graduates who are skilled physical therapists to meet workforce demands and produce citizens who are ethically responsible and committed to social justice. The vision for the Physical Therapy profession is to transform society by optimizing movement to improve the human experience.

Physical therapists (PTs) are healthcare professionals who treat individuals of all ages, from newborns to the very oldest who have medical problems or other health-related conditions that limit their abilities to move and perform functional activities in their daily lives. In addition, PTs work with individuals and groups to prevent the loss of ability before it occurs by developing fitness-and-wellness-oriented programs and other population -health interventions for healthier and more active lifestyles. PTs provide care for people in a variety of settings including hospitals, private practices, outpatient clinics, home health agencies, schools, sports and fitness facilities, work settings, and nursing homes.

State licensure is required in each state in which a physical therapist practices. To practice as a physical therapist in the United States (US), a student must earn a DPT degree from an accredited physical therapist education program and pass a state licensure exam. The Commission on Accreditation in Physical Therapy Education (CAPTE) governs DPT accreditation in the US.

Major Code: 7721

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PT 700</td>
<td>PROFESSIONALISM AND INTERPROFESSIONAL PRACTICE</td>
<td>2</td>
</tr>
<tr>
<td>PT 701</td>
<td>(Cultural Competence in Physical Therapy)</td>
<td>2</td>
</tr>
<tr>
<td>PT 702</td>
<td>(Geriatrics in Physical Therapy)</td>
<td>2</td>
</tr>
<tr>
<td>PT 703</td>
<td>(Psychosocial Aspects of Disability)</td>
<td>2</td>
</tr>
<tr>
<td>PT 704</td>
<td>(Physical Therapy in Rural Communities)</td>
<td>2</td>
</tr>
<tr>
<td>PT 705</td>
<td>(Prevention, Wellness, and Population Health)</td>
<td>3</td>
</tr>
<tr>
<td>PT 710</td>
<td>(Musculoskeletal Anatomy)</td>
<td>6</td>
</tr>
<tr>
<td>PT 711</td>
<td>ANALYTICAL ANATOMY AND IMAGING</td>
<td>4</td>
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<tr>
<td>PT 712</td>
<td>NEUROANATOMY AND NEUROSCIENCE</td>
<td>5</td>
</tr>
<tr>
<td>PT 714</td>
<td>(Neuropathology)</td>
<td>4</td>
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<tr>
<td>PT 720</td>
<td>MOTOR DEVELOPMENT</td>
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<td>PT 721</td>
<td>MOTOR CONTROL AND LEARNING ACROSS THE LIFE SPAN</td>
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<td>PT 730</td>
<td>APPLIED PHYSIOLOGY</td>
<td>3</td>
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<tr>
<td>PT 731</td>
<td>CLINICAL EXERCISE PHYSIOLOGY</td>
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<tr>
<td>PT 735</td>
<td>(Principles of Disease)</td>
<td>3</td>
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<tr>
<td>PT 736</td>
<td>(General Medical Pathology)</td>
<td>6</td>
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<td>PT 740</td>
<td>THERAPEUTIC EXERCISE I</td>
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<tr>
<td>PT 741</td>
<td>THERAPEUTIC EXERCISE II</td>
<td>3</td>
</tr>
<tr>
<td>PT 743</td>
<td>BUSINESS AND ADMINISTRATION IN PHYSICAL THERAPY</td>
<td>3</td>
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<tr>
<td>PT 745</td>
<td>BASICS OF PATIENT MANAGEMENT</td>
<td>6</td>
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<tr>
<td>PT 746</td>
<td>DISORDERS OF THE MUSCULOSKELETAL SYSTEM</td>
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<tr>
<td>PT 748</td>
<td>THERAPEUTIC MODALITIES</td>
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<tr>
<td>PT 750</td>
<td>CLINICAL BIOMECHANICS &amp; GAIT</td>
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<tr>
<td>PT 752</td>
<td>PROSTHETICS AND ORTHOTICS</td>
<td>3</td>
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<td>PT 760</td>
<td>PHARMACOLOGY</td>
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<tr>
<td>PT 761</td>
<td>RESEARCH METHODS AND EVIDENCE BASED PRACTICE</td>
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<tr>
<td>PT 762</td>
<td>(Pediatric Rehabilitation)</td>
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<tr>
<td>PT 771</td>
<td>(Clinical Experience I: 6 - week)</td>
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<tr>
<td>PT 772</td>
<td>(Clinical Experience II: 4 - week)</td>
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<tr>
<td>PT 773</td>
<td>(Clinical Experience III: 6 - week)</td>
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<tr>
<td>PT 774</td>
<td>(Clinical Experience IV: 6 - week)</td>
<td>8</td>
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</tbody>
</table>
Major Code: 7721

School of Social and Behavioral Health Sciences

The School of Social and Behavioral Health Sciences comprises the fields of health management and policy, health promotion and health behavior, and human development and family sciences. These disciplinary approaches use social and behavioral sciences to improve understanding of the factors that influence the health and well-being of individuals, families, and communities. In addition, these fields develop sound policy, programs, and interventions to improve health and well-being at multiple levels. Finally, through our curricula, we develop the next generation of globally minded public health and human sciences professionals.

The School of Social and Behavioral Health Sciences houses the undergraduate degrees of Human Development and Family Sciences and Public Health.

The school also houses the MS and PhD in Human Development and Family Studies (http://health.oregonstate.edu/degrees/graduate/hdfs/).

The school houses the following options of the Master of Public Health (http://health.oregonstate.edu/degrees/graduate/public-health/mph/) (MPH): health management and policy, and health promotion and health behavior.

The school also houses the following concentrations of the Public Health doctoral program (http://health.oregonstate.edu/degrees/graduate/public-health/phd-program/): health policy, and health promotion and health behavior.

Undergraduate Programs

Majors

• Human Development and Family Sciences (p. 928)
  Options:
  • Child Development
  • Early Childhood
  • General Human Development and Family Sciences
  • Human Services

• Public Health (p. 931)
  Options:
  • Health Management and Policy
  • Health Promotion and Health Behavior

Minors

• Early Childhood Development and Education (p. 925)
• Health Management and Policy (p. 927)

Certificate

• Gerontology Certificate (p. 925)

Graduate Programs

Majors

• Human Development and Family Studies (p. 930)

Minors

• Aging Sciences (p. 924)
• Gerontology (p. 926)
• Human Development and Family Studies (p. 930)

Certificate

• Health Management and Policy (p. 927)

Richard A. Settersten, Jr., School Head
433 Waldo Hall
Oregon State University
Corvallis, OR 97331-6406
Phone: 541-737-8902
Email: richard.settersten@oregonstate.edu
Website: http://health.oregonstate.edu/sbhs (http://health.oregonstate.edu/sbhs/)
Faculty Listings: https://health.oregonstate.edu/directory (https://health.oregonstate.edu/directory/)

Human Development and Family Sciences

HDFS 101. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 107. INTRODUCTION TO HUMAN SERVICES. (3 Credits)
An exploration of the human services profession. Emphasis on prevention and early intervention concepts and programs. Development of internship search skills, including an introduction to a wide range of human services organizations.
Equivalent to: HDFS 262

HDFS 199. SPECIAL PROJECTS. (1-16 Credits)
Special projects designed with instructor Graded P/N. This course is repeatable for 16 credits.

HDFS 201. *CONTEMPORARY FAMILIES IN THE U.S.. (3 Credits)
An introduction to families with application to personal life. Focuses on diversity in family structure, social class, race, gender, work and other social institutions. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: FCS 201

HDFS 209. HUMAN SERVICES PRACTICUM. (4 Credits)
Field experience to learn, primarily through observation, how to apply human service strategies and skills to helping individuals and families served by professional agencies. Supervision by agency and instructor. Requires 90 hours of work on-site. Seminar introduces basic theories and skills through readings, discussion and reflective exercises.
Prerequisites: HDFS 107 with C- or better
This course is repeatable for 8 credits.
HDFS 240. *HUMAN SEXUALITY. (3 Credits)
Physiological, psychological, social, and historical influences on sexuality; emphasis on developmental and relationship aspects. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

HDFS 262. INTRODUCTION TO HUMAN SERVICES. (3 Credits)
An exploration of the human services profession. Emphasis on prevention and early intervention concepts and programs. Development of internship search skills, including an introduction to a wide range of human services organizations.
Equivalent to: HDFS 107

HDFS 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 310. HUMAN SERVICES PRACTICUM. (4 Credits)
Field experience to learn, primarily through observation, how to apply human service intervention strategies and skills to helping individuals and families served by professional agencies and organizations. Supervision by agency and instructor. Requires 90 hours of work on-site. Supplementary bi-weekly seminar, readings, and reports. Graded P/N.
Prerequisites: HDFS 262 with C- or better
Equivalent to: HDFS 209
This course is repeatable for 8 credits.

HDFS 311. INFANT AND CHILD DEVELOPMENT. (4 Credits)
Research and theory on development from infancy through middle childhood. Discussion of biological, familial, and sociocultural influences. Development of skills in observing children's behavior.
Equivalent to: HDFS 211

HDFS 312. PARENTING RESEARCH AND APPLICATION. (4 Credits)
Research and theory regarding parenting and parent education, including parenting styles and practices, discipline, parent-child interactions, attachment, and the family context with an emphasis on professional implications for promoting child health and well-being.
Equivalent to: HDFS 312X

HDFS 313. ADOLESCENT DEVELOPMENT. (4 Credits)
Advanced theories and research on physical, social and psychological development during adolescence; emphasizes influences of family, peers, schools and community.

HDFS 314. ADULT DEVELOPMENT AND AGING. (4 Credits)
Advanced theories and research related to developmental changes and stability in early, middle, and late adulthood. Gender issues, personality, cognition, and adaptation.

HDFS 330. FOSTERING LEARNING IN EARLY CHILDHOOD DEVELOPMENT. (4 Credits)
Development of skills in applying theoretical approaches to observing, recording, and interpreting the behavior of young children in order to design interactions that support learning in group settings.
Prerequisites: HDFS 311 with C- or better

HDFS 331. DIRECTED EXPERIENCE IN EARLY CHILDHOOD. (3 Credits)
Placement in early childhood program to focus on guidance techniques, classroom management, and implementation of curricula, based on developmental observation, research, and theory. Supplementary weekly seminar, readings, and reports. Lab/rec. Taught on the OSU-Cascades campus only.
Prerequisites: (HDFS 311 with C- or better or HDFS 211 with C- or better) and HDFS 330 [C-]
Equivalent to: HDFS 330

HDFS 341. FAMILY STUDIES. (4 Credits)
Study of family forms, family formation, and family change over the human life course is sociohistorical, economic, political, and cultural context.

HDFS 360. CRITICAL THINKING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (4 Credits)
Explores foundations of critical thinking, especially methods for sustaining open-minded inquiry and evaluating evidence and arguments. Current controversies in human development and family policy are targets of debate.

HDFS 361. APPLIED RESEARCH METHODS. (4 Credits)
Basic research methods as they are applied in human development and family studies.

HDFS 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 401. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 405. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 406. PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 410. HUMAN SERVICES INTERNSHIP. (6-12 Credits)
Field experience to learn, primarily through observation, how to apply human service intervention strategies and skills to helping individuals and families served by professional agencies and organizations. Supervision by agency and instructor. Requires 300 hours of work on-site. Seminar includes reflection and constructive criticism processes. Can be taken across 2 consecutive terms (150 hours each) within the same agency. Graded P/N.
Prerequisites: HDFS 107 with C- or better and HDFS 209 [P] and HDFS 462 [C-]
This course is repeatable for 12 credits.

HDFS 430. *CHILD DEVELOPMENT CENTER INTERNSHIP. (12 Credits)
Participation in a research-based model early childhood program focused on student teaching, program development and evaluation, parent education and administration. Placement to be reserved one year in advance. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: HDFS 330 with C- or better

HDFS 431. FAMILY, SCHOOL, AND COMMUNITY COLLABORATION. (3 Credits)
Focus on family, school, community environments and interactions for children from infancy to adolescence. Resources and skills for enhancing child development across these settings are emphasized.
Prerequisites: HDFS 311 with C- or better or HDFS 313 with C- or better
Equivalent to: HDFS 436
HDFS 432. CHILDREN AND YOUTH WITH DISABILITIES. (3 Credits)
Developmental, educational, and family issues related to children and youth with disabilities. Highlights a broad range of human exceptionality, including giftedness.
Equivalent to: HDFS 420
Recommended: 6 credits of HDFS, SOC or PSY.

HDFS 433. EARLY CHILDHOOD INTERNSHIP. (10 Credits)
Students will complete an internship in a Pre-Kindergarten, Kindergarten or First Grade classroom and will focus on curriculum development, implementation and evaluation, individualizing for diverse student needs and communication with students.
Prerequisites: HDFS 311 with C- or better and HDFS 330 [C-] and HDFS 331 [C-]
Recommended: HDFS 261

HDFS 444. FAMILY VIOLENCE AND NEGLECT. (4 Credits)
Examination of the causes and consequences of family abuse and neglect, including child abuse, domestic violence and elder abuse.
Recommended: 6 credits of HDFS, SOC or PSY.

HDFS 447. *FAMILIES AND POVERTY. (4 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HDFS 446, HDFS 447H
HDFS 447H. *FAMILIES AND POVERTY. (4 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HDFS 447

HDFS 460. FAMILY POLICY. (4 Credits)
Family policies aim to protect, promote, and strengthen families by addressing one or more of the five explicit functions families perform: (a) family formation, (b) partner relationships, (c) economic support, (d) childrearing, and (e) caregiving. This course will explore the relationships between family policies and family functioning using state, federal, and international policy examples. By reviewing theoretical frameworks for conceptualizing family policy, students will assess the consequences policies may have for family well-being.

HDFS 461. *PROGRAM DEVELOPMENT AND PROPOSAL WRITING. (4 Credits)
Principles of program development and evaluation applied to the development of a proposal for a human services program; analysis of needs and resources, identification of empirically-based strategies, and assessment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: HDFS 360 with C- or better and HDFS 361 [C-]

HDFS 462. PROFESSIONAL HELPING SKILLS. (4 Credits)
Exploration of collaborative, strengths-based methods to resolve individual, family, and community problems. Application of ethical standards to case study, with emphasis on the values of human dignity and social justice. Development of basic helping skills within an empowerment framework.
Prerequisites: HDFS 262 with C- or better and HDFS 310 [P]

HDFS 465. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
Equivalent to: HDFS 465H
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY.

HDFS 465H. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
Attributes: HNRS – Honors Course Designator
Equivalent to: HDFS 465
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY

HDFS 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: HDFS 499H
This course is repeatable for 16 credits.

HDFS 499H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 501. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

HDFS 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 506. SPECIAL PROBLEMS/SPECIAL PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 510. INTERNSHIP. (3-15 Credits)
This course is repeatable for 16 credits.

HDFS 511. THEORIES OF HUMAN DEVELOPMENT. (4 Credits)
Critical examination of significant theories of human development. Emphasizes evolution of theories and impact on current human development research.

HDFS 516. CHILD DEVELOPMENT. (4 Credits)
Study of theories, concepts, and issues related to physical, cognitive, social, and emotional development in infants and children. Covers family contexts, risk and resilience, nature/nurture issues, critical/sensitive periods, the importance of early experience, and the relationship between basic and applied research.
Recommended: 15 quarter credits of social and behavioral sciences.
HDFS 517. ADOLESCENT DEVELOPMENT. (4 Credits)
Study of theories, concepts, and issues related to biological, cognitive, social, and emotional development in adolescents. Covers identity formation, family contexts, adolescent sexuality, societal contexts for adolescent development, and risk and resilience processes.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 518. ADULT DEVELOPMENT AND AGING. (4 Credits)
Study of theories, concepts, and issues related to biological, cognitive, social, and emotional development throughout adulthood. Covers life transitions, stress-related growth, optimal aging, wisdom, and developmental methods.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 519. THE LIFE COURSE. (4 Credits)
Introduces students to key concepts, principles, and controversies in life-course studies. Emphasizes how the nature and rhythm of the life course is structured by time and place. Examines how the lives of individuals and groups are shaped by history, demography, social institutions, states and policies, and culture.

HDFS 529. INTRODUCTORY DATA ANALYSIS WITH SAS. (1 Credit)
Introduction to basic statistical concepts and the use of the SAS software for data analysis. Graded P/N.

HDFS 530. RESEARCH IN HUMAN DEVELOPMENT AND FAMILY SCIENCES I. (4 Credits)
An overview of research design, measurement, sampling and evaluation research. Introduces computer applications for data collection and analysis. Lec/lab.
Recommended: Undergraduate statistics and 12 credits of social science courses.

HDFS 531. APPLIED QUANTITATIVE METHODS I: ANOVA. (4 Credits)
Principles and application of general linear models for categorical predictors and repeated measures designs (e.g., ANOVA).
Prerequisites: HDFS 529 with B- or better

HDFS 532. APPLIED QUANTITATIVE METHODS II: LINEAR REGRESSION. (4 Credits)
Principles and application of general linear models for continuous predictors (e.g., multiple regression).
Prerequisites: HDFS 531 with B- or better
Equivalent to: HDFS 632

HDFS 533. SOCIAL POLICY AND HUMAN DEVELOPMENT. (4 Credits)
Probes how policies and governments affect human development over the life course. Examines experiences in family, education, work, and health. Families are a central lens for examining effects. Offered alternate years.
Equivalent to: HOEC 533

HDFS 534. SOCIAL PROGRAM AND POLICY EVALUATION. (4 Credits)
Models of evaluation and application of applied research methods to social programs and policies.
Prerequisites: HDFS 531 with C or better
Equivalent to: HOEC 534

HDFS 538. QUALITATIVE RESEARCH METHODS I. (4 Credits)
Critical survey of qualitative approaches in social science research. Examines historical roots, epistemological perspectives, and ethical issues. Includes ethnographic and observational methods, interview, grounded theory, case study, and participatory approaches.
Equivalent to: HDFS 635
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 539. QUALITATIVE METHODS II. (4 Credits)
Critical survey of qualitative approaches in social science research. Examines historical roots, epistemological perspectives, and ethical issues. Includes ethnographic and observational methods, interview, grounded theory, case study, and participatory approaches. Application of qualitative methods through completion of a qualitative research project.
Prerequisites: HDFS 538 with C or better

HDFS 541. FAMILY STUDIES. (4 Credits)
Critical survey of current research in family studies with a focus on diverse family structures and processes.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 546. THEORIES OF FAMILY STUDIES. (4 Credits)
An overview of the major theoretical perspectives used in the study of families. Issues of theory construction and evaluation are also covered. Course goal is to enable the student to apply conceptual frameworks to a particular area of interest.
Equivalent to: HDFS 547

HDFS 547. FAMILIES AND POVERTY. (3 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families.
Equivalent to: HDFS 546

HDFS 565. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY.

HDFS 587. SOCIAL GERONTOLOGY. (3 Credits)
An introduction to aging research targeted toward understanding demographics of aging societies, lifespan theories, methods of aging research, psychosocial aging processes, family and caregiving issues, housing and long-term care, and current social policies.

HDFS 601. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 602. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

HDFS 605. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 606. SPECIAL PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 610. PRACTICUM/INTERNSHIP. (3-15 Credits)
This course is repeatable for 16 credits.

HDFS 616. ADVANCED TOPICS IN CHILD-ADOLESCENT DEVELOPMENT. (3 Credits)
Advanced critical study of theory and research related to specific topics of social, emotional, and cognitive development during infancy, childhood and/or adolescence.
This course is repeatable for 6 credits.
HDFS 617. ADVANCED TOPICS IN ADULT DEVELOPMENT AND AGING. (3 Credits)
Advanced critical study of theory and research related to specific topics of social and emotional development and stability in adulthood, including later life.

This course is repeatable for 9 credits.

HDFS 630. QUANTITATIVE METHODS IN FAMILY AND INDIVIDUAL DEVELOPMENT. (3 Credits)
Advanced quantitative techniques in human development and family studies. Includes longitudinal designs, structural equation modes. Content varies with each offering.

Prerequisites: HDFS 532 with B- or better

This course is repeatable for 9 credits.

HDFS 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotions.

Recommended: 9 credits of public health or HDFS graduate coursework

HDFS 665. TEACHING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (1 Credit)
Principles and practices of pedagogy in human development and family sciences related to both on-campus and Ecampus instruction. Graded P/N.

This course is repeatable for 6 credits.

HDFS 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging of African-American, Latino, and Asian-Pacific Islander elderly. Taught spring term even years. CROSSLISTED as H 685/HDFS 685.

Equivalent to: H 685

Recommended: 9 credits of public health or HDFS graduate coursework

HDFS 699. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 8 credits.

HDFS 808. WORKSHOP. (1-16 Credits)
PREREQ: Application to Early Childhood Leadership Directions.

This course is repeatable for 16 credits.

Public Health

H 100. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.

Equivalent to: H 100H

H 100H. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.

Attributes: HNRS – Honors Course Designator

Equivalent to: H 100

H 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

H 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 210. *INTRODUCTION TO THE HEALTH CARE SYSTEM. (3 Credits)
Provides tools to understand and critically assess the health care delivery system, its components, and the challenges created by its structure. The health care system will be considered from the perspective of several main players [e.g., patients, hospitals, doctors, health plans]. (Bacc Core Course)

Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 220. INTRODUCTION TO HEALTH DATA ANALYSIS. (3 Credits)
Introduction to the application of biostatistics and probability to the health sciences. Topics include quantitative analysis and inference, statistical methods in the biosciences, and quantitative study to evaluate and control health problems.

Recommended: MTH 105 or MTH 111 or higher mathematics.

H 225. *SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS. (4 Credits)
Overview of the macro (social/system/environmental) and micro (individual) contributors to premature disease, disability and population health. Selected behavioral theories supporting health risks and strategies for the prevention of premature disease/disability and the promotion of health. (Bacc Core Course)

Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 250. INTRODUCTION TO HEALTH CARE MANAGEMENT. (3 Credits)
Participants will learn key principles, practices and personalities of health care management. The content is broadly applicable to health care enterprises of every kind: public health organizations, physician practices and clinics, hospitals and health systems, agencies and service organizations, for-profit firms, not-for-profit enterprises, etc.

Prerequisites: H 210 (may be taken concurrently) with C- or better

H 309. PRACTICUM IN HEALTH CARE SERVICES. (3-6 Credits)
Supervised work experience in a health care service setting or health-related agency or program. Weekly progress reports and post-experience summary report and evaluation will be expected. Preplanned with instructor approval. Open to health care administration majors. Graded P/N.

This course is repeatable for 12 credits.

H 310. HEALTH FIELD EXPERIENCES. (3-6 Credits)
Introductory field experience in a health or health-related worksite. Graded P/N.

Prerequisites: H 210 with C- or better

This course is repeatable for 12 credits.

H 312. *HIV/AIDS AND STIS IN MODERN SOCIETY. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of AIDS and other sexually transmitted diseases in contemporary society; emphasis on social, psychological, legal, economic, and ethical issues surrounding these diseases. (Bacc Core Course)

Attributes: CPSI – Core, Synth, Global Issues

Equivalent to: H 312H

H 319. INTRODUCTION TO HEALTH POLICY. (3 Credits)
Describe the policy development process, including problem conceptualization, agenda setting, role of interest groups and public opinion, analysis of alternatives and selection of policy alternative.

Prerequisites: H 210 with C- or better and PS 201 [C-]
H 320. INTRODUCTION TO HUMAN DISEASE. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of communicable and noncommunicable diseases in human populations. Special emphasis on disease prevention and health promotion in the high risk diseases of modern, industrialized society.

H 333. *GLOBAL PUBLIC HEALTH. (3 Credits)
Introduction to the field of global health, its history, methods, and key principle; understanding global health inequities through case studies; overview of major global health prevention programs. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 344. *FOUNDATIONS OF ENVIRONMENTAL HEALTH. (3 Credits)
Introductory course examining environmentally-linked disease, and health effects associated with toxic substances, food quality, pesticides, air, water, and noise pollution, and solid/hazardous wastes.

H 349. PEER HELPER SKILLS DEVELOPMENT. (3 Credits)
Prepares the student for an active role as a peer helper in alcohol and drug abuse prevention and health education. Course work will include: drug, alcohol, addiction and other related health issues, basic listening and communication skills, conflict resolution, crisis recognition and referral. A major component will be affective learning situations designed to promote self-awareness and personal growth.

H 364. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation, decision-making, and self-responsibility in treatment and educational approaches to prevention.
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364H

H 364H. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation.
Attributes: HNRS – Honors Course Designator
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364

H 376. EVIDENCE-BASED HEALTH PROMOTION. (3 Credits)
Future health professionals will learn what makes a successful health promotion program. Students will learn about research-tested programs that are effective for promoting health in community, clinical, and educational settings. Students will begin to develop the skills needed to critically examine evidence in the field and select programs to address current public health issues.
Prerequisites: H 100 with C- or better and H 225 [C-]

H 385. SAFETY AND HEALTH STANDARDS AND LAWS. (3 Credits)
Emphasis on the Occupational Safety and Health Act; study includes the scope and duties under the act, enforcement, and adjudication procedures and OSHA litigation; components of Oregon-OSHA.

H 388. *GLOBAL ENVIRONMENTAL HEALTH. (3 Credits)
An overview of global environmental issues, including climate change, air pollution, water, e-waste, and metals, and their impacts on human health. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
H 421. MENTAL HEALTH. (3 Credits)
Examination of social, governmental, legal and individual mental health issues. Brief overview of some major mental disorders.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 422. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging.
Recommended: 9 credits of health course work.

H 425. FOUNDATIONS OF EPIDEMIOLOGY. (3 Credits)
Measures of disease frequency; measures of effect; association and causation; sources of inaccuracy; experimental and observational study designs. Lec/rec.
Prerequisites: H 220 with C- or better or ST 201 with C- or better or ST 314 with C- or better or ST 351 with C- or better

H 431. HEALTH CARE MARKETING. (3 Credits)
Principles, elements and methods of marketing health care services. Role of the consumer, governing body, administration and medical staff as well as impact of professional ethics.

H 432. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economic principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.
Prerequisites: (ECON 201 with C- or better or ECON 201H with C- or better) and H 210 [C-]

H 434. *HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 210 with C- or better and H 250 [C-] and WR 222 [C-]

H 436. ADVANCED TOPICS IN HEALTH CARE MANAGEMENT. (3 Credits)
Covers how health services are governed and organized; how health care organizations assess and adapt to change; constraints/opportunities in shaping organizational performance; leadership; strategic decision-making and the use of evidence-based management in health care.
Prerequisites: H 210 with C- or better and H 250 [C-]

H 445. *OCCUPATIONAL HEALTH. (3 Credits)
Current and historical topics in the area of occupational health, with particular emphasis on the types of materials that produce human health effects; clinical and epidemiologic data used to assess the public health importance of occupational pollutants and to evaluate control strategies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

H 448. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Prerequisites: H 344 with C- or better
Recommended: One term of basic chemistry

H 449. MASS MEDIA AND HEALTH. (3 Credits)
Designed to examine the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public-health campaigns.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 457. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Prerequisites: BA 215 with C- or better and H 210 [C-] and H 250 [C-]

H 458. REIMBURSEMENT MECHANISMS. (3 Credits)
Introduces and analyzes the different types of healthcare reimbursement methodologies used in the U.S. healthcare system.
Prerequisites: H 210 with C- or better

H 461. SEXUALITY: A HEALTH SCIENCE PERSPECTIVE. (3 Credits)
Exploration of the meaning of sexuality from a variety of contemporary health science perspectives; aspects of sex and sexuality fundamental to total health; issues central to the health educator role examined.

H 465. *PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women’s health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Recommended: 6 credits in public health.

H 467. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 468. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 474. PUBLIC HEALTH AND VIOLENCE IN SOCIETY. (3 Credits)
Examination of violence as a major public health issue. Historical, social, environmental, economic, behavioral and psychological aspects of assaultive violence, spousal abuse, rape and sexual assault, child abuse, child sexual abuse, suicide, the effects of the media on violence, drug abuse and violence, and related public health problems in contemporary American society. Emphasis on health and the efficacy of current efforts aimed at ameliorating these problems and potential for alternative public health models for prevention and intervention.

H 476. *PLANNING AND EVALUATING HEALTH PROMOTION PROGRAMS. (4 Credits)
A systematic approach to planning, implementing and evaluating health promotion programs in a variety of health related settings. Students will be writing a series of drafts to effectively develop a health promotion program plan. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 225 with C- or better and H 320 [C-]

H 477. DIETARY INTERVENTIONS FOR PUBLIC HEALTH. (3 Credits)
A public health perspective on the practice of population-based dietary intervention. Examination of relevant theories, research, and practice that pertain to health promoters/educators.
Prerequisites: NUTR 225 with C- or better
Equivalent to: NUTR 477
H 480. UNDERGRADUATE EOH SEMINAR. (1 Credit)
Explores current topics in environmental health and safety. EOH faculty will discuss their current research interests; EOH graduate student speakers will share their environmental health and safety internship experiences. Documentaries will be viewed to introduce topics of discussion. Features will be discussions relating directly to ongoing, current environmental/occupational health crises, both in the United States and around the world. Graded P/N. This course is repeatable for 6 credits.

H 489. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.

H 491. SELECTED TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year. Equivalent to: H 491H
This course is repeatable for 2 credits.

H 491H. SPECIAL TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year. Attributes: HNRS – Honors Course Designator Equivalent to: H 491
This course is repeatable for 6 credits.

H 494. APPLIED ERGONOMICS. (3 Credits)
Principles of occupational ergonomics for managing optimal worker performance and well-being.

H 495. DESIGN FOR ENVIRONMENT, SAFETY, AND HEALTH. (3 Credits)
Systematic consideration of environmental, safety, and health concerns at the earliest possible stage in the lifecycle design engineering of products, technologies, and manufacturing processes.

H 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

H 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 507. SEMINAR. (1-16 Credits)
Section 1. Internship (1). Graded P/N. This course is repeatable for 16 credits.

H 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 509. PRACTICUM. (1-16 Credits)
Supervised work experience in a public health or health care administration setting. Open to majors in public health. Graded P/N. This course is repeatable for 16 credits.

H 510. INTERNSHIP. (1-16 Credits)
Directed field experience with participation in a community, worksite, or health agency program. Experience is individually arranged to meet student needs. Graded P/N. This course is repeatable for 16 credits.

H 511. COMMUNITY, CULTURE, AND GLOBAL HEALTH. (3 Credits)
Overview of health issues across cultures, ethnic groups, and regional/national boundaries from a critical and interdisciplinary perspective. Special emphasis on understanding social and behavioral factors that influence health in underserved communities/groups, especially ethnic/racial minorities, women, children, and migrants.

H 512. INTRODUCTION TO ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES. (3 Credits)
Introduction to environmental and occupational health. Hazards affecting human health are examined in the context of current social, political and regulatory pressures.

H 513. INTEGRATED APPROACH TO PUBLIC HEALTH. (12 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health.

H 514. ENVIRONMENT, SAFETY AND HEALTH SEMINAR. (1 Credit)
One-credit graduate seminar on current topics of interest and importance to the environmental health and occupational safety field. Critical reading of research publications, discussion of controversial issues facing ESH professionals, and/or presentation of current ESH research. This course is repeatable for 3 credits.

H 515. RESEARCH METHODS IN SOCIAL AND BEHAVIORAL HEALTH SCIENCES. (3 Credits)
Provides an introduction to quantitative research methods and design. Topics include definition of research problems and questions, hypothesis generation, research design, sampling, variable definition and measurement, data collection, and ethical considerations. Also provides a brief introduction to qualitative and mixed methods.

H 516. RESEARCH METHODS IN GLOBAL HEALTH. (3 Credits)
Overview of research methods used to understand health, illness, health care, and health-seeking behavior in international settings. Special emphasis on the use of qualitative and mixed methods in international health research.

H 518. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Explores key ethical issues in the context of public health practice; codes and guidelines for ethical conduct of public health practice; issues related to social accountability, vulnerable populations, and ethical framework for community engagement.

H 519. DISPLACEMENT, MIGRATION, AND GLOBAL HEALTH. (3 Credits)
Critical examination of health of displaced/migrant populations with an emphasis on health disparities and social determinants. Understanding intersections of humanitarianism, migration, vulnerability, and displacement from a global health perspective.

H 520. HEALTH DISPARITIES. (3 Credits)
Health disparities based on race/ethnicity, culture, social class, and rural/urban residence, among others; strategies to reduce disparities, promote health, and prevent disease in diverse populations.

H 521. MENTAL HEALTH. (3 Credits)
Focus upon mental health policy development, in relation to federal and state government services and regulations, implementation of services.
H 522. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging.
Recommended: 9 credits of public health course work.

H 523. FOUNDATIONS OF PUBLIC HEALTH. (4 Credits)
Fundamental principles, concepts and tools used in public health to promote the health of populations. Using a combination of case study method, lecture and discussion, students will develop a broad understanding of public health and recognition of how discipline-specializations address the social, behavioral and environmental determinants of public health.

H 524. INTRODUCTION TO BIOSTATISTICS. (4 Credits)
Quantitative analysis and interpretation of health data including probability distributions, estimation of effects, and hypothesis-tests such as Chi-square, one-way ANOVA, and simple linear regression.

H 525. EPIDEMIOLOGICAL METHODS I. (3 Credits)
Introduction to the concepts and methods of epidemiology. Topics include measures of population health, screening, study design, measures of association, and interpretation of epidemiological data.
Prerequisites: H 513 with B- or better or H 535 with B- or better

H 526. EPIDEMIOLOGIC METHODS II. (3 Credits)
Concepts and methods of epidemiological analysis; standardization; stratified analysis; confounding and its control; planning and conducting epidemiologic research; role of multivariate analysis in epidemiologic research.
Prerequisites: H 524 with B- or better and H 525 [B-]

H 527. CRITICAL ASSESSMENT OF INTERNATIONAL HEALTH PROGRAMS. (3 Credits)
Introduces the critical evaluation framework of assessing international health development programs, based on self-determination and community ownership principles. The framework of assessment method includes three levels: upstream evaluation, midstream evaluation, and downstream evaluation.
Recommended: H 528 and H 529

H 528. GLOBAL HEALTH ISSUES. (3 Credits)
Examines major issues in health developments of global significance, their causes and impacts on international health, and methods and strategies to address them.

H 529. INTERNATIONAL HEALTH. (3 Credits)
Overview of the epidemiological, economic, political, sociological, and cultural factors that impact on international health. Special emphasis on the methods of prevention/intervention utilized in coping with health problems on an international level.

H 530. HEALTH POLICY ANALYSIS AND POLITICS. (3 Credits)
Examination of current health policy issues affecting health care programs, services, and organization as well as the role of politics in public health and health policy. Exploration of processes by which health policy proposals are generated, promoted, defeated, modified and implemented.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 532. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economics principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.
Recommended: ECON 201

H 533. HEALTH SYSTEMS ORGANIZATION. (3 Credits)
Examines the nature of health and health care services and reviews the role of government and the free market on health services. Alternative ways of organizing, financing, and delivery of health care services are explored.

H 534. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access.

H 535. INTERPRETING EPIDEMIOLOGIC EVIDENCE. (3 Credits)
Intended for students in the human sciences and allied health fields. Introduces basic epidemiology concepts. Topics will include measures of disease frequency, assessing population health, causal logic, quantifying associations between exposures and health outcomes, epidemiologic study design, and threats to study validity (random error, bias, confounding). Examples focus on application of epidemiological methods to a variety of health-related fields.

H 536. HEALTHCARE ORGANIZATION LEADERSHIP THEORY AND BEHAVIOR. (3 Credits)
Overview of organization theory and behavior in health care organizations. Emphasis is on developing an understanding of the factors and forces that influence the structures, behaviors, and operations of health care delivery organizations. This understanding will be developed through consideration of organizations, their environments, and the roles of individuals working in management.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 537. INJURY EPIDEMIOLOGY. (3 Credits)
An overview of the distribution and determinants of injuries, methodological issues specific to injury epidemiology, and approaches to injury control.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 513 with B- or better
Recommended: Graduate epidemiology training

H 538. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, and their financial reimbursement mechanisms.

H 540. WATER AND HUMAN HEALTH. (3 Credits)
Critically examine the complex relationship between water quality, human activities, and population health.

H 541. AIR QUALITY AND HUMAN HEALTH. (3 Credits)
Examination of the major sources of air pollution, its impact on ecosystems and climate change, and population health. Will also discuss technologies and introduce regulations that are used to control air pollutants.

H 542. ENVIRONMENTAL AND OCCUPATIONAL HEALTH RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern environmental and occupational risk analysis and how they are utilized to make evidence-based decisions by regulatory agencies.
H 543. EXPOSURE SCIENCE I. (4 Credits)
Overview of the concepts, principles and practices in modern environmental and occupational exposure assessment. Exposure Science I provides a broad introduction to environmental and occupational exposure assessment methods, while Exposure Science II focuses on sampling and measurement methods.

H 544. ENVIRONMENTAL AND OCCUPATIONAL EPIDEMIOLOGY. (3 Credits)
Examines exposure assessment methodology and epidemiological study designs that are commonly used in environmental and occupational health science in order to characterize the impact of environmental and occupational exposures on population health.
Prerequisites: H 525 with C or better
Recommended: Graduate level statistics course

H 546. PHYSICAL AGENTS AND HUMAN HEALTH. (3 Credits)
Focus on physical agents (heat, noise, vibration, radiation) and health risks associated with these agents. It covers the range and sources of exposure to physical agents, methods of characterizing these exposures, effects on human health, and the regulations/standards that set limits for physical agents. Lec/lab.

H 547. GIS AND PUBLIC HEALTH. (4 Credits)
Applications of geographic information systems (GIS) to public health are reviewed, including mapping, spatial analysis methods, estimating access, and exposure assessment. This course is geared toward individuals involved in public health who have no (or introductory level) knowledge of GIS. Lec/lab.

H 548. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Recommended: H 344 with a grade of C- or better and one term of basic chemistry.

H 549. MASS MEDIA AND HEALTH. (3 Credits)
Examines the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public health campaigns.
Prerequisites: H 571 with C or better

H 550. SOCIAL EPIDEMIOLOGY. (3 Credits)
Explores the social determinants of health at the population level. Primary focus is on introduction to methods specific to social epidemiology, but will also provide an overview of current understanding of the empirical associations between social factors and health.
Prerequisites: H 525 with B or better
Recommended: Introductory course in epidemiology

H 551. APPLIED EPIDEMIOLOGICAL ANALYSIS OF SECONDARY DATA. (3 Credits)
Practical experience performing a hypothesis-driven epidemiological analysis utilizing secondary surveillance or other appropriate data set, writing an analytical plan, appropriate programming for the analysis (using STATA or SAS), understanding the analysis output, preparing tables, and interpreting results.
Prerequisites: H 526 with B- or better and H 560 [B-] and H 580 [B-]

H 552. DISASTER EPIDEMIOLOGY. (3 Credits)
Describe the impact of natural and manmade disasters on human health, understand epidemiologic methods specific to disasters, and apply fundamental epidemiologic methods to identify and characterize disaster-related adverse health outcomes.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 554. EPIDEMIOLOGY OF AGING. (3 Credits)
An overview of the core principles of the epidemiology of aging is provided. There will be an emphasis on health and disease processes in older adults. Students will learn essential study design and analytic issues that may arise in studies of aging.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 555. CANCER EPIDEMIOLOGY. (3 Credits)
Introduction to basic concepts and methodology in cancer epidemiology.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better

H 556. STRATEGIC MANAGEMENT OF HEALTH SERVICE ORGANIZATIONS. (3 Credits)
Theories and methodologies of long-range planning and strategic management in health care organizations.

H 557. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Recommended: H 210 and H 250

H 558. REIMBURSEMENT MECHANISMS. (3 Credits)
Techniques used in cost-effectiveness analysis. Examples are drawn from the public health and health economics literature.

H 560. PUBLIC HEALTH SURVEILLANCE. (3 Credits)
An introduction to public health surveillance systems (national and international) for chronic and infectious diseases. Utility of existing surveillance systems for secondary epidemiological data analysis.
Prerequisites: H 524 with B- or better and H 525 [B-]

H 562. INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Understand epidemiologic methods specific to infectious diseases, apply fundamental epidemiologic methods to infectious disease questions, and describe the broad trends in global infectious disease burden. The application methods and principles will be explored through lectures, discussions, assignments and writing projects.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or H 514 with B- or better

H 563. PHYSICAL ACTIVITY EPIDEMIOLOGY. (3 Credits)
Physical activity epidemiology will focus on current research, controversial issues, and methodological problems in the epidemiology of physical activity, exercise, and health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 564. COMPUTING TOOLS AND HEALTH DATA ANALYSIS. (3 Credits)
Modern computational biostatistics for analyzing health data, emphasizing important technologies and methods for data processing and understanding of how they work. Topics will evolve over time as new procedures are developed.
Corequisites: H 524

H 565. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women’s health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability.
Equivalent to: BA 565
Recommended: 6 credits in public health.
H 566. DATA MINING IN PUBLIC HEALTH. (3 Credits)
An introduction to high-dimensional data analysis and data mining techniques used as an information technology tool to extract previously unknown and potentially useful information from large databases in biology, medicine, and public health.
Recommended: H 581 and H 564

H 567. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 568. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 569. MATERNAL AND CHILD HEALTH. (3 Credits)
Women's reproductive health and health of children stressing causation, management, and prevention of public health problems. Epidemiological analysis of morbidity and mortality in children and women of childbearing age; impact of social, political and economic influences on the health of women and children; comparison of issues and problems of industrialized versus developing nations. Consideration of health issues of interest to the many diverse racial and ethnic groups of women and children in the U.S. as well as the global village.

H 571. PRINCIPLES OF HEALTH BEHAVIOR. (3 Credits)
Theoretical approaches to behavior change in health promotion/education research and practice; factors influencing health behaviors, ethical behavior change issues, behavioral interventions for special populations.

H 572. COMMUNITY ORGANIZATION FOR HEALTH PROMOTION AND EDUCATION. (3 Credits)
History, theory, and practice of community organizing for health advocacy; focus on group processes, use of media, leadership, coalitions, grass roots methods and social change.

H 573. INTRODUCTION TO MULTILEVEL/HIERARCHICAL MODELS. (3 Credits)
Introduction to the theory and application of hierarchical models to problems in epidemiology and public health. Hierarchical models will be dealt with using both frequentist and Bayesian frameworks.
Recommended: H 581

H 575. EVALUATION OF HEALTH PROMOTION AND EDUCATION PROGRAMS. (3 Credits)
Provides theoretical and practical bases for program evaluation. Develops basic skills in a variety of approaches to evaluation, including techniques that are particularly suitable for evaluating health promotion, community health improvement, and related health and social services programs. Course learning is synthesized through designing an evaluation framework and methodology for a relevant program.
Prerequisites: H 513 with B- or better or H 515 with B- or better or HHS 514 with B- or better

H 576. PROGRAM PLANNING FOR HEALTH/HUMAN SERVICES. (4 Credits)
Provides students with an introduction to the principles of program planning and the development of program plans, with a focus on evidence-based public health/human services. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a program plan.
Prerequisites: (H 515 with C- or better or HHS 514 with C- or better) and H 571 [C] and H 575 [C-]

H 578. INTRODUCTION TO MOLECULAR EPIDEMIOLOGY I. (3 Credits)
A survey of and introduction to the methods and issues arising in genetics and molecular epidemiology, including key biostatistical methods, study designs, and technologies used in the conduct of these studies. Students will gain experience conducting critical reviews of research papers with respect to study design and biostatistical analysis.
Prerequisites: (H 524 with C or better and H 526 [C])
Recommended: Knowledge of and familiarity with basic concepts of molecular biology (DNA replication, transcription, and translation)

H 580. LINEAR REGRESSION AND ANALYSIS OF TIME TO EVENT DATA. (4 Credits)
Multiple linear regression analysis for measurement data and survival analysis methods for time to event health data, including modes of inference, diagnostics, model selection, and reporting conclusions. Lec/lab.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 581. GENERALIZED LINEAR MODELS AND CATEGORICAL DATA ANALYSIS. (4 Credits)
Biostatistical methods focusing on binary and count data will provide a foundation for understanding and implementing generalized linear regression and categorical data models that are commonly used to analyze epidemiological and public health data from cohort, case-control, and clinical trial study designs. Lec/lab.
Recommended: H 580

H 582. ANALYSIS OF CORRELATED HEALTH DATA. (3 Credits)
Biostatistical methods for clustered, repeated measures, and longitudinal correlated health data, with an introduction to applications of linear and generalized linear mixed models and generalized estimating equations.
Prerequisites: H 581 with C or better

H 583. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT. (4 Credits)
Studies the design and management principles and practices in the environment, safety and health field.

H 584. ANALYSIS OF INTERVENTION STUDIES AND CLINICAL TRIALS. (3 Credits)
Principles of data analysis from intervention studies and clinical trials, including professional graphical and tabular presentation, reproducibility and reliability of measurements, and controlling the Type I error rate when analyzing multiple endpoints. Basic principles of designing experiments are also covered including blocking, stratification, interaction, and control of variability.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 585. ENVIRONMENT, SAFETY AND HEALTH POLICY AND LAW. (3 Credits)
Survey of the environment, safety and health policy and law in the United States. Furnishes the basic knowledge and general understanding about policy and law-related issues important to all environmental health and safety professionals.
Recommended: H 385
H 586. BAYESIAN BIOSTATISTICS IN PUBLIC HEALTH. (3 Credits)
An examination of methods for designing and implementing Bayesian analysis to address scientific questions through hands-on experience with health data. This survey course also covers proper interpretation and communication of results from practical Bayesian methods for biostatistics data analysis, with illustrations of the utility of Bayesian ideas in public health.
Prerequisites: H 581 with C or better

H 587. TIME TO EVENT ANALYSIS OF HEALTH DATA. (3 Credits)
Biostatistical models and methods for survival analysis of time to event data that are routinely encountered in biomedical and health research.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 588. APPLIED OCCUPATIONAL SAFETY AND HEALTH. (3 Credits)
The management and technical aspects of a workplace safety and health program are identified and assessed. Students completing the course receive a 30-hour OSHA General Industry card.

H 589. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.

H 590. OCCUPATIONAL ERGONOMICS AND BIOMECHANICS. (3 Credits)
Examines the advanced theories, applications, and contemporary topics of occupational ergonomics and biomechanics. Topics include muscle physiology, work-related musculoskeletal disorders, assessing biomechanical exposure in the workplace, various material handling assessment tools, 3-Dimensional Static Strength Prediction Program, human vibrations, and implementing ergonomic interventions.

H 591. SELECTED TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.
This course is repeatable for 9 credits.

H 592. SPATIAL EPIDEMIOLOGY. (3 Credits)
An introduction to methods in spatial epidemiology is provided, including spatial exploration of health data, quantifying spatial patterns and clusters, spatial exposure assessment, and explaining patterns and associations.
Prerequisites: H 547 with C or better and H 581 [C]

H 593. REPRODUCTIVE EPIDEMIOLOGY. (3 Credits)
Focuses on current research, controversial issues, and methodological problems in the epidemiology of reproductive health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
Recommended: H 524

H 594. APPLIED ERGONOMICS. (3 Credits)
Principles of occupational ergonomics for managing optimal worker performance and well-being.

H 595. DESIGN FOR ENVIRONMENT, SAFETY, AND HEALTH. (3 Credits)
Systematic consideration of environmental, safety, and health concerns at the earliest possible stage in the lifecycle design engineering of products, technologies, and manufacturing processes.

H 596. HEALTHCARE EPIDEMIOLOGY. (3 Credits)
Focus on current research, controversial issues, and methodological problems in the epidemiology of healthcare. Topics include institutional infection control, medical errors, screening and diagnostic testing, cost-effectiveness, and others related to the delivery and assessment of healthcare, with a focus on the US healthcare system specifically.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
Recommended: H 524

H 597. METHODS IN FOODBORNE DISEASE OUTBREAK INVESTIGATION. (3 Credits)
Focuses on the practical basis for developing and implementing methods for foodborne disease outbreak detection, investigation and control, using recent outbreaks to highlight underlying principles. Biological characteristics of major foodborne disease pathogens, clinical features of the illnesses its causes and epidemiologic presentations of foodborne outbreaks will be reviewed. The implications of these characteristics will be discussed in a problem solving, interactive format that examines theory and practice in the context of recent outbreaks. Strategies to promote timely decision-making will be emphasized.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 598. HEALTH POLICY ANALYSIS METHODS. (3 Credits)
Analysis of public policies affecting health care programs, services and organizations and the impact of those programs on citizens. Health services research methods, including data sources for health policy research and health policy literature.
Prerequisites: H 513 with B- or better and H 533 [B-]

H 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

H 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

H 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

H 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 611. INTRODUCTION TO SYSTEMATIC LITERATURE REVIEWS. (3 Credits)
Students will learn how to apply systematic review methodology to a research question of their choice and understand how literature reviews inform evidence-based decision-making. Examples will focus on applying literature reviews to public health, clinical science, and biomedical research.
H 612. DOCTORAL SEMINAR IN PUBLIC HEALTH: RESEARCH AND PRACTICE. (1 Credit)
Contemporary research and professional issues specific to the discipline of public health. Includes responsible conduct of research, writing for publication, professional development and leadership, and faculty research in public health.
This course is repeatable for 9 credits.

H 613. INDEPENDENT RESEARCH PROJECT. (1-9 Credits)
Independent research project for PhD students, including research design, execution or research, and the formal presentation of findings in written form. Student will develop an original research topic based on knowledge and review of the literature in a public health-relevant area of inquiry. Graded P/N.
This course is repeatable for 9 credits.

H 614. RESEARCH MANUSCRIPT. (4 Credits)
PhD students write a manuscript to submit to a peer-reviewed journal as part of the course requirements. Graded P/N.

H 615. ADVANCED EVALUATION AND RESEARCH DESIGN. (3 Credits)
Provides an in-depth examination of advanced research designs and methods for establishing causal statements about the efficacy, effectiveness and generalizability of public health and social service interventions designed to alter public health and social risk or protective factors.
Recommended: H 515 and H 575

H 620. ADVANCED TOPICS IN GLOBAL HEALTH INTERVENTION AND PRACTICE. (3 Credits)
Examines the processes and tools involved in planning and evaluating culturally competent health and human service prevention and intervention programs in the global context. Special considerations in program decision-making in the global context (community engagement, cultural competence, sustainability, feasibility, political/ethical issues) will be explored. Provides a key forum for doctoral students to share ongoing developments in their research and practice drawing from fieldwork as well as attended conferences and meetings.

H 622. GLOBAL HEALTH SYSTEMS, POLICY AND POLITICS. (3 Credits)
Focuses on learning to identify key stakeholders in the politics of global health, and to be able to describe political and policy processes involved in negotiating global health decisions. Employment of theories and evidence from both the global North and South to explain political and policy processes affecting public health practice and programs.

H 626. GLOBAL HEALTH SYSTEM FINANCE AND STRENGTHENING. (3 Credits)
Introduces an analytical framework of health system finance strengthening for global health, from local community to national level and international level. Develops the analytical skill and knowledge for examining the source and mechanism of financing health systems and identify, mobilize, organize, and manage domestic and global health resources. Provides training to examine equity and efficiency of financial burden in a health system, and the strategies to strengthen it.

H 630. QUANTITATIVE HEALTH POLICY RESEARCH METHODS I. (4 Credits)
Contemporary doctoral-level quantitative health policy/services research methods emphasizing linear regression models, data sources for health policy research, and health policy research literature.
Prerequisites: H 524 with B- or better

H 632. APPLIED HEALTH ECONOMICS. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing causal inference when potential endogeneity is present.
Prerequisites: H 630 with B- or better

H 635. COST EFFECTIVENESS ANALYSIS IN HEALTH AND MEDICAL CARE. (3 Credits)
The primary objective of this course is to introduce students to cost-effectiveness studies in health and medical care. Covers the core concepts of CEA, quality adjusted life years, cost calculations, and decision rules.

H 638. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, their finance mechanisms, and theoretical foundation behind the selection of certain system of health insurance and finance method.
Prerequisites: H 533 with C or better

H 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotion.
Recommended: 9 credits of public health or HDFS graduate coursework

H 642. ENVIRONMENTAL AND REGULATORY RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern risk analysis and how they are utilized to make evidence-based decisions in public health. Focus will be on real world examples of risk assessment by environmental and occupational regulatory agencies.

H 650. REPORTING RESULTS: WRITING FOR EPIDEMIOLOGY. (3 Credits)
Applied experience writing a scientific paper to disseminate results, including deciding on authorship, preparing a lay summary, revising and responding to peer review, and serving as a reviewer.
Prerequisites: H 526 with B- or better and H 551 [B-] and H 580 [B-]

H 651. ADVANCED EPIDEMIOLOGICAL METHODS. (4 Credits)
Covers advanced topics in epidemiology. Course expands on many of the same topics as H 526, and explores them in greater breadth and depth. Topics include causal theory, measures of disease and association, confounding, selection bias, predictive models, directed acyclic graphs, effect modification, mediation, indirect and direct effects, study design, and other contemporary topics.
Prerequisites: H 526 with B- or better and H 581 [B-]

H 652. CAUSAL INFERENCE IN EPIDEMIOLOGY. (3 Credits)
Discussion of the theoretical framework of causal statistics and the development of modern methods including propensity scores and marginal structural models. Focus is on the inverse probability of treatment weighting; discussion of other estimation methods will be included. Additional topics may include longitudinal causal models, causal mediation, instrumental variables, and other contemporary topics.
Applied examples will be used for illustration.
Prerequisites: H 651 with B- or better
### H 659. QUANTITATIVE HEALTH POLICY RESEARCH METHODS II. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing health care utilization, expenditures, and outcomes data.  
**Prerequisites:** H 630 with B- or better

### H 662. ADVANCED METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Covers advanced methods and principles for infectious disease research, including framing infectious disease issues into testable hypotheses, designing epidemiologic studies using appropriate sampling strategies, and identifying strengths and weaknesses of various epidemiologic research methods.  
**Prerequisites:** H 526 with B- or better and H 562 [B-]

### H 671. ADVANCED THEORIES OF HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of major theories of health behavior (both health compromising and health enhancing).  
**Recommended:** H 571

### H 672. ADVANCED QUALITATIVE METHODS IN HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of the use of qualitative methods in health behavior research and practice.  
**Recommended:** H 515 and SOC 518 and HDFS 538

### H 673. MEASUREMENT OF HEALTH BEHAVIOR CONCEPTS. (4 Credits)
Provides in-depth study and field work for graduate students in public health and related fields of the methods used in the conceptualization, development, and evaluation of quantitative measures of health behavior and related concepts.  
**Recommended:** H 524, H 515, and 3 credits in other quantitative research methods or social behavioral methods (eg. sociology or psychology or health promotion or education programs)

### H 675. DEVELOPMENT OF HEALTH BEHAVIOR INTERVENTIONS. (3 Credits)
Examines the application of social/behavioral theories in health promotion interventions and in conducting intervention research in diverse populations. The course will focus on program development, on implementation strategies, and on translation into practice.  
**Recommended:** H 571 and H 575 and H 576

### H 676. ADVANCED TOPICS IN HEALTH PROMOTION AND HEALTH BEHAVIOR. (3 Credits)
Examines topics of relevance to health promotion and health behavior. Specific topics include current issues and emerging research findings, with a focus on social and behavior science perspectives, analysis of public health problems, and application of principles and practices of health promotion and health behavior.  
*This course is repeatable for 6 credits.*  
**Recommended:** H 515 and H 571

### H 681. ADVANCED TOPICS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY. (3 Credits)
Advanced topics in the environment, safety and health discipline. Content varies with each offering.

### H 682. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY: MOVING FROM RESEARCH TO PRACTICE. (3 Credits)
An examination of research transfer models that can be adapted and implemented to environmental and occupational settings. Case studies and content will vary with each course offering.

### H 683. ADVANCED RESEARCH METHODS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH. (3 Credits)
Covers advanced methods for environmental and occupational health research, including framing environmental and occupational health issues into testable hypotheses, designing appropriate studies, and identifying strengths and weaknesses of different research methods.

### H 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging of African-American, Latino, and Asian-Pacific Islander elderly. Taught spring term even years. CROSSTLISTED as H 685/HDFS 685.  
**Equivalent to:** HDFS 685  
**Recommended:** 9 credits of public health or HDFS graduate coursework

### H 699. SPECIAL STUDIES. (1-16 Credits)
*This course is repeatable for 16 credits.*

## Aging Sciences Graduate Minor

This graduate minor provides interdisciplinary graduate education in the aging sciences through formal course work, research requirements and experiential learning that is aligned with the student’s career goals in aging.

**Minor Code:** 3755

The Aging Sciences minor requires that master’s students select 15 credits from the following courses. Doctoral students must select 18 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BB 650</td>
<td>SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS</td>
<td>3</td>
</tr>
<tr>
<td>CS 607</td>
<td>SEMINAR (Research and Professional Topics in Aging)</td>
<td>4</td>
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<tr>
<td>KIN 607</td>
<td>SEMINAR (Research and Professional Topics in Aging)</td>
<td>4</td>
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<tr>
<td>HDFS 607</td>
<td>SEMINAR (Research and Professional Topics in Aging)</td>
<td>4</td>
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<tr>
<td>GRAD 520</td>
<td>RESPONSIBLE CONDUCT OF RESEARCH</td>
<td>2</td>
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<tr>
<td>HDFS 565</td>
<td>TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES (Behavioral and Social Sciences of Aging)</td>
<td>3</td>
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<tr>
<td><strong>Select 4 or more credits from the following areas:</strong></td>
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<td>4</td>
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</table>

### Computer Science

<table>
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<tr>
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<tbody>
<tr>
<td>CS 519</td>
<td>SELECTED TOPICS IN COMPUTER SCIENCE (Data Visualization)</td>
</tr>
<tr>
<td>CS 519</td>
<td>SELECTED TOPICS IN COMPUTER SCIENCE (Human-Computer Interaction)</td>
</tr>
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### Kinesiology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>KIN 515</td>
<td>MOTOR CONTROL AND MOVEMENT DYSFUNCTION</td>
</tr>
<tr>
<td>KIN 525</td>
<td>BIOMECHANICS OF MUSCULOSKELETAL INJURY</td>
</tr>
<tr>
<td>KIN 550</td>
<td>HEALTH PROMOTION FOR PEOPLE WITH DISABILITIES</td>
</tr>
<tr>
<td>KIN 562</td>
<td>LIFESPAN SPORT AND EXERCISE PSYCHOLOGY</td>
</tr>
<tr>
<td>KIN 599</td>
<td>SPECIAL TOPICS (Bone Physiology)</td>
</tr>
<tr>
<td>or NUTR 599</td>
<td>SPECIAL TOPICS IN NUTRITION</td>
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### Human Development and Family Sciences

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS 518</td>
<td>ADULT DEVELOPMENT AND AGING</td>
</tr>
<tr>
<td>HDFS 587</td>
<td>SOCIAL GERONTOLOGY</td>
</tr>
<tr>
<td>HDFS 617</td>
<td>ADVANCED TOPICS IN ADULT DEVELOPMENT AND AGING</td>
</tr>
</tbody>
</table>
### Gerontology Certificate

**Carolyln Aldwin, Director**  
Program on Gerontology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS 311</td>
<td>INFANT AND CHILD DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 330</td>
<td>FOSTERING LEARNING IN EARLY CHILDHOOD DEVELOPMENT (OSU-Cascades only)</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 331</td>
<td>DIRECTED EXPERIENCE IN EARLY CHILDHOOD (OSU-Cascades only)</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 341</td>
<td>FAMILY STUDIES (OSU-Cascades only)</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 431</td>
<td>FAMILY, SCHOOL, AND COMMUNITY COLLABORATION (OSU-Cascades only)</td>
<td>3</td>
</tr>
<tr>
<td>PSY 201</td>
<td>Mind and Brain (Provided by COCC)</td>
<td>3</td>
</tr>
<tr>
<td>PSY 202</td>
<td>Mind and Society (Provided by COCC)</td>
<td>3</td>
</tr>
</tbody>
</table>

Upper-division electives with HDFS prefix 6

Total Hours 30

* Baccalaureate Core Course (BCC)

### Graduate Study in Gerontology

OSU offers over 20 graduate-level gerontology courses plus field study and research opportunities. There are three ways to pursue significant graduate work in gerontology at OSU:

1. **Gerontology may be selected as an area of concentration for both master's and doctoral degrees in Human Development and Family Studies.** Students choosing this concentration will select adult development and aging course work and research in their major and may choose an integrated minor in gerontology.

2. **Gerontology is an integrated graduate minor (i.e., courses chosen from a variety of schools/departments) available to graduate students in any major field.** The minor requires 18–36 credits, including HDFS 587. The balance of the course work is selected from graduate gerontology courses, field study, and/or research.

3. **Gerontology is an area of study in the Master's of Interdisciplinary Studies (MAIS) program.** MAIS students are required to take a minimum of 15 credits in gerontology, including HDFS 587. The balance of courses is selected from graduate gerontology courses, field study, and/or research.

**Major Code:** C437
Field study or field projects in Gerontology — Any Department

In addition to gerontology courses, seminars, field study (310/410/510/610), research (401/501/601), and projects (406/506/606) in gerontology are offered through the Gerontology Program.

Field study is a vital component of the Gerontology Certificate program. Three to six credits of an approved field experience or an approved research or field project are required. No more than six credits of field study will count toward certificate completion. Field Experience or Internships involve professional level work experience in an agency or organization that serves older adults. To be considered a gerontology field placement, at least half of the student’s time must be spent working with or for older individuals.

Ordinarily, nine credits of gerontology course work must be completed prior to beginning field study. Specific requirements for field study are cooperatively developed by the faculty supervisor, student, and a community agency. The type of field study selected should reflect the student’s career interests, as well as the student’s competencies and the community agency’s needs.

Field study in gerontology must be approved by the Program on Gerontology if it is to be used to meet Certificate requirements. Approval forms are available from the Program on Gerontology.

Electives from list of approved Gerontology Courses

Twelve to 15 credits of gerontology electives are required beyond the gerontology core to complete the minimum of 27 credits of gerontology study.

Additional Requirements

1. A grade of ‘C’ or better in all gerontology courses. Overall GPA of 2.5.
2. Formal application to the program; forms available from the program office in 437 Waldo Hall.
3. Certificate requirements fulfilled within five years following graduation. Students who have not completed certificate requirements upon receipt of the degree may continue as special, postbaccalaureate, or graduate students.

Major Code: C437

Gerontology Graduate Minor

Graduate Areas of Concentration

Gerontology
Gerontology refers to the study of aging, and also includes adult development. The existence of large numbers of individuals over the age of 65 is unprecedented in the history of humankind. In the next ten years, the number of older adults is expected to double in developed countries and quadruple in the developing world. This growth will pose major challenges for societies in addressing the health, economic, and social needs of this population.

To address these challenges, students, researchers, and practitioners in the field of aging will need to take a multidisciplinary approach to solving these challenges, which will require an understanding of biological, psychological, sociocultural, and design and engineering factors. Accordingly, we have designed a multidisciplinary minor, drawing upon faculty across campus, which is tailored to individual student needs.

### Health Management and Policy Minor

Students are required to have a 3.0 GPA and to have one of the gerontology faculty on their committee. Students must take 18 credits but can decide the classes in conjunction with their committee. Sample classes include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 536</td>
<td>HEALTHCARE ORGANIZATION LEADERSHIP THEORY AND BEHAVIOR</td>
<td>3</td>
</tr>
<tr>
<td>H 554</td>
<td>EPIDEMIOLOGY OF AGING</td>
<td>3</td>
</tr>
<tr>
<td>H 558</td>
<td>REIMBURSEMENT MECHANISMS</td>
<td>3</td>
</tr>
<tr>
<td>H 576</td>
<td>PROGRAM PLANNING FOR HEALTH/HUMAN SERVICES</td>
<td>4</td>
</tr>
<tr>
<td>H 568</td>
<td>FINANCING AND ADMINISTRATION OF LONG-TERM CARE</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 518</td>
<td>ADULT DEVELOPMENT AND AGING</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 519</td>
<td>THE LIFE COURSE</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 555</td>
<td>TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES (“Psychosocial Factors in Aging”, “Stress and Coping Across the Lifespan”)</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 587</td>
<td>SOCIAL GERONTOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 617</td>
<td>ADVANCED TOPICS IN ADULT DEVELOPMENT AND AGING</td>
<td>3</td>
</tr>
<tr>
<td>PHL 544</td>
<td>BIOMEDICAL ETHICS</td>
<td>4</td>
</tr>
<tr>
<td>PHL 555</td>
<td>DEATH AND DYING</td>
<td>3</td>
</tr>
<tr>
<td>SOC 532</td>
<td>SOCIOLOGY OF AGING</td>
<td>4</td>
</tr>
</tbody>
</table>

### Health Management and Policy Graduate Certificate

For more details about this graduate certificate, see the school advisor.

### Human Development and Family Sciences Minor

Students minoring in Human Development and Family Sciences will learn how people change across the life course within the contexts of families, schools, work and society. This minor is a perfect complement...
Human Development and Family Sciences Undergraduate Major (BS, HBS)

Also available at OSU-Cascades, OSU-Portland and via Ecampus.

HDFS majors explore how individuals develop and become resilient over time – particularly within the contexts of family, school, work and society. They discover how significant relationships with parents, partners, teachers and friends can influence the ways in which we develop. HDFS majors consider how difficult environments, such as living in poverty, can make lives and relationships more challenging. Finally, they learn to appreciate the diverse ways in which individuals and families thrive and survive.

The BS in Human Development and Family Sciences can be pursued through one of four required options listed below:

1. Child Development (p. 928) (Corvallis campus only)
2. Early Childhood (p. 929) (Cascades campus only)
3. General (p. 929) (All campuses, including Ecampus)
4. Human Services (p. 930) (Corvallis and Cascades)

Note: It is possible to choose more than one option. Students should meet with an advisor in the college’s Office of Student Success in the Women’s Building 105 for additional information.

Major Code: 447

Pre-Human Development and Family Sciences Major Code: 457

Credits Needed to Graduate

180 credits, 60 of which must be upper division. Credits are to include baccalaureate core courses, HDFS core courses, classes required for each option, and electives.

Human Development and Family Sciences Undergraduate Major (BS, HBS)

Also available at OSU-Cascades, OSU-Portland and via Ecampus.

A minor in HDFS will enable students to:

- Explore how individuals develop and become resilient over time – particularly within the context of family, school, work and society.
- Discover how significant relationships with parents, partners, teachers and friends can influence the ways in which we develop over time.
- Consider how difficult circumstances, such as poverty, make lives and relationships more difficult to navigate.
- Appreciate the diverse ways in which individuals and families thrive and survive.

Minor Code: 839

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>HDFS 201</td>
<td>*CONTEMPORARY FAMILIES IN THE U.S.</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 311</td>
<td>INFANT AND CHILD DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 313</td>
<td>ADOLESCENT DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 314</td>
<td>ADULT DEVELOPMENT AND AGING</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 341</td>
<td>FAMILY STUDIES</td>
<td>4</td>
</tr>
</tbody>
</table>

Electives

Select any three courses from the following:

- HDFS 240 *HUMAN SEXUALITY
- HDFS 262 INTRODUCTION TO HUMAN SERVICES
- HDFS 360 CRITICAL THINKING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES
- HDFS 312 PARENTING RESEARCH AND APPLICATION
- HDFS 431 FAMILY, SCHOOL, AND COMMUNITY COLLABORATION
- HDFS 432 CHILDREN AND YOUTH WITH DISABILITIES
- HDFS 444 FAMILY VIOLENCE AND NEGLECT
- HDFS 447 *FAMILIES AND POVERTY
- HDFS 460 FAMILY POLICY

Total Hours: 28-31

* Baccalaureate Core Course (BCC)

Minor Code: 839

1. Child Development (p. 928) (Corvallis campus only)
2. Early Childhood (p. 929) (Cascades campus only)
3. General (p. 929) (All campuses, including Ecampus)
4. Human Services (p. 930) (Corvallis and Cascades)

Note: It is possible to choose more than one option. Students should meet with an advisor in the college’s Office of Student Success in the Women’s Building 105 for additional information.

Major Code: 447

Pre-Human Development and Family Sciences Major Code: 457

Child Development Option

This option is offered within the following major(s):

- Human Development and Family Sciences - College of Public Health and Human Sciences (p. 928)

Through classes and internships, the Child Development option provides students with research-based strategies for supporting children's development. Students develop a strong foundation for careers in
preschools, early intervention, positive youth development, and parenting education. Students will be prepared for graduate work in HDFS, education, special education, psychology and other fields related to child development.

With a double degree in human development and family sciences and education, students can earn dual licensure at the pre-kindergarten and elementary school levels.

**Option Code: 228**

**Child Development Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HDFS 330</td>
<td>FOSTERING LEARNING IN EARLY CHILDHOOD DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 430</td>
<td>*CHILD DEVELOPMENT CENTER INTERNSHIP</td>
<td>12</td>
</tr>
<tr>
<td>HDFS 431</td>
<td>FAMILY, SCHOOL, AND COMMUNITY COLLABORATION</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 432</td>
<td>CHILDREN AND YOUTH WITH DISABILITIES</td>
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Select a minimum of 12 elective credits:

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<tr>
<td>HDFS 201</td>
<td>*CONTEMPORARY FAMILIES IN THE U.S.</td>
<td></td>
</tr>
<tr>
<td>HDFS 262</td>
<td>INTRODUCTION TO HUMAN SERVICES</td>
<td></td>
</tr>
<tr>
<td>HDFS 312</td>
<td>PARENTING RESEARCH AND APPLICATION</td>
<td></td>
</tr>
<tr>
<td>HDFS 444</td>
<td>FAMILY VIOLENCE AND NEGLECT</td>
<td></td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td></td>
</tr>
<tr>
<td>HDFS 460</td>
<td>FAMILY POLICY</td>
<td></td>
</tr>
<tr>
<td>HDFS 465</td>
<td>TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES</td>
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</tr>
</tbody>
</table>

**Total Hours**: 34

* Baccalaureate Core Course (BCC)  
^ Writing Intensive Course (WIC)

**Option Code: 838**

**Early Childhood Option**

This option is offered within the following major(s):

• Human Development and Family Sciences - College of Public Health and Human Sciences (p. 928)

Available only at OSU-Cascades.

This option prepares students to promote lifelong development, learning, and well-being of children and families. Through a focus on the early childhood period from prenatal through age 8 years, students examine dynamics among children, families, schools, communities, and cultures that have lasting impacts throughout life. Practicum and internship experiences prepare students to work directly with children and families in preschools, Head Start programs, child care, early intervention/early childhood special education, or parent and family support. Graduates also create and implement prevention and intervention programs, and pursue graduate study in fields such as education, special education, counseling, human development and family science, psychology, sociology, and social work.

**Option Code: 441**

**Required Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS 330</td>
<td>FOSTERING LEARNING IN EARLY CHILDHOOD DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>HDFS 331</td>
<td>DIRECTED EXPERIENCE IN EARLY CHILDHOOD</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 431</td>
<td>FAMILY, SCHOOL, AND COMMUNITY COLLABORATION</td>
<td>3</td>
</tr>
<tr>
<td>HDFS 432</td>
<td>EARLY CHILDHOOD INTERNSHIP</td>
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**Electives**

Select 12 credits from the following:

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<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>HDFS 201</td>
<td>*CONTEMPORARY FAMILIES IN THE U.S.</td>
<td></td>
</tr>
<tr>
<td>ED 140</td>
<td>Introduction to ECE at COCC</td>
<td></td>
</tr>
<tr>
<td>HDFS 262</td>
<td>INTRODUCTION TO HUMAN SERVICES</td>
<td></td>
</tr>
<tr>
<td>HDFS 312</td>
<td>PARENTING RESEARCH AND APPLICATION</td>
<td></td>
</tr>
<tr>
<td>HDFS 431</td>
<td>DIRECTED EXPERIENCE IN EARLY CHILDHOOD (OSU-Cascades only)</td>
<td></td>
</tr>
<tr>
<td>HDFS 432</td>
<td>CHILDREN AND YOUTH WITH DISABILITIES</td>
<td></td>
</tr>
<tr>
<td>HDFS 444</td>
<td>FAMILY VIOLENCE AND NEGLECT</td>
<td></td>
</tr>
<tr>
<td>HDFS 447</td>
<td>*FAMILIES AND POVERTY</td>
<td></td>
</tr>
<tr>
<td>HDFS 460</td>
<td>FAMILY POLICY</td>
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</table>

**Total Hours**: 17

* Baccalaureate Core Course (BCC)  
^ Writing Intensive Course (WIC)

**Central Oregon Community College**

**Option Code: 838**

**General Human Development and Family Sciences Option**

This option is offered within the following major(s):

• Human Development and Family Sciences - College of Public Health and Human Sciences (p. 928)

Also available at OSU-Cascades, OSU-Portland and via Ecampus.

Students majoring in the General HDFS Option explore development across the life span within the contexts of families, schools, work and society. This unique program provides current knowledge, practical skills and opportunities for hands-on learning to help students excel in fields dedicated to improving the lives of individuals and families.

The General HDFS Option is ideal for students interested in education, social work, allied health sciences, or other helping professions. It is a perfect complement to a minor or a second major in business, education, psychology, sociology, public health and a wide variety of allied health professions, and women, gender, and sexuality studies.
Human Development and Family Studies Graduate Major (MS, PhD)

Graduate Areas of Concentration

**Human development and family studies**

The School of Social and Behavioral Health Sciences offers course work and programs of study in the area of human development and family studies. The Gerontology Program is also administered by the College of Public Health and Human Sciences through the school. Areas of study and degrees granted are described below.

Human Development and Family Studies offers graduate work leading to master of science and doctor of philosophy degrees. Graduate programs take a multidisciplinary approach, preparing students for college and university teaching and research, as well as development, administration, and evaluation of programs serving individuals and families across the lifespan.

Our research is interdisciplinary with signature themes in

a. transitions across the life course,

b. risk and resilience across the life span, and
c. developmental and family research methods.

Our faculty recognizes the critical importance of culture and gender, diversity, and contemporary global perspectives in the discovery of knowledge. We have research emphases in child development, adolescence, adult development and aging, families, rural communities, and cross-national comparison.

Research is an important focus of the Graduate Program in Human Development and Family Studies. The HDFS faculty includes nationally recognized scholars who are widely published in areas such as families and aging; family communication and conflict; child, adolescent, and adult development; intergenerational family relationships; family structure; and gender. We emphasize both quantitative and qualitative methodology.

For more information, contact the Graduate Program in Human Development and Family Studies, College of Public Health and Human Sciences, 437 Waldo Hall, OSU, Corvallis, OR 97331-5102.

**Major Code:** 4470

**Human Development and Family Studies Graduate Minor**

**Minor Code:** 4470

**Public Health Minor**

Also available via Ecampus.

The Public Health minor provides students with a general background in public health. Students pursuing a Public Health major cannot add the Public Health minor.
Minor Code: 496

Students with this minor may not take any of the required courses listed below with S/U grading and must earn a grade of C- or better in all minor coursework and prerequisites, including the 'any other H course' requirement. Students may, however, take additional public health courses not required for the minor with S/U grading.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 100</td>
<td>INTRODUCTION TO PUBLIC HEALTH</td>
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</tr>
<tr>
<td>H 210</td>
<td>*INTRODUCTION TO THE HEALTH CARE SYSTEM</td>
<td>3</td>
</tr>
<tr>
<td>or ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
<td></td>
</tr>
<tr>
<td>H 220</td>
<td>INTRODUCTION TO HEALTH DATA ANALYSIS</td>
<td>3-4</td>
</tr>
<tr>
<td>H 225</td>
<td>*SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
<td>4</td>
</tr>
<tr>
<td>H 319</td>
<td>INTRODUCTION TO HEALTH POLICY</td>
<td>3</td>
</tr>
<tr>
<td>H 320</td>
<td>INTRODUCTION TO HUMAN DISEASE</td>
<td>3</td>
</tr>
<tr>
<td>H 344</td>
<td>*FOUNDATIONS OF ENVIRONMENTAL HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>H 425</td>
<td>FOUNDATIONS OF EPIDEMIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Any other H course</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 29-30

* Baccalaureate Core Course (BCC)

Minor Code: 496

Public Health Undergraduate Major (BS, HBS)

Also available via Ecampus.

Public health is an exciting and diverse field for those interested in the health and well-being of populations and their environments. Careers in the public and private sectors offer opportunities to work locally, regionally, nationally, and internationally to promote health and prevent disease. Recognizing that multiple and complex factors affect the public's health, our faculty and students examine environmental issues, access to health care services, health policies, and social and contextual factors as determinants of health.

Students in this major will choose one of the following major options:

- Health Management and Policy
- Health Promotion and Health Behavior

Both options provide students with the prerequisites for graduate programs in public health.

For further information about undergraduate programs in public health, visit the website (https://health.oregonstate.edu/academics/public-health/)

The College of Public Health and Human Sciences is accredited by the Council on Education for Public Health (http://ceph.org/accredited/) (CEPH).

Major Code: 239

Health Management and Policy Option

This option is offered within the following major(s):

- Public Health - College of Public Health and Human Sciences (p. 931)

Also available via Ecampus.

The Health Management and Policy option provides training and skills in the management of public health and health care programs and agencies, and in the analysis of public health policies. The program is appropriate for those who want to manage health programs in a wide range of institutions, both public and private, and is particularly well-suited for students interested in the business aspects associated with the delivery and financing of health services. Students can also focus on administration in assisted living facilities, continuing care retirement centers and nursing homes, and receive a Certificate in Gerontology.

Option Code: 242

Only grades of C- or better in Public Health major coursework (including prerequisites) will be applied to Public Health major requirements (no S/U grades). Only two attempts at courses will be permitted and applied to the degree.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 250</td>
<td>INTRODUCTION TO HEALTH CARE MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>H 432</td>
<td>ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE</td>
<td>3</td>
</tr>
<tr>
<td>H 434</td>
<td>*HEALTH CARE LAW AND REGULATION</td>
<td>3</td>
</tr>
<tr>
<td>H 436</td>
<td>ADVANCED TOPICS IN HEALTH CARE MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>H 457</td>
<td>FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS</td>
<td>3</td>
</tr>
<tr>
<td>H 458</td>
<td>REIMBURSEMENT MECHANISMS</td>
<td>3</td>
</tr>
<tr>
<td>H 407</td>
<td>SEMINAR (Sect. 1, Pre-Internship)</td>
<td>2</td>
</tr>
<tr>
<td>H 410</td>
<td>INTERNSHIP</td>
<td>12</td>
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</table>

Required Supporting Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 215</td>
<td>FUNDAMENTALS OF ACCOUNTING</td>
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<tr>
<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
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<tr>
<td>BA 390</td>
<td>MARKETING</td>
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<td>CS 101</td>
<td>COMPUTERS: APPLICATIONS AND IMPLICATIONS</td>
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<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
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<tr>
<td>ECON 202</td>
<td>*INTRODUCTION TO MACROECONOMICS</td>
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<tr>
<td>MB 230</td>
<td>*INTRODUCTORY MICROBIOLOGY</td>
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<td>MGMT 453</td>
<td>HUMAN RESOURCES MANAGEMENT</td>
<td>4</td>
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<tr>
<td>MTH 245</td>
<td>*MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES</td>
<td>4</td>
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<tr>
<td>PHL 444/REL 444</td>
<td>*BIOMEDICAL ETHICS</td>
<td>4</td>
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</tbody>
</table>

Baccalaureate Core Course (BCC)
Health Promotion and Health Behavior Option

This option is offered within the following major(s):

- Public Health - College of Public Health and Human Sciences (p. 931)

Also available via Ecampus.

This option prepares students for many career opportunities in the areas of public health promotion, health behavior, and disease prevention. Students learn a variety of skills and strategies that will provide them with the necessary proficiencies to improve population health in diverse settings. The program focuses on the social and behavioral determinants of health and disease across the lifespan, with a particular emphasis on health disparities. Graduates are qualified to assist with the planning, implementing, and evaluation of programs that address health disparities and that are intended to improve the health of diverse populations.

Option Code: 241

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>H 310</td>
<td>HEALTH FIELD EXPERIENCES</td>
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<tr>
<td>H 349</td>
<td>or PEER HELPER SKILLS DEVELOPMENT</td>
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<td>H 376</td>
<td>EVIDENCE-BASED HEALTH PROMOTION</td>
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<tr>
<td>H 407</td>
<td>SEMINAR</td>
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<tr>
<td>H 410</td>
<td>INTERNSHIP</td>
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<tr>
<td>H 476</td>
<td>*PLANNING AND EVALUATING HEALTH PROMOTION</td>
<td>4</td>
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<td>PROGRAMS</td>
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</tbody>
</table>

Required Supporting Courses

- BI 101 *ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE 4
- or BI 102 *ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE 4
- or BI 103 *HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE 4
- ES 101 *INTRODUCTION TO ETHNIC STUDIES 3
- NUTR 225 GENERAL HUMAN NUTRITION 3
- or NUTR 240 HUMAN NUTRITION 3
- PSY 201 *GENERAL PSYCHOLOGY 3
- SOC 204 *INTRODUCTION TO SOCIOLOGY 3
- WR 222 *ENGLISH COMPOSITION 3

Total Hours 43

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

College of Science

The College of Science faculty and students pursue both curiosity-driven, fundamental research to better understand the broader world and use-inspired research to tackle some of the grand challenges of science, engineering, business and education.

128 Kidder Hall
Oregon State University
Corvallis, OR 97331-4608
Phone: 541-737-4811
Email: science@oregonstate.edu
Website: science.oregonstate.edu (http://www.science.oregonstate.edu)
Social media: @OSUScience (https://twitter.com/OSUScience/)

Student Services

Science Success Center
109 Kidder Hall
Oregon State University
Corvallis, OR 97331-4608
Phone: 541-737-3854
Website: https://www.science.oregonstate.edu/advising-and-student-services (https://www.science.oregonstate.edu/advising-and-student-services/)

Heather J. Arbuckle, Head Advisor, 541-737-4786, heather.arbuckle@oregonstate.edu
Melissa Lee, Transfer Advisor and Recruiter, 541-737-3522, melissa.lee@oregonstate.edu (http://catalog.oregonstate.eduMailto:melissa.lee@oregonstate.edu)
Cori Hall, Student Success Advisor, 541-737-3854, cori.hall@oregonstate.edu
Gabrielle James, Special Assistant, 541-737-3279, gabrielle.james@oregonstate.edu
Peer Advisors, 541-737-3854, sciencesuccess@oregonstate.edu

Administration

Roy Haggerty, Dean, roy.haggerty@oregonstate.edu
Henri Jansen, Associate Dean of Academic and Student Affairs, 541-737-9194, henri.jansen@oregonstate.edu
Douglas Keszler, Associate Dean of Research and Graduate Programs, 541-737-6736, doug.keszler@oregonstate.edu
Debbie Farris, Director of Communications and Marketing, 541-737-4862, debbie.farris@oregonstate.edu
Chris Larson, Director of Partnerships and Industrial Programs, 541-737-6574, chris.larson@oregonstate.edu

College of Science

We offer internationally recognized undergraduate and graduate programs across the life, physical, mathematical and computational sciences. Specifically, we offer courses of study in biology, biochemistry and biophysics, biochemistry and molecular biology, biohealth sciences, chemistry, microbiology, mathematics, physics, statistics and zoology. We also offer 12 pre-professional programs to prepare students for careers in healthcare or medical professions. Students have opportunities to make original discoveries through research while working alongside world-class scientists.

The College of Science is a nucleus of learning, societal engagement, achievement, and discovery. It offers students an inclusive, welcoming and intellectually stimulating environment to a diverse community.

Research and teaching in the College of Science are enhanced through OSU’s outstanding professional schools in engineering, oceanography,
agriculture, forestry and pharmacy. Science students can enrich their degrees with courses from these areas.

**Majors**

The majors of the College of Science are informally divided into these areas:

**COMPUTATIONAL AND MATHEMATICAL SCIENCES**
- Mathematics and Statistics (graduate only)

**Life Sciences**
- Biochemistry and Biophysics, Biochemistry and Molecular Biology, BioHealth Sciences, Biology, Microbiology, Molecular and Cellular Biology (graduate only), Zoology

**Physical Sciences**
- Chemistry and Physics

**Pre-professional Programs**
- BioHealth Sciences

**Double Degrees**

Undergraduates with majors in the College of Science can earn a second degree in education, innovation management, international studies, or sustainability. For more information, visit the College of Education, College of Business, International Programs or Department of Forest Ecosystems and Society sections of this catalog.

**Pre-Professional Programs**

The College of Science offers special programs in health-related fields to help students meet entrance requirements for professional schools in clinical laboratory science, dentistry, medicine, optometry, pharmacy, physical therapy, physician assistant, podiatry and veterinary medicine.

**Curricula in Science**

Curricula in science lead to the following degrees: Bachelor of Arts (BA), Bachelor of Science (BS), Master of Arts (MA), Master of Science (MS), Professional Science Master’s (PSM), and Doctor of Philosophy (Ph.D.). (See the Graduate School for advanced degree requirements.) The College also offers a Master of Arts in Interdisciplinary Studies (MAIS).

**Teacher Certification**

All professional teacher education is offered through the College of Education. The following majors in the College of Science are good options for students interested in teaching middle school and high school. The College of Science offers an education option in biology (pre-education), chemistry (chemistry education), mathematics (secondary teaching emphasis) and physics (physics education).

Certain mathematics courses (MTH 211, MTH 212, MTH 390) are highly recommended for students who plan to teach elementary or secondary mathematics. See the College of Education section of this catalog for admission to the teacher licensure programs.

**Summer Courses for Secondary School Science and Mathematics Teachers**

During summer session, the College of Science offers a number of courses designed for high school teachers of science and/or mathematics. For offerings and full descriptions, visit the OSU Summer Session (http://summer.oregonstate.edu/) website.

**Scholarships**

The College of Science offers many scholarships to incoming and current students (with at least 28 credits at OSU). To learn more or apply, visit our website (https://www.science.oregonstate.edu/scholarships/).

To graduate with a BS degree in the College of Science, undergraduate students must fulfill the following requirements:

- University Baccalaureate Core (48)
- College of Science Requirements (these credits can also fulfill part of the baccalaureate core requirements)
- Mathematical sciences (12)
- Physical, earth, and/or biological sciences (15) to include a two-term sequence (At least one term in biological science and one term in physical or earth science. Must include a two-term sequence in one of these sciences)
- Department requirements (see each department)

Some departments also grant a BA degree that requires a full year of a college-level (200-level or above) foreign language and at least 9 credits of College of Liberal Arts electives in addition to credits required for the baccalaureate core. See the department listings for specific requirements.

A minimum 2.00 GPA is required in College of Science majors and minors; (S/U grading is not allowed in science majors or minors).

The curricula are shown for each major; some substitutions can be made with department and college approval. Unless otherwise indicated, the conditions and credits for research, thesis, reading and conference, and seminar are to be arranged with the instructor involved.

**Chemistry**

The Department of Chemistry offers BS, BA, MS, MA, MAIS, and PhD degrees in Chemistry. The facilities, faculty, and curricular offerings in this department are approved by the American Chemical Society.

Chemistry provides a gateway to many professions. An undergraduate chemistry degree may serve as preparation for professional work in chemistry and related sciences; as a foundation to pursue applied fields including pharmaceutical chemistry, forensics, biotechnology, medicine, chemical processing, electronics, agricultural and food science, oceanography, marketing of scientific equipment or supplies, environmental sciences, and atmospheric science. It may also serve as a core for pre-professional students pursuing graduate work in pure or applied chemistry, and for those seeking positions as research chemists and technical experts in commercial laboratories and chemical industries, positions in local, state, and federal government facilities, and for postgraduate work leading to teaching positions in universities, colleges, community colleges, and high schools.

There are several degree programs available to undergraduate chemistry majors. All curricula involve general, organic, analytical, physical, and inorganic chemistry course work, plus two to three years of laboratory work in chemistry.

All chemistry majors take part or all of Experimental Chemistry, a six-term laboratory course sequence consisting of 22 project-style experiments. This program replaces the traditional separate divisional laboratory
courses in chemistry taught at many universities. Students in this Integrated Laboratory Program work on two to five projects per term, each of which includes components of synthesis, analysis, theory and report writing spanning all areas of modern chemistry. One goal of the program is to provide students intensive hands-on experience in modern chemical instrumentation and computers as a foundation for both graduate studies and employment in science after graduation.

Most chemistry majors take advantage of the opportunity to become involved in research projects in the department. Working with a research group is an exciting way to apply ideas and skills acquired in formal course work. Students work closely with a faculty member and research group to set up their projects. Undergraduates also have the opportunity to present their research as a poster at the annual departmental poster session entitled 'Chemistry in Action.' Scheduling research time is flexible but three hours of work per week are required per credit. Areas of research available are highly varied and include synthesis of new compounds and materials, development and applications of chemical instrumentation, laser spectroscopy, surface science, reaction mechanisms, design and synthesis of polymers and optical materials, environmental chemistry, bioanalytical methods, and nuclear chemistry. Research experience is helpful when considering graduate work in chemistry and provides valuable experience for entering the job market. Students may also obtain valuable experience and credits for internships.

Graduate Studies

The Department of Chemistry offers graduate work leading toward Master of Arts, Master of Science, and Doctor of Philosophy degrees in analytical chemistry, inorganic chemistry, nuclear and radiation chemistry, organic chemistry, physical chemistry, and solid state chemistry. The major emphasis of the PhD program is on research. A nonthesis master's degree is available. Most graduate students working on a thesis in chemistry are supported either as graduate teaching assistants or as graduate research assistants.

Undergraduate Programs

Major

- Chemistry (p. 943)
  
  **Track One Options:**
  - Advanced Biochemistry (p. 946)
  - Advanced Chemistry (p. 947)
  
  **Track Two Options**
  - Biochemistry (p. 947)
  - Business (p. 947)
  - Chemistry Education (p. 948)
  - Chemical Engineering (p. 948)
  - Environmental Chemistry (p. 949)
  - Forensic Science (p. 949)
  - Materials Science (p. 950)
  - Pre-Medicine (p. 950)

Minor

- Chemistry (p. 943)

Graduate Programs

Major

- Chemistry (p. 942)

Minor

- Chemistry (p. 943)

Michael M. Lerner, Head
153A Gilbert Hall
Oregon State University
Corvallis, OR 97331-4003
Phone: 541-737-2081
Email: michael.lerner@oregonstate.edu
Website: http://chemistry.oregonstate.edu/

Faculty

**Professors** Carter, Evans, Gable, Ingle, Keszler, Kong, Lerner, Loveland, Maier, Nibler, Nymawan, Remcho, Simonich, Subramanian, White

**Associate Professors** Beaudry, Blakemore, Cheong, Fang, Ji

**Assistant Professors** Koley, Loesgen, Stylianou

**Senior Instructors II** Haak, Myles, Nafshun, Pastorek, Walker

**Senior Instructors I** Barth, Gautschi (Cascades), Sleszynski, Weiss

**Instructors** Knutson, Siler, Wojcinski, Geddes (Cascades), Towne (Cascades)

**Professors of Practice** Giordan

Adjunct Faculty

Beckman, Cann, Field, Herman, Mahmud, McPhail, Mehl, Paulenova, Philmus, Qiu, Tate, Zabriskie

Chemistry

CH 101. CHEMISTRY IN YOUR WORLD. (3 Credits)
For students who need some additional preparation before enrolling in a general chemistry course. Explores the impact of chemistry on our everyday lives while acquiring the skills it takes to be successful in general chemistry.

**Prerequisites:** Math Placement - ALEKS with a score of 046 or MTH 095 (may be taken concurrently) with C- or better or MTH 103 (may be taken concurrently) with C- or better or MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or MTH 252 with C- or better or MTH 252H with C- or better

CH 110. *ROYGBIV: THE CHEMISTRY OF COLORS.* (4 Credits)
An introduction to the concepts of chemistry and the importance of these concepts in understanding color. Lec/lab.

**Attributes:** CPPS – Core, Pers, Physical Science

CH 121. GENERAL CHEMISTRY. (5 Credits)
A general chemistry sequence for students who have had no previous training in chemistry and for those whose college aptitude test scores indicate the need for a more elementary introduction to chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. Lec/lab/rec. (CH 122, CH 123 are Bacc Core Courses)

**Equivalent to:** CH 104
CH 122. *GENERAL CHEMISTRY. (5 Credits)
A general chemistry sequence intended for majors in fields other than
the physical sciences. Lec/lab/rec. (CH 122 and CH 123 are Bacc Core
courses.)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 121 with C- or better or (CH 201 with C- or better or
(CH 231 with C- or better or CH 231H with C- or better))

CH 123. *GENERAL CHEMISTRY. (5 Credits)
A general chemistry sequence intended for majors in fields other than
the physical sciences. (CH 122 and CH 123 are Bacc Core courses.) Lec/rec/ lab.
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 121 with D- or better or ((CH 232 with C- or better or
CH 232H with C- or better) and (CH 262 [C:] or CH 262H [C-] or CH 272
[C-]) or (CH 202 [C-] and CH 205 [C-]))

CH 124. GENERAL CHEMISTRY. (3 Credits)
A bridge course, allowing students who have taken one term of General
Chemistry (CH 121) to complete the equivalent of one full semester of
general chemistry. Entering students are expected to have a working
knowledge of high school algebra, logarithms, and scientific notation.
Lec/lab.
Prerequisites: CH 121 with D- or better

CH 125. GENERAL CHEMISTRY. (2 Credits)
A bridge course, allowing students who also take one term of General
Chemistry (CH 123) to complete the equivalent of one full semester of
General Chemistry. Entering students are expected to have a working
knowledge of high school algebra, logarithms, and scientific notation.
Lec/lab. Offered via Ecampus only.
Prerequisites: CH 121 with D- or better and CH 124 [D-]
Recommended: One semester of general chemistry at another institution

CH 130. GENERAL CHEMISTRY OF LIVING SYSTEMS. (4 Credits)
Introduction to organic chemistry and the chemistry of biological
systems. Organic nomenclature and fundamental reactions, emphasizing
topics such as amino acids, proteins, biochemical energy, and nucleic
acids (DNA and RNA). Intended as a terminal course in chemistry, not to
serve as a prerequisite to higher numbered chemistry courses. Lec/lab.
Does not count toward a chemistry minor.

CH 140. GENERAL, ORGANIC, AND BIOLOGICAL CHEMISTRY. (6 Credits)
An introduction to general, organic, and biological chemistry. Intended
as a terminal course in chemistry, not to serve as a prerequisite to higher
numbered chemistry courses. Offered via Ecampus only.
Recommended: Entering students should have a working knowledge of
high school algebra, logarithms, and scientific notation

CH 199. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 3 credits.

CH 201. CHEMISTRY FOR ENGINEERING MAJORS. (3 Credits)
A sequence of selected chemistry topics for pre-engineering students.
Lec.
Prerequisites: MTH 111 (may be taken concurrently) with D- or better
or MTH 112 (may be taken concurrently) with D- or better or MTH 251
(may be taken concurrently) with D- or better or MTH 251H (may be taken
concurrently) with D- or better or MTH 252 (may be taken concurrently)
with D- or better or MTH 252H (may be taken concurrently) with D-
or better or MTH 254 (may be taken concurrently) with D- or better
or MTH 254H (may be taken concurrently) with D- or better or Math
Placement - ALEKS with a score of 060

CH 202. CHEMISTRY FOR ENGINEERING MAJORS. (3 Credits)
A sequence of selected chemistry topics for pre-engineering students.
Lec.
Prerequisites: CH 121 with C- or better or CH 201 with C- or better or
CH 231 with C- or better or CH 231H with C- or better

CH 205. LABORATORY FOR CH 202. (1 Credit)
Three-hour weekly session for the development of laboratory skills in
general chemistry for engineers. Lec/lab.
Prerequisites: CH 202 (may be taken concurrently) with D- or better

CH 211. RECITATION FOR CHEMISTRY 201. (1 Credit)
80-minute weekly session for the development of problem-solving skills in
general chemistry for engineers. Rec.
Corequisites: CH 201

CH 212. RECITATION FOR CHEMISTRY 202. (1 Credit)
One-hour weekly session for the development of problem-solving skills in
general chemistry for engineers. Rec.
Corequisites: CH 202

CH 220. CAREERS IN CHEMISTRY. (1 Credit)
Course for chemistry majors that discusses strategies for success in the
study of chemistry and the varied career opportunities available. Topics
range from surviving freshman chemistry to choices of advanced classes,
study abroad opportunities, internships, getting into and succeeding
in graduate school, choices of chemical careers in academia, industry,
government, non-governmental organizations, and using chemistry as a
foundation for careers in other areas such as law and business. Graded
P/N.

CH 231. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences,
pharmacy, and chemical engineering. CH 231 is a lecture course; CH 261
is the laboratory component. Lec/rec. (Bacc Core Course if taken with
CH 261)
Attributes: CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: MTH 111 (may be taken concurrently) with C- or better
or MTH 112 (may be taken concurrently) with C- or better or MTH 251
(may be taken concurrently) with C- or better or MTH 251H (may be taken
concurrently) with C- or better or MTH 252 (may be taken concurrently)
with C- or better or MTH 252H (may be taken concurrently) with C-
or better or MTH 254 (may be taken concurrently) with C- or better or MTH
254H (may be taken concurrently) with C- or better or Math
Placement - ALEKS with a score of 060
Equivalent to: CH 221, CH 221H, CH 224H, CH 231H

CH 231H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences,
pharmacy, and chemical engineering. CH 231H is a lecture course;
CH 261H is the laboratory component. Lec/rec. (Bacc Core Course if
taken with CH 261H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors
Course Designator
Prerequisites: MTH 111 (may be taken concurrently) with C- or better
or MTH 112 (may be taken concurrently) with C- or better or MTH 251
(may be taken concurrently) with C- or better or MTH 251H (may be taken
concurrently) with C- or better or MTH 252 (may be taken concurrently)
with C- or better or MTH 252H (may be taken concurrently) with C-
or better or MTH 254 (may be taken concurrently) with C- or better or MTH
254H (may be taken concurrently) with C- or better or Math
Placement - ALEKS with a score of 060
Equivalent to: CH 231
**CH 232. GENERAL CHEMISTRY. (4 Credits)**
A general chemistry sequence for students majoring in most sciences, pre-pharmacy, and chemical engineering. CH 232 is a lecture course; CH 262 is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 262)

Attributes: CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: (CH 231 with C- or better or CH 231H with C- or better) or CH 221 with C- or better
Equivalent to: CH 222, CH 225H, CH 232H

**CH 232H. GENERAL CHEMISTRY. (4 Credits)**
A general chemistry sequence for students majoring in most sciences, pre-pharmacy, and chemical engineering. CH 232H is a lecture course; CH 262H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 262H)

Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: (CH 231 with C- or better or CH 231H with C- or better) or CH 221 with C- or better
Equivalent to: CH 232

**CH 233. GENERAL CHEMISTRY. (4 Credits)**
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 233 is a lecture course; CH 263 is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 263)

Attributes: CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: (CH 232 with C- or better or CH 232H with C- or better) or CH 222 with C- or better
Equivalent to: CH 223, CH 226H, CH 233H

**CH 233H. GENERAL CHEMISTRY. (4 Credits)**
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 233H is a lecture course; CH 263H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 263H)

Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: (CH 232 with C- or better or CH 232H with C- or better) or CH 222 with C- or better
Equivalent to: CH 233

**CH 261. *LABORATORY FOR CHEMISTRY 231. (1 Credit)**
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 231)

Attributes: CPPS – Core, Pers, Physical Science
Corequisites: CH 231
Equivalent to: CH 261H, CH 271

**CH 261H. *LABORATORY FOR CHEMISTRY 231H. (1 Credit)**
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 231H)

Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Corequisites: CH 231H
Equivalent to: CH 261

**CH 262. *LABORATORY FOR CHEMISTRY 232. (1 Credit)**
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 232)

Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 261 with D- or better or CH 261H with D- or better or CH 271 with D- or better or CH 221 with D- or better or CH 224H with D- or better
Corequisites: CH 232
Equivalent to: CH 262H, CH 272

**CH 262H. *LABORATORY FOR CHEMISTRY 232H. (1 Credit)**
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 232H)

Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: CH 261 with D- or better or CH 261H with D- or better or CH 271 with D- or better or CH 221 with D- or better or CH 224H with D- or better
Corequisites: CH 232H
Equivalent to: CH 262

**CH 263. *LABORATORY FOR CHEMISTRY 233. (1 Credit)**
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 233)

Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233H
Equivalent to: CH 263H, CH 273

**CH 263H. *LABORATORY FOR CHEMISTRY 233H. (1 Credit)**
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 233H)

Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233H
Equivalent to: CH 263

**CH 271. *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS. (1 Credit)**
A general chemistry laboratory sequence for students majoring in chemistry. (Bacc Core Course if taken with CH 231)

Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 231
Equivalent to: CH 271H

**CH 272. *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS. (1 Credit)**
A general chemistry laboratory sequence for students majoring in chemistry. (Bacc Core Course if taken with CH 232)

Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 271 with D- or better or CH 221 with D- or better or CH 224H with D- or better
Corequisites: CH 232
Equivalent to: CH 272H
CH 273. *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS. (1 Credit)
A general chemistry laboratory sequence for students majoring in chemistry. (Bacc Core Course if taken with CH 233)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233
Equivalent to: CH 273H

CH 324. QUANTITATIVE ANALYSIS. (4 Credits)
A basic course in modern chemical analysis. Self-paced laboratory. CH 130 does not meet the prerequisites for this course.
Prerequisites: CH 123 with D- or better or CH 223 with D- or better or CH 226H with D- or better or ((CH 233 with D- or better or CH 233H with D- or better) and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-]))
Recommended: One year of general chemistry

CH 331. ORGANIC CHEMISTRY. (4 Credits)
Service course covering aliphatic and aromatic chemistry. Introduction to nomenclature, mechanism and synthesis. Lec/rec. CH 130 does not meet the prerequisites for this course.
Prerequisites: CH 123 with C- or better or CH 223 with C- or better or CH 226H with C- or better or ((CH 233 with C- or better or CH 233H with C- or better) and (CH 263 [C-] or CH 263H [C-] or CH 273 [C-]))
Recommended: One year of general chemistry

CH 332. ORGANIC CHEMISTRY. (4 Credits)
Service course covering aliphatic and aromatic chemistry. Introduction to nomenclature, mechanism and synthesis. Lec/rec.
Prerequisites: CH 331 with C- or better
Recommended: one year of general chemistry.

CH 334. ORGANIC CHEMISTRY. (3 Credits)
Professional course for majors in chemistry, biochemistry, chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches.
Prerequisites: CH 123 with D- or better or CH 223 with D- or better or CH 226H with D- or better or ((CH 233 with D- or better or CH 233H with D- or better) and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-]))
Recommended: One year of general chemistry

CH 335. ORGANIC CHEMISTRY. (3 Credits)
Professional course for majors in chemistry, biochemistry, chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches.
Prerequisites: CH 334 with D- or better
Recommended: One year of general chemistry

CH 336. ORGANIC CHEMISTRY. (3 Credits)
Professional course for majors in chemistry, biochemistry, chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches.
Prerequisites: CH 335 with D- or better
Recommended: One year of general chemistry

CH 337. ORGANIC CHEMISTRY LABORATORY. (4 Credits)
Laboratory course in organic chemistry for nonmajors, designed to supplement CH 331, CH 332 and CH 334, CH 335, CH 336. Lec/lab.
Prerequisites: (CH 331 with D- or better and CH 332 [D-]) or (CH 334 [D-] and CH 335 [D-] and CH 336 [D-])

CH 361. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First term of integrated laboratory program for chemistry majors highlighting techniques in organic, physical, and analytical chemistry. First-hand experience is gained using specialized glassware, scientific equipment and instrumentation plus computers. Essential technical laboratory standards and technical writing are emphasized. Lec/lab.
Prerequisites: ((CH 221 with D- or better and CH 222 [D-] and CH 223 [D-]) or (CH 224H [D-] and CH 225H [D-] and CH 226H [D-]) or ((CH 231 [D-] or CH 231H [D-] and (CH 261 [D-] or CH 261H [D-] or CH 271 [D-]) and (CH 232 [D-] or CH 232H [D-] and (CH 262 [D-] or CH 262H [D-] or CH 272 [D-] and (CH 233 [D-] or CH 233H [D-] and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-])) and (MT 251 (may be taken concurrently) [D-] or MTH 251H (may be taken concurrently) [D-]) and (MT 251H (may be taken concurrently) [D-] and (PH 201 (may be taken concurrently) [D-] or PH 211 (may be taken concurrently) [D-]) and CH 334 (may be taken concurrently) [D-])
Equivalent to: CH 361H

CH 361H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First term of integrated laboratory program for chemistry majors highlighting techniques in organic, physical, and analytical chemistry. First-hand experience is gained using specialized glassware, scientific equipment and instrumentation plus computers. Essential technical laboratory standards and technical writing are emphasized. Lec/lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((CH 221 with D- or better and CH 222 [D-] and CH 223 [D-]) or (CH 224H [D-] and CH 225H [D-] and CH 226H [D-]) or ((CH 231 [D-] or CH 231H [D-] and (CH 261 [D-] or CH 261H [D-] or CH 271 [D-]) and (CH 232 [D-] or CH 232H [D-] and (CH 262 [D-] or CH 262H [D-] or CH 272 [D-] and (CH 233 [D-] or CH 233H [D-] and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-])) and (MT 251 (may be taken concurrently) [D-] or MTH 251H (may be taken concurrently) [D-] and (PH 201 (may be taken concurrently) [D-] or PH 211 (may be taken concurrently) [D-]) and CH 334 (may be taken concurrently) [D-])
Equivalent to: CH 361

CH 362. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab.
Prerequisites: (CH 361 with D- or better or CH 361H with D- or better) and CH 335 (may be taken concurrently) [D-]
Equivalent to: CH 362H

CH 362H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: (CH 361 with D- or better or CH 361H with D- or better) and CH 335 (may be taken concurrently) [D-]
Equivalent to: CH 362

CH 374. *TECHNOLOGY, ENERGY, AND RISK. (3 Credits)
Decision-making in a technical, democratic society. Discussion of current issues such as acid rain, toxic organic chemicals in the environment, energy resources, etc. Does not meet the prereq for any other chemistry course. Does not meet requirements for chemistry minor. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Completion of Bacc Core in physical science
CH 390. ENVIRONMENTAL CHEMISTRY. (3 Credits)
Sources, reactions, transport, effects, and fates of chemical species in water, soil, air, and living environments and the effects of technology thereon.
Prerequisites: CH 331 with D- or better or CH 334 with D- or better
CH 399. SPECIAL TOPICS. (1-16 Credits)
Discussion of special topics in chemistry.
This course is repeatable for 99 credits.
Recommended: Completion of Bacc Core in the physical sciences
CH 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
CH 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.
CH 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
CH 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
CH 407. SEMINAR. (1-16 Credits)
Equivalent to: CH 407H
This course is repeatable for 16 credits.
CH 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CH 407
This course is repeatable for 16 credits.
CH 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
CH 411. INORGANIC CHEMISTRY. (3 Credits)
Fundamental principles of inorganic chemistry including atomic structure, bonding models for molecules and solids, symmetry, acid/base chemistry, oxidation-reduction, and metal-ligand complexes.
Recommended: One year of general chemistry and college-level physics
CH 411H. INORGANIC CHEMISTRY. (3 Credits)
Descriptive chemistry of the elements, focusing on main-group compounds, transition metal complexes, and solid-state chemistry.
Prerequisites: CH 411 with D- or better
CH 418. NUCLEAR CHEMISTRY. (3 Credits)
Radioactive decay, nuclear properties, nuclear structure, alpha, beta, and gamma decay, nuclear reactions, fission, interaction of radiation with matter, chemical techniques, radiation safety, and nuclear instrumentation.
Recommended: Concurrent enrollment in (CH 440 or CH 540) or PH 314
CH 421. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, instrumentation, and treatment of data.
Recommended: One year of general chemistry and one year of college physics. Concurrent enrollment in CH 440 or CH 540
CH 422. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, basic electronics and instrumentation, and treatment of data.
Recommended: One year of general chemistry and one year of college physics. Concurrent enrollment in CH 441 or CH 541
CH 424. BIOANALYTICAL CHEMISTRY. (3 Credits)
Analytical methods employed in the study of biologically important molecules. Separations (chromatography, electrophoresis), spectroscopy, mass spectrometry, biosensors, and immunoassays. Lec/lab. Not offered every year.
Recommended: One year of organic chemistry and one term of organic chemistry laboratory.
CH 435. STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS. (3 Credits)
Use of ultraviolet, infrared, nuclear magnetic resonance, and mass spectra for determination of structures and stereochemistry of complex organic molecules.
Prerequisites: CH 336 with D- or better and (CH 442 [D-] or CH 542 [D-])
CH 440. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Prerequisites: MTH 254 with D- or better or MTH 254H with D- or better
Recommended: One year of general chemistry and one year of college physics
CH 441. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Prerequisites: (CH 440 with C- or better or CHE 311 with C- or better) and (MTH 254 [C-] or MTH 254H [C-])
CH 442. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and CH 441 [D-]
Recommended: One year of general chemistry and one year of college physics
CH 450. INTRODUCTORY QUANTUM CHEMISTRY. (3 Credits)
Elementary wave mechanics and matrix mechanics of atoms and molecules. Quantum basis of chemical structure. Not offered every year.
Prerequisites: CH 442 with D- or better or CH 542 with D- or better
Recommended: One year college physics
CH 461. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab.
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 421 (may be taken concurrently) [D-] and CH 440 (may be taken concurrently) [D-]
Equivalent to: CH 461H
CH 461H. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic and physical chemistry. Lec/Lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 421 (may be taken concurrently) [D-] and CH 440 (may be taken concurrently) [D-]
Equivalent to: CH 461
CH 462. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 441 (may be taken concurrently) [D-] and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-])
Equivalent to: CH 462H
Recommended: CH 422

CH 462H. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 441 (may be taken concurrently) [D-] and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-])
Equivalent to: CH 462
Recommended: CH 422

CH 463. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-]) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 463H

CH 463H. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-]) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 463

CH 464. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 464H
Recommended: CH 461 or CH 461H or CH 324

CH 464H. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 442 (may be taken concurrently) [D-]

Equivalent to: CH 464
Recommended: CH 461 or CH 461H or CH 324

CH 471. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Principles of synthetic organic chemistry. Particular emphasis will be directed at understanding stereochemical outcomes in carbon-carbon bond-forming reactions (Diels-Alder, aldol, and pericyclic reactions). Other topics will include oxidation/reduction reactions, organometallic chemistry, and enantioselective methodologies.
Prerequisites: CH 336 with D- or better or CH 337 with D- or better

CH 490. COMPUTER PROGRAMMING FOR SCIENTISTS. (3 Credits)
Programming, numerical and graphical analysis, problem solving, simulations and use of databases for information handling and retrieval. Applications to problems in chemistry.
Prerequisites: MTH 252 with D- or better or MTH 252H with D- or better

CH 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

CH 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CH 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CH 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CH 507. SEMINAR. (1-16 Credits)
Student should enroll in the seminar section that meets the specific divisional requirements for credits and grading scheme or that is designated for teaching or mentoring programs. Graded P/N.
This course is repeatable for 16 credits.

CH 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CH 511. INORGANIC CHEMISTRY. (4 Credits)
Fundamental principles of inorganic chemistry including atomic structure, bonding models for molecules and solids, symmetry, acid/base chemistry, oxidation-reduction, metal-ligand complexes, sol-gel chemistry and nanochemistry.
Recommended: CH 442 or CH 542

CH 512. INORGANIC CHEMISTRY. (4 Credits)
Descriptive chemistry of the elements, focusing on main-group compounds, transition metal complexes, and solid-state chemistry.
Prerequisites: CH 511 with C or better

CH 513. SOLID STATE CHEMISTRY. (3-4 Credits)
Basic principles of chemistry are applied to descriptions of structure-property relationships in inorganic solids. Topics include crystal structure, materials synthesis, chemical bonding, electronic properties, optical properties, and magnetism. Students who register for 4 credits will perform independent study of an advanced topic based on research literature.
This course is repeatable for 4 credits.
Recommended: CH 442 or CH 542
CH 516. RADIOCHEMISTRY. (4 Credits)
Selected methods in radiochemical analysis. Actinide chemistry, activation analysis, radionuclide solvent extraction, and microbial reactions with radionuclides. Designed for majors in chemistry, chemical engineering, nuclear engineering, and radiation health physics. Lec/lab. CROSSLISTED as CH 516/NSE 516.
Prerequisites: NE 531 with C or better or (RHP 531 with C or better and RHP 536 [C])
Equivalent to: CHE 516, NE 516, NSE 516, RHP 516
This course is repeatable for 12 credits.

CH 518. NUCLEAR CHEMISTRY. (3 Credits)
Radioactive decay, nuclear properties, nuclear structure, alpha, beta, and gamma decay, nuclear reactions, fission, interaction of radiation with matter, chemical techniques, radiation safety, and nuclear instrumentation.
Recommended: Concurrent enrollment in (CH 440 or CH 540) or PH 314

CH 521. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, instrumentation, and treatment of data.
Recommended: One year of college chemistry and physics. Concurrent enrollment in CH 540

CH 522. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, basic electronics and instrumentation, and treatment of data.
Recommended: One year of college chemistry and physics. Concurrent enrollment in CH 541

CH 524. BIOANALYTICAL CHEMISTRY. (3 Credits)
Analytical methods employed in the study of biologically important molecules. Separations (chromatography, electrophoresis), spectroscopy, mass spectrometry, biosensors, and immunoassays. Lec/lab. Not offered every year.
Equivalent to: VM 524, VMB 524
Recommended: One year of organic chemistry and one term of organic chemistry laboratory.

CH 535. STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS. (3 Credits)
Use of ultraviolet, infrared, nuclear magnetic resonance, and mass spectra for determination of structures and stereochemistry of complex organic molecules.
Recommended: CH 336 and (CH 442 or CH 542)

CH 540. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Recommended: MTH 254 and one year of college chemistry and one year of college physics

CH 541. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Recommended: (CH 440 or CHE 311) AND (MTH 254 or MTH 254H)

CH 542. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Recommended: CH 541

CH 550. INTRODUCTORY QUANTUM CHEMISTRY. (3 Credits)
Elementary wave mechanics and matrix mechanics of atoms and molecules. Quantum basis of chemical structure. Not offered every year.
Prerequisites: CH 542 with C or better
Recommended: One year college physics

CH 553. CHEMICAL THERMODYNAMICS. (3 Credits)
The laws of chemical thermodynamics applied to analyze properties of gases, gas mixtures, liquid solutions, fluctuations, critical phenomena, and magnetic systems. Not offered every year.
Recommended: CH 542

CH 571. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Principles of synthetic organic chemistry. Particular emphasis will be directed at understanding stereochemical outcomes in carbon-carbon bond-forming reactions (Diels-Alder, aldol, and pericyclic reactions). Other topics will include oxidation/reduction reactions, organometallic chemistry, and enantioselective methodologies.
Recommended: CH 336 or CH 337

CH 582. CHEMISTRY AND MATERIALS OF BATTERIES AND SUPERCAPACITORS. (3 Credits)
Examines the chemistry and materials currently in use and proposed for future primary and secondary batteries and supercapacitors. After a brief historical review, we will examine in detail the state-of-the-art technologies including lithium-ion, lithium, and sodium-sulfur batteries and electrochemical double-layer capacitors, and future technologies such as metal-air and lithium-sulfur. Class discussions will focus on structure/performance relationships and other issues such as environmental impact, safety and cost. Offered via Ecampus only.
Recommended: Full year of general chemistry, college-level physics and materials science background

CH 584. INSTRUMENTS AND ONLINE INTERACTIONS IN THE SCIENCES. (3 Credits)
Examine methods and technologies for and incorporating virtual instruments and online interactions into laboratory courses to support learners in becoming critical thinkers and creative producers of their knowledge and understanding in science.
Recommended: Basic computer literacy and one year of general chemistry, physics or biology

CH 590. COMPUTER PROGRAMMING FOR SCIENTISTS. (3 Credits)
Programming, numerical and graphical analysis, problem solving, simulations and use of databases for information handling and retrieval. Applications to problems in chemistry.
Recommended: MTH 252

CH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CH 603. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

CH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CH 607. SEMINAR. (1-16 Credits)
Student should enroll in the seminar section that meets the specific divisional requirements for credits and grading scheme or that is designated for teaching or mentoring programs.
This course is repeatable for 16 credits.
CH 614. SELECTED TOPICS IN INORGANIC CHEMISTRY. (4 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in fields such as solid state chemistry, theoretical inorganic chemistry, spectroscopy and magnetism, chemistry of coordination compounds, kinetics and mechanisms of inorganic reactions, acid-base theory and reactions in nonaqueous solvents, organometallic chemistry, and chemistry of the less familiar elements. Not offered every year.
Equivalent to: CH 514
This course is repeatable for 8 credits.
Recommended: CH 413 or CH 513

CH 615. SELECTED TOPICS INORGANIC CHEMISTRY. (4 Credits)
Focus is on cutting edge research topics in inorganic materials chemistry, which will evolve from year-to-year to stay up-to-date. Current journal articles, software programs, and lab demonstrations will be utilized. Students will learn both content of a research area, as well as tools used in the practice.

CH 616. CRYSTALLOGRAPHY AND X-RAY DIFFRACTION. (4 Credits)
Principles of crystallography and x-ray diffraction as applied to the structural characterization of both single crystals, powders, and thin films.
Equivalent to: CH 516
Recommended: At least one upper-level undergraduate inorganic chemistry course

CH 630. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Molecular orbital bonding theory, orbital symmetry, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. Not offered every year.
Equivalent to: CH 530
Recommended: CH 336 and (CH 442 or CH 542)

CH 631. ADVANCED ORGANIC CHEMISTRY. (4 Credits)
Carbon-carbon bond forming reactions, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. Not offered every year.
Equivalent to: CH 531
Recommended: CH 630

CH 632. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Molecular orbital bonding theory, orbital symmetry, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. Not offered every year.
Equivalent to: CH 532
Recommended: CH 336 and (CH 442 or CH 542)

CH 633. HYPOTHESIS, EVIDENCE, AND ARGUMENT IN ORGANIC CHEMISTRY. (2 Credits)
Immerses the student in the tools of scientific method as applied to current research topics in the chemical literature. The student will perform an extensive review of a modern topic in organic chemistry, prepare a written summary and analysis of this literature review and make a public oral presentation and discussion.
Prerequisites: CH 632 with C or better
This course is repeatable for 4 credits.

CH 636. SELECTED TOPICS IN ORGANIC CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with recent advances in organic chemistry and their application to special fields of study. Topics covered vary from term to term and year to year. Topics include: theoretical organic chemistry, recent advances in reaction mechanisms, advanced synthesis, free radical reactions, organic sulfur chemistry, and biosynthesis of natural products. CH 636, CH 637, CH 638 need not be taken in order. Not offered every year.
Equivalent to: CH 536
This course is repeatable for 12 credits.

CH 637. SELECTED TOPICS IN ORGANIC CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with advances in organic chemistry, specifically focusing on biosynthesis of natural products and enzyme reaction mechanisms. CH 636, CH 637, CH 638 need not be taken in order.
Equivalent to: CH 537
This course is repeatable for 12 credits.

CH 638. SELECTED TOPICS IN ORGANIC CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with recent advances in organic chemistry and their application to special fields of study. Topics covered vary from term to term and year to year. Topics include: theoretical organic chemistry, recent advances in reaction mechanisms, advanced synthesis, free radical reactions, organic sulfur chemistry, and biosynthesis of natural products. CH 636, CH 637, CH 638 need not be taken in order. Not offered every year.
Equivalent to: CH 538
This course is repeatable for 12 credits.

CH 651. QUANTUM MECHANICS OF ATOMS AND MOLECULES. (3 Credits)
Not offered every year.
Equivalent to: CH 551
Recommended: CH 450 or CH 550

CH 652. QUANTUM MECHANICS OF MOLECULAR SPECTROSCOPY. (3 Credits)
Not offered every year.
Equivalent to: CH 552
Recommended: CH 651

CH 660. SPECTROCHEMICAL ANALYSIS. (3 Credits)
Theoretical concepts and methodology of optical spectrochemical methods of analysis, components of spectrometers, flame and electrothermal atomic spectrophotometry, ICP atomic emission spectrometry, molecular absorption and fluorescence spectrometry.
Equivalent to: CH 560
Recommended: CH 442 or CH 542

CH 661. SEPARATIONS: CHROMATOGRAPHY AND RELATED METHODS. (4 Credits)
Theory, instrumentation, and practice of modern separation techniques (gas chromatography, liquid chromatography, electrokinetic separations) and sample preparation methods; handling and interpretation of chromatographic and electrophoretic data.
Equivalent to: CH 561
Recommended: CH 440 or CH 540

CH 662. ANALYTICAL ELECTROCHEMISTRY. (4 Credits)
Study of current, voltage and time relationships in electrochemical cells. Offered alternate years.
Equivalent to: CH 562
Recommended: CH 442
CH 680. SELECTED TOPICS IN PHYSICAL CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with recent advances in physical chemistry. Topics include molecular structure dynamics determination (UV-visible, near-IR light sources, x-ray, electron and neutron diffraction), spectroscopy (ultrafast, nonlinear, multidimensional, multiphoton, magnetic resonance, photoelectron), physical chemistry of condensed phase systems (biomolecules, aqueous solution, novel materials, ionic, molecular and liquid crystals, critical phenomena, mass transport), theoretical chemistry (chemical bonding, scattering theory, group theory, dynamics), electronic structure theory of molecules, structural dynamics of complex systems. Need not be taken in order. Not offered every year.
Prerequisites: CH 550 with B- or better
Equivalent to: CH 580
This course is repeatable for 12 credits.

CH 681. SELECTED TOPICS IN PHYSICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint students with recent advances in physical chemistry. Topics include molecular structure determination (x-ray, electron and neutron diffraction), spectroscopy (nonlinear and multiphoton, magnetic resonance, photoelectron, Moessbauer effect), physical chemistry of condensed phases (ionic, molecular and liquid crystals, critical phenomena, mass transport), theoretical chemistry (chemical bonding, scattering theory, group theory, dynamics), electronic structure theory of molecules. Need not be taken in order. Not offered every year.
Equivalent to: CH 581
This course is repeatable for 12 credits.

CH 682. SELECTED TOPICS IN PHYSICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint students with recent advances in physical chemistry. Topics include molecular structure determination (x-ray, electron and neutron diffraction), spectroscopy (nonlinear and multiphoton, magnetic resonance, photoelectron, Moessbauer effect), physical chemistry of condensed phases (ionic, molecular and liquid crystals, critical phenomena, mass transport), theoretical chemistry (chemical bonding, scattering theory, group theory, dynamics), electronic structure theory of molecules. Need not be taken in order. Not offered every year.
Equivalent to: CH 582
This course is repeatable for 12 credits.

CH 683. SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. Not offered every year.
Equivalent to: CH 583
This course is repeatable for 12 credits.

CH 684. SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. Not offered every year.
Equivalent to: CH 584
This course is repeatable for 12 credits.

CH 685. SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. Not offered every year.
Equivalent to: CH 585
This course is repeatable for 12 credits.

CH 686. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. Not offered every year.
Equivalent to: CH 586
This course is repeatable for 12 credits.

CH 687. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. Not offered every year.
Equivalent to: CH 587
This course is repeatable for 12 credits.

CH 688. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. Not offered every year.
Equivalent to: CH 588
This course is repeatable for 12 credits.

CH 692. ENVIRONMENTAL TRANSFORMATION OF ORGANIC COMPOUNDS. (3 Credits)
Chemical, photochemical, and biological transformation reactions of organic compounds in the environment. Test methods and predictive models for determining the persistence of organic compounds in the environment. Offered alternate years.
Recommended: CH 336 and CH 440

CH 697. MASS SPECTROMETRY OF ORGANIC COMPOUNDS. (4 Credits)
Physical principles of mass spectrometric instrumentation and interpretation of the mass spectra of organic compounds and biomolecules. Not offered every year.
Equivalent to: TOX 637

Chemistry Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Analytical chemistry, inorganic chemistry, materials chemistry, nuclear chemistry, organic chemistry, physical chemistry

The Department of Chemistry offers graduate work leading toward Master of Arts, Master of Science, and Doctor of Philosophy degrees in Chemistry with concentrations in analytical chemistry, inorganic chemistry, nuclear chemistry, organic chemistry, physical chemistry and solid state chemistry.

All students are required, early in their graduate study, to take a series of graduate courses in their major area. For the PhD, the required written preliminary examinations take the form of a number of 'cumulative examinations.' Exceptions to this include the concentration in nuclear chemistry, which requires only a single written examination, and concentrations in inorganic chemistry, solid state chemistry or physical chemistry, which require only an oral exam. For each field, there is a list of courses representing subject matter in which competence is required of those electing that field for PhD work, but the major emphasis of the PhD program is on research rather than formal courses. All degrees require a research thesis except for the Master of Science nontesis degree. There is no departmental requirement of a foreign language. Most
graduate students in chemistry are supported either as graduate teaching assistants or as graduate research assistants.

Major Code: 5200

Major Code: 5200

Chemistry Graduate Minor

Minor Code: 5200

Minor Code: 5200

Chemistry Minor

Also available at OSU-Cascades and via Ecampus.

See the Chemistry website (http://chemistry.oregonstate.edu/node/1727/) for more details about the Chemistry minor.

Minor Code: 520

The requirements for a minor in Chemistry include a minimum of 27 credits of chemistry (CH) courses.

All courses must be taken for a grade (not S/U) and the overall GPA for all chemistry courses must be 2.0 or higher.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>CH 374</td>
<td>*TECHNOLOGY, ENERGY, AND RISK</td>
<td>3</td>
</tr>
<tr>
<td>CH 401/CH 501/CH 601</td>
<td>RESEARCH</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 403/CH 503/CH 603</td>
<td>THESIS</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 407/CH 507/CH 607</td>
<td>SEMINAR</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 410/CH 510</td>
<td>INTERNSHIP</td>
<td>1-16</td>
</tr>
</tbody>
</table>

Courses that cannot be used for the minor:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 130</td>
<td>GENERAL CHEMISTRY OF LIVING SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>CH 374</td>
<td>*TECHNOLOGY, ENERGY, AND RISK</td>
<td>3</td>
</tr>
<tr>
<td>CH 401/CH 501/CH 601</td>
<td>RESEARCH</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 403/CH 503/CH 603</td>
<td>THESIS</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 407/CH 507/CH 607</td>
<td>SEMINAR</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 410/CH 510</td>
<td>INTERNSHIP</td>
<td>1-16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>12</td>
</tr>
</tbody>
</table>

Total Hours: 24-27

Chemistry Undergraduate Major (BA, BS, HBA, HBS)

BS Degree in Chemistry

The BS degree in Chemistry features two tracks, each with a chemistry core and a selection of accompanying options. Students in either track or any option with good academic records and letters of recommendation will be well prepared and competitive for continued graduate education in chemistry or related areas.

- **Track One** is well suited for students intending to pursue a graduate degree in chemistry or a closely related area. It provides the most rigorous and complete chemistry background and the most extensive laboratory experience. The curriculum is approved by the American Chemical Society (ACS) and has two options: advanced biochemistry and advanced chemistry. Both options include 6–12 credits of career-supportive electives (CSE) in advanced chemistry or related disciplines. These CSE courses are approved by the advisor and are intended to strengthen the student's background in areas related to career goals. Students choosing the advanced chemistry option must take at least 3 credits in advanced laboratory courses or research. Track-One graduates are eligible for ACS certification by the department chair and can become full members of the ACS without the requirement of work experience.

- **Track Two** is suited for chemistry majors who want to gain extensive experience in a secondary area, target a particular career direction or continue with graduate education in chemistry or related areas. **Track Two options include biochemistry, business, chemistry education, chemical engineering, environmental chemistry, forensic science, materials science, and pre-medicine.** The multidisciplinary approach of Track Two enhances preparation and opportunities for employment in electronics, polymers, or biotechnology (the biochemistry, chemical engineering, or materials science options), for careers in environmental science (environmental chemistry option), work in crime labs (forensic science option), or teaching in high schools (chemistry education option). The Track Two curriculum is not approved by the American Chemical Society. It consists of a core of chemistry courses (79–81 credits) and a combination of 8 to 11 courses (30–37 credits) that defines each option.

BA Degree in Chemistry

The BA degree in Chemistry is appropriate for chemistry students interested in obtaining a broader academic background through a second-language requirement and additional liberal arts courses (9 credits). It also includes 6–12 credits of approved career-supportive electives to allow students to choose courses in advanced chemistry or related disciplines to support their career goals. At least 3 credits are to be in advanced laboratory courses or research. This degree may lead to international opportunities, especially if coupled with the International Degree Program at OSU.

Major Code: 520
All Undergraduate Chemistry Degrees
Completion of an option is required to earn a degree in Chemistry.

The baccalaureate core requirements are met by:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
</tr>
<tr>
<td>Speech</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Writing courses</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Perspectives courses</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>One Biology course</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>One Difference, Power, and Discrimination course (DPO)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Synthesis courses</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>37-38</td>
</tr>
</tbody>
</table>

The quarters in which these are taken are flexible, except that synthesis courses must be taken at the junior and senior level. Chemistry majors or minors may not use S/U grading in courses that meet Department of Chemistry or College of Science requirements.

The timing of courses for all degrees and options can be critical, especially because of prerequisites. More detailed information and suggestions about when to take courses are found on the Chemistry Department website at http://chemistry.oregonstate.edu/. Students should meet with their advisor every term. For many options in Track Two, students will also be directed to an additional advisor in another department for courses in that option.

For any option involving biochemistry courses, it is strongly recommended that students select:

BB 314, is also recommended. Prereqs for BB 314 are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>CH 334</td>
<td>ORGANIC CHEMISTRY</td>
<td>3</td>
</tr>
</tbody>
</table>

BI 212 as the biology course to fulfill the baccalaureate core requirement.

For options in which CH 462 is the recommended WIC course, it is strongly recommended that CH 422 be taken as a corequisite.

Chemistry offers the following courses through the Honors College (HC). Chemistry students in the HC may substitute these courses for courses in the regular sequences:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231 H</td>
<td>GENERAL CHEMISTRY</td>
<td>12</td>
</tr>
<tr>
<td>&amp; CH 271 H</td>
<td>and *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 232 H</td>
<td>and GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 233 H</td>
<td>and GENERAL CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 261 H</td>
<td>*LABORATORY FOR CHEMISTRY 231H</td>
<td>3</td>
</tr>
<tr>
<td>&amp; CH 262 H</td>
<td>and *LABORATORY FOR CHEMISTRY 232H</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 263 H</td>
<td>and *LABORATORY FOR CHEMISTRY 233H</td>
<td></td>
</tr>
<tr>
<td>CH 361 H</td>
<td>EXPERIMENTAL CHEMISTRY I</td>
<td>9</td>
</tr>
<tr>
<td>&amp; CH 362 H</td>
<td>and EXPERIMENTAL CHEMISTRY I</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 461 H</td>
<td>and EXPERIMENTAL CHEMISTRY II</td>
<td></td>
</tr>
<tr>
<td>CH 462 H</td>
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<tr>
<td>&amp; CH 463 H</td>
<td>and *EXPERIMENTAL CHEMISTRY II</td>
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</tr>
<tr>
<td>&amp; CH 464 H</td>
<td>and *EXPERIMENTAL CHEMISTRY II</td>
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</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Track-One BS Degree in Chemistry
(See the Advanced Biochemistry option and Advanced Chemistry option)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 271</td>
<td>and *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS</td>
<td></td>
</tr>
<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 272</td>
<td>and *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS</td>
<td></td>
</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 273</td>
<td>and *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS</td>
<td></td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS 2</td>
<td>4</td>
</tr>
<tr>
<td>CH 334</td>
<td>ORGANIC CHEMISTRY</td>
<td>9</td>
</tr>
<tr>
<td>&amp; CH 335</td>
<td>and ORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 336</td>
<td>and ORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 361</td>
<td>EXPERIMENTAL CHEMISTRY I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; CH 362</td>
<td>and EXPERIMENTAL CHEMISTRY I</td>
<td></td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Track-Two BS Degree in Chemistry
(See options for Biochemistry, Business, Chemistry Education, Chemical Engineering, Environmental Chemistry, Forensic Science, Materials Science, Pre-Medicine)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 271</td>
<td>and *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 272</td>
<td>and *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS</td>
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</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 273</td>
<td>and *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS</td>
<td></td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS 2</td>
<td>4</td>
</tr>
<tr>
<td>CH 334</td>
<td>ORGANIC CHEMISTRY</td>
<td>9</td>
</tr>
<tr>
<td>&amp; CH 335</td>
<td>and ORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>&amp; CH 336</td>
<td>and ORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 361</td>
<td>EXPERIMENTAL CHEMISTRY I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; CH 362</td>
<td>and EXPERIMENTAL CHEMISTRY I</td>
<td></td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
**Sample Curriculum (Track-One BS Degree in Chemistry)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231 &amp; CH 271</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 272</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS</td>
<td>5</td>
</tr>
<tr>
<td>CH 233 &amp; CH 273</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS</td>
<td>5</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC courses)</td>
<td>1-2</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>PH 211 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 211</td>
<td>5</td>
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<tr>
<td>Perspectives courses</td>
<td></td>
<td>6</td>
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<tr>
<td>Writing I</td>
<td></td>
<td>3</td>
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<tr>
<td>Speech</td>
<td></td>
<td>3</td>
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<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 212 or BI 102</td>
<td>4</td>
</tr>
<tr>
<td>CH 231 &amp; CH 271</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS</td>
</tr>
<tr>
<td>CH 232 &amp; CH 272</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS</td>
</tr>
<tr>
<td>CH 233 &amp; CH 273</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
</tr>
<tr>
<td>PH 211 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 211</td>
</tr>
<tr>
<td>Perspectives courses</td>
<td></td>
</tr>
<tr>
<td>Writing I</td>
<td></td>
</tr>
<tr>
<td>Elective and Option courses</td>
<td>18</td>
</tr>
</tbody>
</table>

| Total Hours | 47-48 |

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 334 &amp; CH 335</td>
<td>ORGANIC CHEMISTRY and ORGANIC CHEMISTRY</td>
</tr>
<tr>
<td>CH 336 &amp; CH 337</td>
<td>ORGANIC CHEMISTRY and ORGANIC CHEMISTRY</td>
</tr>
<tr>
<td>CH 361 &amp; CH 362</td>
<td>EXPERIMENTAL CHEMISTRY I and EXPERIMENTAL CHEMISTRY I</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Select one of the following options:</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>6-7</td>
</tr>
<tr>
<td>PH 212 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 211</td>
</tr>
<tr>
<td>PH 213 &amp; PH 223</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 213</td>
</tr>
</tbody>
</table>

| Total Hours | 48-49 |

**Sample Curriculum (Track-Two BS Degree in Chemistry)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231 &amp; CH 271</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 272</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS</td>
<td>5</td>
</tr>
<tr>
<td>CH 233 &amp; CH 273</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS</td>
<td>5</td>
</tr>
<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
<td>1-2</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>PH 211 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 211</td>
<td>5</td>
</tr>
<tr>
<td>Perspectives courses</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Writing I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Elective and Option courses</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

| Total Hours | 47-48 |

| CH 334 & CH 335 | ORGANIC CHEMISTRY and ORGANIC CHEMISTRY | 9     |
| CH 336 & CH 337 | ORGANIC CHEMISTRY and ORGANIC CHEMISTRY | 9     |
| CH 361 & CH 362 | EXPERIMENTAL CHEMISTRY I and EXPERIMENTAL CHEMISTRY I | 6     |
| MTH 254 | VECTOR CALCULUS I | 4     |

<table>
<thead>
<tr>
<th>Select one of the following groups:</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>6-7</td>
</tr>
<tr>
<td>PH 212 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 211</td>
</tr>
<tr>
<td>PH 213 &amp; PH 223</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECITATION FOR PHYSICS 213</td>
</tr>
</tbody>
</table>

| Total Hours | 48-49 |
Advanced Biochemistry Option

This option is offered within the following major(s):

- Chemistry · College of Science (p. 943)

This track-one option leads to a degree approved by the American Chemical Society. It is designed for students continuing their chemistry education in graduate school or seeking careers directly in the chemistry workforce. It provides a rigorous chemistry foundation with extensive laboratory experience. The mix of advanced courses in the option

BA Degree in Chemistry

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 334</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 356</td>
<td>and ORGANIC CHEMISTRY</td>
<td></td>
</tr>
<tr>
<td>CH 361</td>
<td>EXPERIMENTAL CHEMISTRY I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; CH 362</td>
<td>and EXPERIMENTAL CHEMISTRY II</td>
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</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>9</td>
</tr>
</tbody>
</table>

Total Hours: 177-184

1 For a stronger background in analytical chemistry, instead of CH 324, plus CH 411 and CH 412, substitute CH 421, CH 422, CH 461, CH 411 or CH 412, which adds 2 credits.

2 The 9 credits must be approved by the advisor and the department by the end of the winter quarter of the junior year and include 3 credits of lab.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)
is modified to emphasize biochemistry principles and laboratory techniques.

Option Code: 519

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 490</td>
<td>BIOCHEMISTRY 1: STRUCTURE AND FUNCTION</td>
<td>3</td>
</tr>
<tr>
<td>BB 491</td>
<td>BIOCHEMISTRY 2: METABOLISM</td>
<td>3</td>
</tr>
<tr>
<td>BB 492</td>
<td>BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>BB 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
<td>3</td>
</tr>
<tr>
<td>BB 494</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2</td>
<td>3</td>
</tr>
<tr>
<td>CH 411</td>
<td>INORGANIC CHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>or CH 412</td>
<td>INORGANIC CHEMISTRY</td>
<td></td>
</tr>
</tbody>
</table>

Select two courses from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 461</td>
<td>EXPERIMENTAL CHEMISTRY II</td>
<td></td>
</tr>
<tr>
<td>CH 462</td>
<td>*EXPERIMENTAL CHEMISTRY II</td>
<td></td>
</tr>
<tr>
<td>CH 463</td>
<td>*EXPERIMENTAL CHEMISTRY II</td>
<td></td>
</tr>
<tr>
<td>CH 464</td>
<td>*EXPERIMENTAL CHEMISTRY II</td>
<td></td>
</tr>
</tbody>
</table>

Career-supportive electives (CSE) 1 6

^ Writing Intensive Course (WIC)

Courses approved by the advisor by the end of the winter quarter of the junior year

Option Code: 519

Advanced Chemistry Option

This option is offered within the following major(s):

- Chemistry - College of Science (p. 943)

This track-one option leads to a degree approved by the American Chemical Society. Designed for students continuing their chemistry education in graduate school or seeking careers directly in the chemistry workforce. This provides the most rigorous and complete chemistry foundation with the most extensive laboratory experience. Undergraduate research is strongly encouraged. Knowledge and skills are developed in organic, analytical, physical and inorganic chemistry. Six advanced laboratory courses are required. Students have a choice of electives that support their career goals.

Option Code: 518

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 490</td>
<td>BIOCHEMISTRY 1: STRUCTURE AND FUNCTION</td>
<td>3</td>
</tr>
<tr>
<td>BB 491</td>
<td>BIOCHEMISTRY 2: METABOLISM</td>
<td>3</td>
</tr>
<tr>
<td>BB 492</td>
<td>BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>BB 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
<td>3</td>
</tr>
<tr>
<td>BB 494</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2</td>
<td>3</td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 212 &amp; BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>8</td>
</tr>
<tr>
<td>BI 311</td>
<td>GENETICS</td>
<td>4</td>
</tr>
</tbody>
</table>

Career-supportive electives (CSE) 2 12

^ Baccalaureate Core Course

Option Code: 518

Business Option

This option is offered within the following major(s):

- Chemistry - College of Science (p. 943)

The Business option is designed for chemists interested in, for example, opening a small business, working in sales and marketing, or as preparation for entering the MBA program at OSU 1. Students earn a BS degree in Chemistry in four years and can also fulfill course work required as part of the minor in Business and Entrepreneurship 2. This option is also a good stepping stone for law school or graduate studies in chemistry. The option includes six courses in accounting, law, finance, organizational systems.

Option Code: 518

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 491</td>
<td>fulfills 2 credits of Career Supported Electives if taken with BB 490</td>
<td></td>
</tr>
</tbody>
</table>

Courses approved by the advisor by the end of the winter quarter of the junior year; must include 3 credits of an upper-division lab, with CH 401 or CH 403 strongly recommended.
Students who complete these business courses and some additional courses may apply upon graduation to the OSU College of Business to be accepted into a 45-credit, three-term MBA program. All students serious about pursuing an OSU MBA should make an appointment with the College of Business MBA advisor (http://business.oregonstate.edu/mba/), 541-737-3716. Students should also take BA 211 and BA 213 at the undergraduate level.

There are additional requirements for the minor in Business and Entrepreneurship. For example, the minor also requires an orientation course, GPA requirements, and academic residency requirements. You are advised to meet with an advisor in the College of Business.

The Business option is designed for the Track-Two BS degree in Chemistry.

Option Code: 523

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 215</td>
<td>FUNDAMENTALS OF ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td>BA 260</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>4</td>
</tr>
<tr>
<td>BA 351</td>
<td>MANAGING ORGANIZATIONS</td>
<td>4</td>
</tr>
<tr>
<td>BA 360</td>
<td>INTRODUCTION TO FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>BA 390</td>
<td>MARKETING</td>
<td>4</td>
</tr>
<tr>
<td>ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ST 314</td>
<td>INTRODUCTION TO STATISTICS FOR ENGINEERS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or ST 351 INTRODUCTION TO STATISTICAL METHODS</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Select one course from among the three following suggested sets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 362</td>
<td>SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES</td>
<td></td>
</tr>
<tr>
<td>BA 363</td>
<td>TECHNOLOGY AND INNOVATION MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>BA 460</td>
<td>VENTURE MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>Suggested for emphasis in small business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRKT 488</td>
<td>PERSONAL SELLING</td>
<td></td>
</tr>
<tr>
<td>Suggested for emphasis in sales and marketing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested for MBA preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA 357</td>
<td>OPERATIONS MANAGEMENT</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Hours 31-32

* Baccalaureate Core Course (BCC)

BA 357 requires a special override from an advisor in the COB because chemistry majors substitute ST 351 or ST 314 for BA 276.

Option Code: 303

The track-two core requirements are slightly modified for the Chemical Engineering option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td></td>
</tr>
<tr>
<td>&amp; PH 212</td>
<td>and *GENERAL PHYSICS WITH CALCULUS</td>
<td></td>
</tr>
<tr>
<td>&amp; PH 213</td>
<td>and *GENERAL PHYSICS WITH CALCULUS (Required)</td>
<td></td>
</tr>
<tr>
<td>CH 462</td>
<td>*EXPERIMENTAL CHEMISTRY II (Recommended)</td>
<td></td>
</tr>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHE 211</td>
<td>(Terminated 201101)</td>
<td>4</td>
</tr>
<tr>
<td>CHE 212</td>
<td>(Terminated 201101)</td>
<td>4</td>
</tr>
<tr>
<td>CHE 411</td>
<td>MASS TRANSFER OPERATIONS</td>
<td>4</td>
</tr>
<tr>
<td>CHE 412</td>
<td>(Terminated 200901)</td>
<td>3</td>
</tr>
<tr>
<td>CHE 443</td>
<td>CHEMICAL REACTION ENGINEERING</td>
<td>4</td>
</tr>
<tr>
<td>ME 331</td>
<td>INTRODUCTORY FLUID MECHANICS</td>
<td>4</td>
</tr>
<tr>
<td>ME 332</td>
<td>HEAT TRANSFER</td>
<td>4</td>
</tr>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td></td>
</tr>
</tbody>
</table>

Select one course from the following: 3-4

CH 401 | RESEARCH  
or CHE 401 | RESEARCH

CHE 311 | THERMODYNAMICS

CHE 312 | CHEMICAL ENGINEERING THERMODYNAMICS

CHE 331 | TRANSPORT PHENOMENA I

CHE 332 | TRANSPORT PHENOMENA II

CHE 361 | CHEMICAL PROCESS DYNAMICS AND SIMULATION

CHE 444 | THIN FILM MATERIALS PROCESSING

CHE 445 | POLYMER ENGINEERING AND SCIENCE  
or ENGR 213 | STRENGTH OF MATERIALS

CHE 461 | PROCESS CONTROL

ENGR 321 | *

Total Hours 34-35

* Baccalaureate Core Course
^ Writing Intensive Course (WIC)

Option Code: 303

Chemistry Education Option

This option is offered within the following major(s):

- Chemistry - College of Science (p. 943)

The Chemistry Education option is directed at students planning to teach high school chemistry or continuing on with graduate education and teaching careers at community colleges. Students can earn a BS degree in Chemistry in four years and obtain experience that can be useful when applying for the Master of Science in Science Education from OSU. This option includes 11 courses covering teaching methods, a secondary area, and undergraduate teaching internship and seminar in chemistry.

The Chemistry Education option is designed for the Track-Two BS degree in Chemistry.

Option Code: 516

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 407</td>
<td>SEMINAR (Chemistry Teaching)</td>
<td>1</td>
</tr>
<tr>
<td>CH 410</td>
<td>INTERNSHIP (Undergraduate Teaching)</td>
<td>3</td>
</tr>
<tr>
<td>ED 309</td>
<td>FIELD PRACTICUM</td>
<td>3</td>
</tr>
<tr>
<td>or ED 409</td>
<td>PRACTICUM/CLINICAL EXPERIENCE</td>
<td></td>
</tr>
</tbody>
</table>

The Chemical Engineering option offers selected chemical engineering concepts that may enhance career opportunities in areas such as electronics, polymers, and biotechnology, or prepare students for graduate studies in chemistry or related fields. Students can earn a BS degree in Chemistry in four years while targeting a career direction. This option includes nine courses in basic engineering and chemical engineering including mass and fluid transport, reaction engineering, and separations processes.

The Chemical Engineering option is designed for the Track-Two BS degree in Chemistry.
Option Code: 516

Environmental Chemistry Option

This option is offered within the following major(s):

- Chemistry - College of Science (p. 943)

The Environmental Chemistry option is structured to provide a quality foundation for working in government, industrial or university labs studying the behavior of chemicals in the environment. It also is suited to graduate education in chemistry or environmental chemistry. Students can earn a BS degree in Chemistry in four years while targeting their career. This option includes 11 courses in biology, microbiology, toxicology, environmental chemistry and health, soil science, and hydrology.

The Environmental Chemistry option is designed for the Track-Two BS degree in Chemistry.

Option Code: 504

Forensic Science Option

This option is offered within the following major(s):

- Chemistry - College of Science (p. 943)

The Forensic Science option is appropriate for students interested in working in a crime lab or pursuing a graduate degree in forensic science or chemistry. Students can earn a BS degree in Chemistry in four years and also take a combination of courses that enhance a chemistry major's background in biology, biochemistry, and related areas that can be important in forensic science.

The Forensic Science option is designed for the Track-Two BS degree in Chemistry.

Option Code: 505

The track-two core requirements are slightly modified for the Forensic Science option as follows:
Materials Science Option

This option is offered within the following major(s):

• Chemistry - College of Science (p. 943)

The Materials Science option is customized to include applied courses in a variety of materials areas to enhance career opportunities in, for example, electronics, polymers and biotechnology. Students can earn a BS degree in Chemistry in four years while targeting a career in this field or preparing for graduate school in chemistry or related areas.

The Materials Science option is designed for the Track-Two BS degree in Chemistry.

Option Code: 505

Mathematics

The department offers programs leading to the BS, MA, MS, and PhD degrees in Mathematics. Undergraduate minors are offered in Mathematics and Actuarial Science.

Students interested in teaching mathematics at the secondary level should contact a departmental advisor and discuss the Secondary Teaching Emphasis option available under the Mathematics major. Likewise, students interested in careers in the area of financial mathematics or as actuaries should meet with a member of the departmental Actuarial Sciences Committee.

Additional information pamphlets about both the undergraduate and graduate programs are available on the Department of Mathematics website.

The Mathematics major requirements at the upper division comprise about 45 credits of course work. This leaves about 45 credits of free...
electives that can be used to design a degree program in mathematics that is tailored to each major's particular interests.

**Undergraduate Programs**

**Major**
- Mathematics (p. 963)
  - Options:
    - Applied and Computational Mathematics
    - Mathematical Biology
    - Secondary Teaching Emphasis
    - Statistics

**Minors**
- Actuarial Science (p. 962)
- Mathematics (p. 962)

**Graduate Programs**

**Major**
- Mathematics (p. 962)

**Minor**
- Mathematics (p. 962)

William Bogley, Department Head  
368I Kidder Hall  
Oregon State University  
Corvallis, OR 97331-4605  
Phone: 541-737-5158  
Email: bill.bogley@oregonstate.edu  
Website: http://www.math.oregonstate.edu/

**Faculty**

**Professors** Bogley, Bokil, De Leenheer, Dick, Dray, Escher, Faridani, Finch, Flahive, Higdon, Kovchevog, Ossiander, Peszynska, Pohjanpelto, Restrepo, Schmidt, Showalter, Swisher, Thomann  
**Associate Professors** Beisiegel, Cozzi, Dascaliuc, Gibson, Guo, Lockwood, Petsche  
**Assistant Professors** Dalziel  
**Adjunct Professors** Batten (ME), Manogue (PH)  
**Adjunct Associate Professor** Medlock (VBS), Zhang (ECE)

**Mathematics**

**MTH 065. ELEMENTARY ALGEBRA. (3 Credits)**  
Arithmetic of signed numbers, order of operations, simplifying algebraic expressions, solutions of linear equations, and inequalities. Rules of exponents, addition, subtraction, and multiplication of polynomials, factoring, solution of quadratic equations by factoring, reducing rational expressions. Word problems involving linear equations, graphing of linear equations, inequalities. All courses used to satisfy MTH prerequisites must be completed with C- or better.  
**Prerequisites:** Math Placement Test with a score of 05 or Math Placement - ALEKS with a score of 015

**MTH 095. INTERMEDIATE ALGEBRA. (3 Credits)**  
Addition, subtraction, multiplication, and division of rational expressions, long division of polynomials, solutions of fractional equations, applications involving linear equations. Fractional equations, inequalities, literal equations, and variations. Negative and fractional exponents, radicals, solutions of quadratic equations, and complex numbers. Cartesian coordinates, graphs of linear equations and inequalities, distance formula, slope, equations of lines, solutions of systems of linear equations in two unknowns and inequalities. All courses used to satisfy MTH prerequisites must be completed with C- or better.  
**Prerequisites:** MTH 065 with C- or better or Math Placement Test with a score of 11 or Math Placement - ALEKS with a score of 030

**MTH 102. ALGEBRAIC FOUNDATIONS. (3 Credits)**  
This course is designed primarily for EOP students. They will use various computing technologies to explore realistic and interesting situations in which algebra is used. As they work through explorations, they will work with many of the fundamental ideas of algebra, ideas they will find important in their daily lives.  
**MTH 103. ALGEBRAIC REASONING. (4 Credits)**  
Graphing data, functions, rate of change, linear equations, systems of linear equations, linear inequalities, linear functions, absolute value functions, quadratic functions, exponential functions. All courses used to satisfy MTH prerequisites must be completed with C- or better.  
**Prerequisites:** MTH 065 with C- or better or Math Placement Test with a score of 11 or Math Placement - ALEKS with a score of 030

**MTH 105. INTRODUCTION TO CONTEMPORARY MATHEMATICS. (3 Credits)**  
Elementary linear programming, combinatorics, descriptive statistics, elementary probability, exponential growth and decay, examples of major mathematical ideas and models. Lec/rec. (Bacc Core Course)  
**Attributes:** CSMA – Core, Skills, Math  
**Recommended:** MTH 095 or MTH 103 or (MPT=Math Placement Test score of 17; MPAL=Math Placement Test-ALEKS score of 46%)

**MTH 111. COLLEGE ALGEBRA. (4 Credits)**  
Polynomial equations and inequalities, polynomial functions and graphs, inverse functions, exponential and logarithmic functions, elementary mathematical modeling and applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)  
**Attributes:** CSMA – Core, Skills, Math  
**Prerequisites:** MTH 095 with C- or better or MTH 103 with C- or better or Math Placement Test with a score of 17 or Math Placement - ALEKS with a score of 046

**MTH 112. ELEMENTARY FUNCTIONS. (4 Credits)**  
Triangle trigonometry, circular functions and graphs, trigonometric equations and identities, inverse trigonometric functions, polar coordinates, vectors and applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)  
**Attributes:** CSMA – Core, Skills, Math  
**Prerequisites:** MTH 095 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060  
**Equivalent to:** MTH 150X

**MTH 199. SPECIAL TOPICS. (1-16 Credits)**  
Maximum 3 credits per term, 9 credits total. Does not meet university group requirement in physical science.  
**This course is repeatable for 9 credits.**
MTH 211. *FOUNDATIONS OF ELEMENTARY MATHEMATICS. (4 Credits)
Introduction to problem solving, sets, whole numbers, number theory, fractions. Intended primarily for prospective elementary teachers. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 095 with C- or better or MTH 103 with C- or better or MTH 111 with C- or better or MTH 112 with C- or better or Math Placement Test with a score of 17 or Math Placement - ALEKS with a score of 046

MTH 212. FOUNDATIONS OF ELEMENTARY MATHEMATICS. (4 Credits)
Math 212 is the second of a three-term sequence of courses designed to help prepare prospective elementary and middle school teachers. Topics covered include fractions, decimals, percent, ratio and proportion, integers, rational numbers, real numbers, probability and statistics.
Prerequisites: MTH 211 with C- or better

MTH 227. *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I. (4 Credits)
Review of exponential and trigonometric functions, including examples of exponential and periodic behavior; discrete probability; examples of biologically motivated difference equations; differentiation of polynomials, exponential and trigonometric functions with applications to optimization. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 112 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 75
Equivalent to: MTH 227X

MTH 228. CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II. (4 Credits)
Continuation of MTH 227 with more general population growth models. Antidifferentiation; The Fundamental Theorem of Calculus applied to solving continuous growth models. Continuous random variables. Basic linear algebra of small systems sufficient to calculate eigenvalues and eigenvectors and appreciate their use in life science applications. Lec/rec.
Prerequisites: MTH 227 with C- or better or MTH 227X with C- or better

MTH 231. ELEMENTS OF DISCRETE MATHEMATICS. (4 Credits)
Elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: MTH 231H

MTH 231H. ELEMENTS OF DISCRETE MATHEMATICS. (4 Credits)
Elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: MTH 231

MTH 241. *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE. (4 Credits)
Elementary differential calculus of polynomial, logarithmic, and exponential functions and their applications to business, management and social sciences. Lec/rec. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060

MTH 245. *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES. (4 Credits)
Techniques of counting, probability and elements of statistics including binomial and normal distributions. Introductory matrix algebra. Elements of linear programming. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060

MTH 251. *DIFFERENTIAL CALCULUS. (4 Credits)
Differential calculus for engineers and scientists. Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 111 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 075
Equivalent to: MTH 251H

MTH 251H. *DIFFERENTIAL CALCULUS. (4 Credits)
Differential calculus for engineers and scientists. Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math; HNRS – Honors Course Designator
Prerequisites: MTH 112 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 075
Equivalent to: MTH 251

MTH 252. INTEGRAL CALCULUS. (4 Credits)
Definite integrals, elementary applications to area, force, and work. Integral tables and basic techniques of integration, calculus of logarithmic and exponential functions, polar coordinates, applications to areas, volumes, force, work, and growth and decay problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 251 with C- or better or MTH 251H with C- or better
Equivalent to: MTH 252H
MTH 252H. INTEGRAL CALCULUS. (4 Credits)
Definite integrals, elementary applications to area, force, and work. Integral tables and basic techniques of integration, calculus of logarithmic and exponential functions, polar coordinates, applications to areas, volumes, force, work, and growth and decay problems. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 251 with C- or better or MTH 251H with C- or better
Equivalent to: MTH 252

MTH 253. INFINITE SERIES AND SEQUENCES. (4 Credits)
Indeterminate forms. Improper integrals. Sequences and series, especially Taylor’s formula and power series. Applications to numerical estimation with error analysis. Series with complex terms and the Euler identities. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 253H

MTH 254. VECTOR CALCULUS I. (4 Credits)
Vectors, vector functions, and curves in two and three dimensions. Surfaces, partial derivatives, gradients, and directional derivatives. Multiple integrals in rectangular, polar, cylindrical, and spherical coordinates. Physical and geometric applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 254H

MTH 254H. VECTOR CALCULUS I. (4 Credits)
Vectors, vector functions, and curves in two and three dimensions. Surfaces, partial derivatives, gradients, and directional derivatives. Multiple integrals in rectangular, polar, cylindrical, and spherical coordinates. Physical and geometric applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 254

MTH 255. VECTOR CALCULUS II. (4 Credits)
Brief review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss and Stokes with applications to force, work, mass, and charge. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 255H

MTH 255H. VECTOR CALCULUS II. (4 Credits)
Brief review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss and Stokes with applications to force, work, mass, and charge. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 255

MTH 256. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler’s identities is highly desirable.) Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256H

MTH 256H. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler’s identities is highly desirable.) All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256

MTH 256. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler’s identities is highly desirable.) Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256H

MTH 256H. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler’s identities is highly desirable.) All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256

MTH 264. INTRODUCTION TO MATRIX ALGEBRA. (2 Credits)
Introduction to matrix algebra: systematic solution to systems of linear equations; linear transformations; eigenvalue problems.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better

MTH 264H. INTRODUCTION TO MATRIX ALGEBRA. (2 Credits)
Introduction to matrix algebra: systematic solution to systems of linear equations; linear transformations; eigenvalue problems.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better

MTH 265. INTRODUCTION TO SERIES. (2 Credits)
Convergence and divergence of numerical series, including geometric series. Series of functions. Power series and their analytic properties. Taylor series expansions and Taylor polynomials.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better

MTH 265H. INTRODUCTION TO SERIES. (2 Credits)
Convergence and divergence of numerical series, including geometric series. Series of functions. Power series and their analytic properties. Taylor series expansions and Taylor polynomials.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 265

MTH 299. SPECIAL TOPICS. (0-16 Credits)
Maximum 3 credits per term, 9 credits total. This course is repeatable for 9 credits.

MTH 306. MATRIX AND POWER SERIES METHODS. (4 Credits)
Introduction to matrix algebra, determinants, systematic solution to linear systems, and eigenvalue problems. Convergence and divergence of series with emphasis on power series, Taylor series expansions, convergence tests for power series, and error estimates for truncated series used in practical approximations. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 306H
MTH 306H. MATRIX AND POWER SERIES METHODS. (4 Credits)
Introduction to matrix algebra, determinants, systematic solution to linear systems, and eigenvalue problems. Convergence and divergence of series with emphasis on power series, Taylor series expansions, convergence tests for power series, and error estimates for truncated series used in practical approximations. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 306

MTH 311. ADVANCED CALCULUS. (4 Credits)
Rigorous development of calculus, axiomatic properties of R, topology of the real line, convergence of sequences and series of real numbers, functions, limits of functions, basic properties of continuity and derivatives. Brief treatment of Riemann integration, improper integrals, sequences of functions, pointwise and uniform convergence, introductory aspects of multivariable calculus. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: (MTH 254 with C- or better or MTH 254H with C- or better) and MTH 355 [C-]

MTH 312. ADVANCED CALCULUS. (4 Credits)
Rigorous development of calculus, axiomatic properties of R, topology of the real line, convergence of sequences and series of real numbers, functions, limits of functions, basic properties of continuity and derivatives. Brief treatment of Riemann integration, improper integrals, sequences of functions, pointwise and uniform convergence, introductory aspects of multivariable calculus. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 311 with C- or better

MTH 321. INTRODUCTORY APPLICATIONS OF MATHEMATICAL SOFTWARE. (3 Credits)
An introduction to select mathematical software packages to support problem solving and applications. Topics include using computational resources to solve basic numerical and symbolic problems in mathematics, visualization and presentation of data, creation of simple programming scripts, and applications of basic programming techniques to promote mathematical understanding. The scientific typesetting language LaTex will also be covered. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 341 with C- or better or (MTH 264 with C- or better or MTH 264H with C- or better) or (MTH 306 with C- or better or MTH 306H with C- or better)

MTH 323. *MATHEMATICAL MODELING. (3 Credits)
A variety of mathematical modeling techniques will be introduced. Students will formulate models in response to practical problems drawn from the literature of ecology, environmental sciences, engineering or other fields. Informal writing assignments in class and formal written presentation of the models will be required. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC
Prerequisites: MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]

MTH 333. *FUNDAMENTAL CONCEPTS OF TOPOLOGY. (3 Credits)
Open and closed sets, continuity, compactness, connectedness, winding number, fixed point theorems in the plane. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC
Prerequisites: MTH 341 with C- or better or MTH 355 with C- or better

MTH 338. *NON-EUCLIDEAN GEOMETRY. (3 Credits)
Introduction to non-Euclidean geometries. Selected topics such as hyperbolic and elliptic geometry, spherical geometry, projective geometry, geometries arising from alternative metrics. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better

MTH 341. LINEAR ALGEBRA I. (3 Credits)
Matrix algebra, determinants, systems of linear equations, subspaces, an introductory study of eigenvalues and eigenvectors. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better

MTH 342. LINEAR ALGEBRA II. (4 Credits)
Abstract (real or complex) vector spaces, linear transformations, inner product spaces, orthogonality, eigenspaces and diagonalization, spectral theorems, singular value decomposition. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 341 with C- or better

MTH 343. INTRODUCTION TO MODERN ALGEBRA. (3 Credits)
Introduction to rings and fields with an emphasis on the integers and polynomial rings; selected applications. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 341 with C- or better and MTH 355 [C-]

MTH 351. INTRODUCTION TO NUMERICAL ANALYSIS. (3 Credits)
Introduction to the computation of approximate solutions to mathematical problems that cannot be solved by hand: analysis of errors; rootfinding for nonlinear equations in one variable; interpolation of functions; numerical integration. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 253 with C- or better or (MTH 306 with C- or better or MTH 306H with C- or better) or ((MTH 264 with C- or better or MTH 264H with C- or better) and (MTH 265 [C-] or MTH 265H [C-]))
Recommended: Programming experience

MTH 355. DISCRETE MATHEMATICS. (3 Credits)
Proof analysis and development in the context of discrete mathematics for math majors transitioning to upper-division course work. Topics include elementary logic and set theory; quantifiers, basic counting principles, elementary combinatorics, equivalence relations, the binomial theorem, and mathematical induction. Additional topics may include recurrence relations, generating functions, and introductory graph theory. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 253 with C- or better

Recommended: MTH 341

MTH 361. INTRODUCTION TO PROBABILITY. (3 Credits)
Probability problem solving using concepts developed in calculus. Topics include probability models, discrete and continuous random variables, expectation and variance, the law of large numbers, and the central limit theorem. All courses used to satisfy MTH prerequisites must be completed with C- or better.

Prerequisites: MTH 253 with C- or better or (MTH 306 with C- or better or MTH 306H with C- or better) or (MTH 265 with C- or better or MTH 265H with C- or better)
Equivalent to: MTH 361H
MTH 390. FOUNDATIONS OF ELEMENTARY MATHEMATICS. (4 Credits)
Math 390 is the third of a three-term sequence of classes designed to help prepare prospective elementary and middle school teachers. Topics covered include informal geometry, measurement, congruence, similarity, coordinate and transformational geometry.
Prerequisites: MTH 211 with C- or better and MTH 212 [C-]
Equivalent to: MTH 213
MTH 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
MTH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: MTH 399
This course is repeatable for 16 credits.
MTH 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
MTH 402. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
MTH 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.
MTH 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
MTH 406. PROJECTS. (1-3 Credits)
Graded P/N.
This course is repeatable for 99 credits.
MTH 407. SEMINAR. (3 Credits)
This course is repeatable for 16 credits.
MTH 410. OCCUPATIONAL INTERNSHIP. (3-12 Credits)
Planned and supervised training experience at selected government, industrial, or business placement sites. Must be followed by a one-hour post-internship seminar. Consult departmental head advisor. Graded P/N.
This course is repeatable for 99 credits.
MTH 411. REAL ANALYSIS. (3 Credits)
Properties of metric spaces and normed spaces, including lp spaces. Completeness and applications, including fixed point theorems. Compactness. Equicontinuity and the Arzela-Ascoli theorem. Uniform continuity and uniform convergence, including applications.
Prerequisites: MTH 312 with B+ or better and MTH 341 [B+]
This course is repeatable for 18 credits.
MTH 412. REAL ANALYSIS. (3 Credits)
Measure and integration theory, basic convergence theorems, Lebesgue spaces, Fubini's theorem, Radon-Nikodym theorem, and applications. Banach spaces including Baire category theorems, and Hilbert spaces.
Prerequisites: MTH 411 with C- or better or MTH 511 with C- or better
This course is repeatable for 18 credits.
MTH 413. REAL ANALYSIS. (3 Credits)
Measure and integration theory, basic convergence theorems, Lebesgue spaces, Fubini's theorem, Radon-Nikodym theorem, and applications. Banach spaces including Baire category theorems, and Hilbert spaces.
Prerequisites: MTH 412 with C- or better or MTH 512 with C- or better
This course is repeatable for 18 credits.
MTH 419. MULTIVARIABLE ADVANCED CALCULUS. (3 Credits)
A rigorous development of multivariable advanced calculus, including continuity and compactness in multivariable Euclidean spaces, differentiation and approximation of multivariable functions, the inverse function theorem and the implicit function theorem, integration in several variables.
Prerequisites: MTH 312 with B or better
MTH 420. MODELS AND METHODS OF APPLIED MATHEMATICS. (3 Credits)
Discrete and continuous mathematical models and methods for analysis, including linear analysis, equilibrium and minimum principles, calculus of variations, principal component analysis and orthogonal expansions, asymptotic and Fourier analysis, least squares, constrained and unconstrained optimization, inverse problems, and Monte Carlo techniques. Particular models and methods covered may vary annually. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]
MTH 427. INTRODUCTION TO MATHEMATICAL BIOLOGY. (3 Credits)
Modeling and mathematical analysis of biological processes using first principles at scales ranging from the molecular to the population level. Deterministic models are studied in both discrete and continuous time and analyzed using linearization principles, linear and nonlinear stability techniques, phase plane methods, and methods from partial differential equations. Results obtained from mathematical analysis will be qualitatively interpreted and applied to the biological process under investigation. All courses used to satisfy MTH prerequisites must be completed with a C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]
MTH 428. STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY. (3 Credits)
An introduction to stochastic modeling of biological processes. The stochastic models covered may include Markov processes in both continuous and discrete time, urn models, branching processes, and coalescent processes. The biological applications may include genetic drift, population dynamics, genealogy, demography, and epidemiology. Mathematical results will be qualitatively interpreted and applied to the biological process under investigation.
Prerequisites: MTH 341 with C or better and (MTH 361 [C] or MTH 463 [C] or MTH 563 [C])
MTH 430. METRIC SPACES AND TOPOLOGY. (3 Credits)
Fundamental notions of metric space topology. Examples of Euclidean, non-Euclidean and other fundamental metric spaces including the Hilbert Cube and two-dimensional surfaces. Characterization and classification results for metric spaces. Selected applications of topology, possibly including the structure of molecules and/or networks. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 311 with C- or better
Recommended: MTH 311
MTH 434. INTRODUCTION TO DIFFERENTIAL GEOMETRY. (3 Credits)
Curves and surfaces in Euclidean space; geodesics; curvature; introduction to tensor algebra and differential forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 255 with C- or better or MTH 255H with C- or better) and MTH 342 [C-]
Recommended: MTH 311
MTH 435. DIFFERENTIAL GEOMETRY. (3 Credits)
Differentiable 2-manifolds; curvature; geodesics; tensor algebra and the algebra of exterior differential forms with emphasis on Euclidean space; differentiation of tensors and forms; integration of forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 434 with C- or better or MTH 534 with C- or better
MTH 437. GENERAL RELATIVITY. (3 Credits)
Geometry of special relativity. Tensor analysis, metrics, geodesics, curvatures. Einstein field equations, cosmological models, black holes. Selected topics such as global structure, conserved quantities, spinors. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 434 with C- or better or MTH 534 with C- or better)
Recommended: MTH 311

MTH 440. COMPUTATIONAL NUMBER THEORY. (3 Credits)
Development of the number theory used in some basic tests of primality and methods of factoring integers. Applications to cryptography. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 231 with C- or better or MTH 343 with C- or better or MTH 355 with C- or better

MTH 441. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, and error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 343 with C- or better and (MTH 342 [C-] or MTH 440 [C-] or MTH 540 [C-])

MTH 442. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, and error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 441 with C- or better or MTH 541 with C- or better

MTH 443. ABSTRACT LINEAR ALGEBRA. (3 Credits)
Abstract vector spaces. Linear transformations, eigenvectors, and eigenvectors. The Jordan canonical form, inner product spaces. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 341 with C- or better
Recommended: Programming experience, MTH 342 and MTH 351

MTH 452. NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of initial-value problems using Runge-Kutta methods and linear multistep methods; introduction to boundary-value problems. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and ((MTH 306 with C- or better or MTH 306H with C- or better) or MTH 341 with C- or better or (MTH 264 with C- or better or MTH 264H with C- or better)) and (MTH 265 [C-] or MTH 265H [C-])
Recommended: MTH 351 or MTH 451 or MTH 551

MTH 453. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of boundary value problems and initial-boundary value problems using finite difference and finite element methods. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 452 with C- or better or MTH 552 with C- or better

MTH 454. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of partial differential equations, separation of variables, transform methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 480 with C- or better or MTH 481 with C- or better

MTH 455. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of partial differential equations, separation of variables, transform methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 480 with C- or better or MTH 481 with C- or better

MTH 463. PROBABILITY I. (3 Credits)
An introduction to probability theory; topics covered include: the axioms of probability, probability spaces and models, independence, random variables; densities, distributions, expectation, and variance; probability inequalities, the law of large numbers, and the binomial central limit theorem. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 311 (may be taken concurrently) with C- or better

MTH 464. PROBABILITY II. (3 Credits)
Transformations of random variables; sums of independent random variables, generating functions, characteristic functions, the central limit theorem and other weak limit theorems. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 463 with C- or better or MTH 563 with C- or better) and MTH 341 [C-]

MTH 465. PROBABILITY III. (3 Credits)
Random variables, central limit theorem; distributions of standard statistics; Markov chains, continuous and discontinuous stochastic processes. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 464 with C- or better or MTH 564 with C- or better

MTH 467. ACTUARIAL MATHEMATICS. (3 Credits)
Foundations of actuarial science from the point of view of mathematical models that arise in the design and management of insurance systems. Most models will be life insurance based. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 463 with C- or better or MTH 563 with C- or better and ST 421 with C- or better

MTH 480. SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Systems of two first-order differential equations, phase portraits, linearization and the stability of equilibria, conservative systems, reversible systems, limit cycles and the Poincare-Bendixon Theorem. Additional topics selected from Hamiltonian systems, Hopf bifurcation or Lorenz equations and chaos. MTH 480 and MTH 481 cannot both be taken for credit. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]

MTH 481. APPLIED ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Linear and nonlinear systems of ordinary differential equations, elementary stability theory, higher order equations, boundary value problems, series solution of ordinary differential equations. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and ((MTH 253 with C- or better or MTH 253H with C- or better) or (MTH 265 with C- or better or MTH 265H with C- or better) or (MTH 341 [C-] or (MTH 264 [C-] or MTH 264H [C-]) or (MTH 306 [C-] or MTH 306H [C-]))

MTH 482. APPLIED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Partial differential equations, Bessel's and Legendre's equations, Fourier analysis, separation of variables, transform methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 480 with C- or better or MTH 481 with C- or better and MTH 581 with C- or better
MTH 493. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Major results of Euclidean geometry, axiom systems for Euclidean geometry, dependency tree of Euclidean theorems, groups of geometric transformations with applications to symmetries of plane and solid objects, Euler's formula, tilings and tessellations, isometries and similitudes of the plane (translations, rotations, reflections, glide reflections, dilations). Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 491 with C- or better or MTH 592 with C- or better

MTH 492. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
This course is repeatable for 18 credits.

MTH 491. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
This course is repeatable for 99 credits.

MTH 490. INTENSIVE SUMMER RESEARCH IN MATHEMATICS. (12 Credits)
Combination of seminar, lectures, and individual research projects designed to introduce students to research mathematics.
This course is repeatable for 99 credits.

MTH 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 510. OCCUPATIONAL INTERNSHIP. (3-12 Credits)
Planned and supervised training experience at selected government, industrial, or business placement sites. Must be followed by a one-hour post-internship seminar. Consult departmental head advisor. Graded P/N.
This course is repeatable for 16 credits.

MTH 511. REAL ANALYSIS. (3 Credits)
Properties of metric spaces and normed spaces, including lp spaces. Completeness and applications, including fixed point theorems. Compactness. Equicontinuity and the Arzela-Ascoli theorem. Uniform continuity and uniform convergence, including applications.
This course is repeatable for 18 credits.
Recommended: MTH 312 and MTH 341

MTH 512. REAL ANALYSIS. (3 Credits)
Prerequisites: MTH 511 with C- or better
This course is repeatable for 18 credits.

MTH 513. REAL ANALYSIS. (3 Credits)
Prerequisites: MTH 512 with C- or better
This course is repeatable for 18 credits.

MTH 520. MODELS AND METHODS OF APPLIED MATHEMATICS. (3 Credits)
Discrete and continuous mathematical models and methods for analysis, including linear analysis, equilibrium and minimum principles, calculus of variations, principal component analysis and orthogonal expansions, asymptotic and Fourier analysis, least squares, constrained and unconstrained optimization, inverse problems, and Monte Carlo techniques. Particular models and methods covered may vary annually. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 256 or MTH 256H) and MTH 341

MTH 524. DYNAMICAL SYSTEMS THEORY AND APPLICATIONS. (3 Credits)
Theory, models, and problems for discrete and/or continuous dynamical systems. Depending on term, the emphasis may be toward deterministic or stochastic systems. Topics generally include stability theory, periodic behavior, and chaotic systems. Models selected from biology, economics, fluid dynamics, and electrical and mechanical systems. May be repeated once for credit with a different topic. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 624
Recommended: MTH 341 and MTH 342 and MTH 311 and MTH 312 and MTH 361
MTH 525. DYNAMICAL SYSTEMS THEORY AND APPLICATIONS. (3 Credits)
Theory, models, and problems for discrete and/or continuous dynamical systems. Depending on term, the emphasis may be toward deterministic or stochastic systems. Topics generally include stability theory, periodic behavior, and chaotic systems. Models selected from biology, economics, fluid dynamics, and electrical and mechanical systems. May be repeated once for credit with a different topic. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 625
This course is repeatable for 6 credits.
Recommended: MTH 341 and MTH 342 and MTH 311 and MTH 312 and MTH 361

MTH 527. INTRODUCTION TO MATHEMATICAL BIOLOGY. (3 Credits)
Modeling and mathematical analysis of biological processes using first principles at scales ranging from the molecular to the population level. Deterministic models are studied in both discrete and continuous time and analyzed using linearization principles, linear and nonlinear stability techniques, phase plane methods, and methods from partial differential equations. Results obtained from mathematical analysis will be qualitatively interpreted and applied to the biological process under investigation. All courses used to satisfy MTH prerequisites must be completed with a C or better.
Recommended: (MTH 256 or MTH 256H) and MTH 341

MTH 528. STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY. (3 Credits)
An introduction to stochastic modeling of biological processes. The stochastic models covered may include Markov processes in both continuous and discrete time, urn models, branching processes, and coalescent processes. The biological applications may include genetic drift, population dynamics, genealogy, demography, and epidemiology. Mathematical results will be qualitatively interpreted and applied to the biological process under investigation. All courses used to satisfy MTH prerequisites must be completed with a C or better.
Recommended: MTH 341 and (MTH 361 or MTH 463 or MTH 563)

MTH 531. GENERAL TOPOLOGY AND FUNDAMENTAL GROUPS. (3 Credits)
Topological spaces and maps. Separation axioms, compactness, convergence, extension theorems, metrizability and compactification. Product spaces and simplicial complexes. Definition and basic properties of the fundamental group functor, with applications to the theory of covering spaces. Selected topics from dimension theory, manifold theory, and other areas of topology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 623, MTH 631

MTH 532. GENERAL TOPOLOGY AND FUNDAMENTAL GROUPS. (3 Credits)
Topological spaces and maps. Separation axioms, compactness, convergence, extension theorems, metrizability and compactification. Product spaces and simplicial complexes. Definition and basic properties of the fundamental group functor, with applications to the theory of covering spaces. Selected topics from dimension theory, manifold theory, and other areas of topology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 632

MTH 534. INTRODUCTION TO DIFFERENTIAL GEOMETRY. (3 Credits)
Curves and surfaces in Euclidean space; geodesics; curvature; introduction to tensor algebra and differential forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 255 or MTH 255H) and MTH 342 and MTH 311

MTH 535. DIFFERENTIAL GEOMETRY. (3 Credits)
Differentiable 2-manifolds; curvature; geodesics; tensor algebra and the algebra of exterior differential forms with emphasis on Euclidean space; differentiation of tensors and forms; integration of forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 434 or MTH 534

MTH 537. GENERAL RELATIVITY. (3 Credits)
Geometry of special relativity. Tensor analysis, metrics, geodesics, curvature. Einstein field equations, cosmological models, black holes. Selected topics such as global structure, conserved quantities, spinors. All courses used to satisfy MTH prerequisites must be completed with C or better.
Prerequisites: MTH 434 with C or better or MTH 534 with C or better
Recommended: MTH 311

MTH 540. COMPUTATIONAL NUMBER THEORY. (3 Credits)
Development of the number theory used in some basic tests of primality and methods of factoring integers. Applications to cryptology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 231 or MTH 343 or MTH 355

MTH 541. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 343 and (MTH 342 or MTH 440 or MTH 540)

MTH 542. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 441 or MTH 541

MTH 543. ABSTRACT LINEAR ALGEBRA. (3 Credits)
Abstract vector spaces. Linear transformations, eigenvalues and eigenvectors, the Jordan canonical form, inner product spaces. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 342 and MTH 343

MTH 551. NUMERICAL LINEAR ALGEBRA. (3 Credits)
Computation of solutions of linear systems using direct and iterative methods; least-squares solution of overdetermined systems; computation of eigenvalues and eigenvectors. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 341, MTH 342, MTH 351 and programming experience
MTH 552. NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of initial-value problems using Runge-Kutta methods and linear multistep methods; introduction to boundary-value problems. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: Programming experience and (MTH 256 or MTH 256H) and (MTH 306 or MTH 306H or MTH 341) and (MTH 351 or MTH 451 or MTH 551)

MTH 553. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of boundary value problems and initial-boundary value problems using finite difference and finite element methods. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 452 or MTH 552

MTH 563. PROBABILITY I. (3 Credits)
An introduction to probability theory; topics covered include: the axioms of probability, probability spaces and models, independence, random variables; densities, distributions, expectation, and variance; probability inequalities, the law of large numbers, and the binomial central limit theorem. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 312

MTH 564. PROBABILITY II. (3 Credits)
Transformations of random variables; sums of independent random variables, generating functions, characteristic functions, the central limit theorem and other weak limit theorems. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 341 and (MTH 463 or MTH 563)

MTH 565. PROBABILITY III. (3 Credits)
Random variables, central limit theorem; distributions of standard statistics; Markov chains, continuous and discontinuous stochastic processes. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 464 or MTH 564

MTH 567. ACTUARIAL MATHEMATICS. (3 Credits)
Foundations of actuarial science from the point of view of mathematical models that arise in the design and management of insurance systems. Most models will be life insurance based. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: (MTH 463 or MTH 563) or ST 421.

MTH 578. PROBABILITY AND DATA ANALYSIS IN K-8 MATHEMATICS. (3 Credits)
Key ideas and topics in probability, data analysis, and statistics critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Equivalent to: MTH 680
Recommended: MTH 390

MTH 590. TOPICS IN SECONDARY MATHEMATICS. (3 Credits)
Key ideas and topics in discrete mathematics critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 341

MTH 591. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Ordered fields, number systems (natural, integer, rational, real, and complex), fundamental theorems of arithmetic and algebra, algebraic and transcendental numbers, constructible points and numbers and the classical geometric constructions, Polya's problem solving heuristics and strategies. Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 491 or MTH 591

MTH 593. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Geometric transformations as real, complex, and matrix functions, invariants and genealogy of geometric transformations, extensions to transformations of the sphere and of three-dimensional space, selected applications chosen from fractals, analysis of frieze and crystallographic patterns, problem solving, groups of symmetries, computer graphics, and the use of dynamic geometry software. Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: MTH 492 or MTH 592

MTH 581. APPLIED ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Linear and nonlinear systems of ordinary differential equations, elementary stability theory, higher order equations, boundary value problems, series solution of ordinary differential equations. All courses used to satisfy MTH prerequisites must be completed with C or better. 
Recommended: (MTH 256 or MTH 256H) and (((MTH 253 or MTH 253H) and MTH 341) or (MTH 306 or MTH 306H))
MTH 594. NUMBER SYSTEMS AND OPERATIONS IN SECONDARY MATHEMATICS. (3 Credits)
Key ideas and topics in number systems, operations, place value, and algorithms critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 681
Recommended: MTH 390

MTH 598. PROBABILITY AND DATA ANALYSIS IN SECONDARY MATHEMATICS. (3 Credits)
Key ideas and topics in probability, data analysis, and statistics critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 685
Recommended: MTH 390

MTH 599. SPECIAL TOPICS. (0-16 Credits)
Topics may vary.
This course is repeatable for 18 credits.

MTH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 603. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

MTH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 606. SPECIAL PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

MTH 607. SEMINAR. (1-16 Credits)
This course is repeatable for 99 credits.

MTH 611. COMPLEX ANALYSIS. (3 Credits)
Basic theory of analytic functions of a complex variable, including Cauchy's theorem, residue theorem, analytic continuation, conformal mappings, entire, and meromorphic functions. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 411 or MTH 511

MTH 612. COMPLEX ANALYSIS. (3 Credits)
Basic theory of analytic functions of a complex variable, including Cauchy's theorem, residue theorem, analytic continuation, conformal mappings, entire, and meromorphic functions. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 611

MTH 614. FUNCTIONAL ANALYSIS. (3 Credits)
Topological vector spaces, generalized functions, operator theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 513

MTH 619. TOPICS IN ANALYSIS. (1-12 Credits)
Equivalent to: MTH 620
This course is repeatable for 12 credits.

MTH 621. PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. Square summable function methods and integral equations. This course is the first in a year-long sequence of MTH 621, MTH 622, MTH 623. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 529
This course is repeatable for 6 credits.
Recommended: 6 credits of senior-level analysis

MTH 622. PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. Square summable function methods and integral equations. This course is the first in a year-long sequence of MTH 621, MTH 622, MTH 623. All courses used to satisfy MTH prerequisites must be completed with C or better.
Prerequisites: MTH 621 with C or better
Equivalent to: MTH 530
This course is repeatable for 6 credits.

MTH 623. PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. Square summable function methods and integral equations. This course is the first in a year-long sequence. All courses used to satisfy MTH prerequisites must be completed with C or better.
Prerequisites: MTH 621 with C or better and MTH 622 [C]
Equivalent to: MTH 531
This course is repeatable for 6 credits.

MTH 627. ADVANCED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Advanced theory including existence proofs and distributional approach. Normally offered fall term in odd years. All courses used to satisfy MTH prerequisites must be completed with C or better.
This course is repeatable for 6 credits.
Recommended: MTH 413 or MTH 513

MTH 628. ADVANCED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Advanced theory including existence proofs and distributional approach. Normally offered winter term in even years. All courses used to satisfy MTH prerequisites must be completed with C or better.
This course is repeatable for 6 credits.
Recommended: MTH 627

MTH 634. ALGEBRAIC TOPOLOGY. (3 Credits)
Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 532

MTH 635. ALGEBRAIC TOPOLOGY. (3 Credits)
Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 532 and MTH 634
MTH 636. ALGEBRAIC TOPOLOGY. (3 Credits)
Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 532 and MTH 635

MTH 644. ABSTRACT ALGEBRA I. (3 Credits)
Group theory, rings and fields, Galois theory. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 544
Recommended: MTH 443 or MTH 543

MTH 645. ABSTRACT ALGEBRA II. (3 Credits)
Group theory, rings and fields, Galois theory. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 545
Recommended: MTH 644

MTH 649. TOPICS IN ALGEBRA AND NUMBER THEORY. (3 Credits)
This course is repeatable for 27 credits.

MTH 654. NUMERICAL ANALYSIS. (3 Credits)
Advanced topics in numerical analysis, such as finite volume methods and finite element methods for partial differential equations, numerical methods for inverse problems, and image processing. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 554
This course is repeatable for 12 credits.
Recommended: Familiarity with numerical methods

MTH 655. NUMERICAL ANALYSIS. (3 Credits)
Advanced topics in numerical analysis, such as finite volume methods and finite element methods for partial differential equations, numerical methods for inverse problems, and image processing. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 555
This course is repeatable for 12 credits.
Recommended: Familiarity with numerical methods

MTH 656. NUMERICAL ANALYSIS. (3 Credits)
Advanced topics in numerical analysis, such as finite volume methods and finite element methods for partial differential equations, numerical methods for inverse problems, and image processing. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 556
This course is repeatable for 12 credits.
Recommended: Familiarity with numerical methods

MTH 657. TOPICS IN APPLIED MATHEMATICS. (1-12 Credits)
Previous topics have included turbulence, financial mathematics and probability methods in partial differential equations.
Equivalent to: MTH 629
This course is repeatable for 12 credits.

MTH 658. TOPICS IN MATHEMATICAL MODELING. (1-12 Credits)
Mathematical treatment of topics of current interest in the physical and biological sciences and technology. May be repeated for credit when topic varies.
Equivalent to: MTH 559
This course is repeatable for 12 credits.

MTH 659. TOPICS IN NUMERICAL ANALYSIS. (1-12 Credits)
This course is repeatable for 12 credits.

MTH 664. PROBABILITY THEORY. (3 Credits)
General theory of probability measures and random variables, including weak convergence, characteristic functions, central limit theory, conditional expectations, martingales. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: CH 574
Recommended: MTH 411 or MTH 511

MTH 665. PROBABILITY THEORY. (3 Credits)
General theory of probability measures and random variables, including weak convergence, characteristic functions, the central limit theorem, and the Brownian motion process. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 575
Recommended: MTH 664

MTH 669. TOPICS IN STOCHASTIC PROCESSES. (1-12 Credits)
Previous topics have included Markov processes, martingales, branching processes, and stochastic differential equations.
This course is repeatable for 12 credits.

MTH 674. DIFFERENTIAL GEOMETRY OF MANIFOLDS. (3 Credits)
Differentiable manifolds, tangent bundles, vector fields and flows, submanifolds, Riemannian metrics, differential forms, integration on manifolds. Selected topics such as foliations, Lie groups, and de Rham cohomology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 637
Recommended: MTH 541 and (MTH 411 or MTH 511)

MTH 675. DIFFERENTIAL GEOMETRY OF MANIFOLDS. (3 Credits)
Differentiable manifolds, connections in linear bundles, Riemannian manifolds and submanifolds. Selected topics such as variational theory of geodesics, harmonic forms, and characteristic classes. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 638
Recommended: MTH 674

MTH 676. TOPICS IN TOPOLOGY. (3 Credits)
Equivalent to: MTH 539
This course is repeatable for 27 credits.

MTH 679. TOPICS IN GEOMETRY. (1-12 Credits)
This course is repeatable for 12 credits.

MTH 680. MODERN APPROACHES TO CALCULUS. (3 Credits)
Alternative approaches to calculus instruction based on the availability of computers and calculators. Applications of symbolic-graphical calculators, spreadsheets, symbolic algebra systems, and graphics packages to the teaching of calculus. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 590
Recommended: MTH 253

MTH 682. TEACHING AND LEARNING PROBABILITY AND STATISTICS. (3 Credits)
Experimental, activity-based approaches to introductory probability and statistics are explored. Topics include computer simulations, exploratory data analysis, misuses of statistics, and misconceptions of probability. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 595
MTH 684. COMPUTERS AND MATHEMATICS. (3 Credits)
A variety of mathematical problems are investigated with a laboratory approach using microcomputers and a wide variety of software. Problems may be taken from number theory, calculus, geometry, probability, and elementary numerical analysis. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 597
Recommended: Ability to program in either BASIC or PASCAL

MTH 685. ADVANCED PROBLEM SOLVING. (3 Credits)
Mathematical problem solving using the heuristic approach of George Polya. Problems may be taken from a variety of areas, including number theory, calculus, geometry, probability, and elementary numerical analysis. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 598

MTH 689. TOPICS IN MATHEMATICS EDUCATION. (1-12 Credits)
Topics may vary.
Equivalent to: MTH 599
This course is repeatable for 12 credits.

MTH 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Actuarial Science Minor

Minor Code: 563

A minimum GPA of 2.0 is required in this minor. No course used to fulfill requirements for this minor may be taken S/U.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 253</td>
<td>INFINITE SERIES AND SEQUENCES</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 264</td>
<td>INTRODUCTION TO MATRIX ALGEBRA</td>
<td></td>
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<tr>
<td>&amp; MTH 265</td>
<td>and INTRODUCTION TO SERIES</td>
<td></td>
</tr>
<tr>
<td>or MTH 306</td>
<td>MATRIX AND POWER SERIES METHODS</td>
<td></td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 361</td>
<td>INTRODUCTION TO PROBABILITY</td>
<td>3</td>
</tr>
<tr>
<td>Select at least two upper division courses from the following:</td>
<td></td>
<td>6-8</td>
</tr>
<tr>
<td>MTH 351</td>
<td>INTRODUCTION TO NUMERICAL ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>MTH 463</td>
<td>PROBABILITY I</td>
<td></td>
</tr>
<tr>
<td>MTH 464</td>
<td>PROBABILITY II</td>
<td></td>
</tr>
<tr>
<td>MTH 465</td>
<td>PROBABILITY III</td>
<td></td>
</tr>
<tr>
<td>MTH 467</td>
<td>ACTUARIAL MATHEMATICS</td>
<td></td>
</tr>
<tr>
<td>ST 411</td>
<td>METHODS OF DATA ANALYSIS</td>
<td></td>
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<tr>
<td>ST 412</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>ST 413</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>ST 421</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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<tr>
<td>ST 422</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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<tr>
<td>ST 441</td>
<td>PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS</td>
<td></td>
</tr>
<tr>
<td>ST 443</td>
<td>APPLIED STOCHASTIC MODELS</td>
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</tr>
</tbody>
</table>

Total Hours | 28-30

* Baccalaureate Core Course (BCC)

The Actuarial Science minor must include 28 credits, at least 12 of which must be upper-division credits.

Mathematics Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Actuarial science, algebra, analysis, applied mathematics, computational mathematics, differential equations, financial mathematics, geometry, mathematical biology, mathematics education, number theory, numerical analysis, topology, probability

The Department of Mathematics offers graduate work leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees. Graduate areas of concentration are actuarial science, algebra, analysis, applied mathematics, computational mathematics, differential equations, financial mathematics, geometry, mathematical biology, mathematics education, number theory, numerical analysis, topology, probability.

For the MS and MA, a thesis, an expository paper, or successful completion of the PhD qualifying examination is required.

Major Code: 5600

Mathematics Graduate Minor

Minor Code: 5600

Mathematics Minor

Minor Code: 560

A minimum GPA of 2.0 is required in this minor. No course used to fulfill requirements for this minor may be taken S/U.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Required</td>
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<tr>
<td>MTH courses numbered 231 or higher</td>
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<td>30</td>
</tr>
<tr>
<td>MTH courses numbered 311 or higher (15 credits)</td>
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<td></td>
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<tr>
<td>MTH 311</td>
<td>ADVANCED CALCULUS</td>
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<tr>
<td>or MTH 341</td>
<td>LINEAR ALGEBRA I</td>
<td></td>
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<tr>
<td>Strongly Recommended</td>
<td>1</td>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours | 30

* Baccalaureate Core Course (BCC)

1 MTH 390 may not be used for credit in the Mathematics minor

Minor Code: 560
Mathematics Undergraduate Major
(BS, HBS)

The BS degree in Mathematics requires a common core of courses at the lower-division level and junior-level followed by senior-level depth and breadth requirements. The upper-division requirements in the major total 45–50 credits. Thus, a mathematics major has ample opportunity to take further mathematics courses focused toward specific interests and career goals. Programs supporting interdisciplinary interests are strongly encouraged.

Major Code: 560

The following requirements are specific to the BS degree in Mathematics. Students must also satisfy OSU degree and baccalaureate core requirements.

A grade of at least C– and a GPA of 2.25 are required in all mathematics courses used to fulfill degree requirements. No course used to fulfill requirements for the mathematics major or any of its options may be taken S/U.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 251</td>
<td>DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 253</td>
<td>INFINITE SERIES AND SEQUENCES</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 255</td>
<td>VECTOR CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
</tbody>
</table>

Upper-Division Requirements:

Part A: Required Mathematics Core Classes

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>MTH 311</td>
<td>ADVANCED CALCULUS</td>
<td>8</td>
</tr>
<tr>
<td>MTH 312</td>
<td>and ADVANCED CALCULUS</td>
<td>8</td>
</tr>
<tr>
<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 342</td>
<td>LINEAR ALGEBRA II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 343</td>
<td>INTRODUCTION TO MODERN ALGEBRA</td>
<td>3</td>
</tr>
<tr>
<td>MTH 355</td>
<td>DISCRETE MATHEMATICS</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following writing intensive courses (WIC):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MTH 323</td>
<td>*MATHEMATICAL MODELING</td>
<td>3</td>
</tr>
<tr>
<td>MTH 332</td>
<td>*FUNDAMENTAL CONCEPTS OF TOPOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 338</td>
<td>*NON-EUCLIDEAN GEOMETRY</td>
<td>3</td>
</tr>
</tbody>
</table>

Part B: Computational Requirement

Select one of the following (can be used to satisfy one requirement in either Part C or Part D):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 321</td>
<td>INTRODUCTORY APPLICATIONS OF MATHEMATICAL SOFTWARE</td>
<td>3</td>
</tr>
<tr>
<td>MTH 351</td>
<td>INTRODUCTION TO NUMERICAL ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>MTH 440</td>
<td>COMPUTATIONAL NUMBER THEORY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 441</td>
<td>APPLIED AND COMPUTATIONAL ALGEBRA</td>
<td>3</td>
</tr>
<tr>
<td>MTH 451</td>
<td>NUMERICAL LINEAR ALGEBRA</td>
<td>3</td>
</tr>
<tr>
<td>MTH 452</td>
<td>NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS</td>
<td>3</td>
</tr>
</tbody>
</table>

Part C: Area Course Work

Select 15 credits from the following six areas:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 440</td>
<td>COMPUTATIONAL NUMBER THEORY</td>
</tr>
<tr>
<td>MTH 441</td>
<td>APPLIED AND COMPUTATIONAL ALGEBRA</td>
</tr>
<tr>
<td>MTH 442</td>
<td>APPLIED AND COMPUTATIONAL ALGEBRA</td>
</tr>
<tr>
<td>MTH 443</td>
<td>ABSTRACT LINEAR ALGEBRA (cannot be used in a pair to satisfy (a))</td>
</tr>
</tbody>
</table>

Analysis

Applied and Computational Mathematics Option

This option is offered within the following major(s):

- Mathematics - College of Science (p. 963)

The Applied and Computational option offers Mathematics majors an opportunity to concentrate much of their upper-division course work in the area of applied and computational mathematics. This degree option is designed to allow students to focus on applied mathematics, modeling, and computation after completing core junior and lower-division mathematics requirements.
Option Code: 692

A grade of at least C– and a GPA of 2.25 are required in all mathematics courses used to fulfill degree requirements. No course used to fulfill requirements for the mathematics major or any of its options may be taken S/U.

The lower-division requirements for the Applied and Computational Mathematics option are the same as those for the Mathematics BS degree. The upper-division requirements are as follows.

### Upper-Division Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>
| Part A: Required Applied and Computational Mathematics Core Classes
  | MTH 311  | ADVANCED CALCULUS                  | 4     |
  | MTH 312  | and ADVANCED CALCULUS              | 4     |
  | MTH 323  | *MATHEMATICAL MODELING              | 3     |
  | MTH 341 | LINEAR ALGEBRA I                   | 3     |
  | MTH 342 | LINEAR ALGEBRA II                  | 4     |
  | MTH 343 | INTRODUCTION TO MODERN ALGEBRA     | 3     |
  | MTH 355 | DISCRETE MATHEMATICS               | 3     |
  | MTH 483 | COMPLEX VARIABLES                  | 3     |
| Part B: Area Course Work
  | Select five of the following: 1   | 15    |
  | MTH 420 | MODELS AND METHODS OF APPLIED MATHEMATICS |   |
  | MTH 440 | COMPUTATIONAL NUMBER THEORY        |       |
  | MTH 441 | APPLIED AND COMPUTATIONAL ALGEBRA   |       |
  | MTH 451 | NUMERICAL LINEAR ALGEBRA           |       |
  | MTH 452 | NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS |       |
  | MTH 453 | NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS |       |
  | MTH 480 | SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS |       |
  | MTH 481 | APPLIED ORDINARY DIFFERENTIAL EQUATIONS |       |
  | MTH 482 | APPLIED PARTIAL DIFFERENTIAL EQUATIONS |       |
| Part C: Probability or Statistics
  | Select one of the following: 3-4  |       |
  | MTH 361 | INTRODUCTION TO PROBABILITY        |       |
  | MTH 463 | PROBABILITY I                      |       |
  | ST 351  | INTRODUCTION TO STATISTICAL METHODS |       |
  | ST 421  | INTRODUCTION TO MATHEMATICAL STATISTICS |       |
| Part D: Electives
  | Select two additional upper-division elective courses of a mathematical nature 2 | 6     |

Total Hours: 51-52

1. Either MTH 453 or MTH 482 must be included. *(Note: Only one of MTH 480 and MTH 481 can be used to satisfy requirements for a degree in Mathematics.)*

2. This includes non-blanket numbered (not X99- or X0X-numbered) upper-division MTH courses, upper-division ST courses, or other courses of a mathematical nature approved by the departmental head advisor. MTH 390 is not allowed.

^ Writing Intensive Course (WIC)

Option Code: 737

A grade of at least C– and a GPA of 2.25 are required in all mathematics courses used to fulfill degree requirements. No course used to fulfill requirements for the mathematics major or any of its options may be taken S/U.

### Upper-Division Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
</table>
| Part A: Required Mathematics Core Courses
  | MTH 311  | ADVANCED CALCULUS                  | 4     |
  | MTH 312 | ADVANCED CALCULUS                  | 4     |
  | MTH 341 | LINEAR ALGEBRA I                   | 3     |
  | MTH 342 | LINEAR ALGEBRA II                  | 4     |
  | MTH 343 | INTRODUCTION TO MODERN ALGEBRA     | 3     |
  | MTH 355 | DISCRETE MATHEMATICS               | 3     |
| Part B: Area Course Work in Mathematics and Statistics
  | MTH 427 | INTRODUCTION TO MATHEMATICAL BIOLOGY | 3     |
  | MTH 428 | STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY | 3     |
  | MTH 463 | PROBABILITY I                      | 3     |
  | MTH 480 | SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS | 3     |
| Part C: Directed Electives
  | Select one of the following: 4 | |
  | ST 351  | INTRODUCTION TO STATISTICAL METHODS |       |
  | ST 411  | METHODS OF DATA ANALYSIS           |       |
| Part D: Electives
  | Select one of the following: 3 |       |
  | MTH 351 | INTRODUCTION TO NUMERICAL ANALYSIS |       |
  | MTH 352 | NUMERICAL LINEAR ALGEBRA           |       |
  | MTH 482 | APPLIED PARTIAL DIFFERENTIAL EQUATIONS |       |
| Part E: Required Area Course Work in Life Science
  | BI 211 | *PRINCIPLES OF BIOLOGY              | 4     |
  | BI 212 | *PRINCIPLES OF BIOLOGY              | 4     |
  | BI 213 | *PRINCIPLES OF BIOLOGY              | 4     |
  | MTH 251 | *DIFFERENTIAL CALCULUS             | 4     |
  | MTH 252 | INTEGRAL CALCULUS                  | 4     |
  | MTH 253 | INFINITE SERIES AND SEQUENCES      | 4     |
  | MTH 254 | VECTOR CALCULUS I                  | 4     |
  | MTH 255 | VECTOR CALCULUS II                 | 4     |
  | MTH 256 | APPLIED DIFFERENTIAL EQUATIONS     | 4     |
  | CH 231 | GENERAL CHEMISTRY                  | 5     |
  | & CH 261 | and *LABORATORY FOR CHEMISTRY 231 |       |

Option Code: 692

### Mathematical Biology Option

This option is offered within the following major(s):

- Mathematics - College of Science (p. 963)

In addition to the usual required lower-division mathematics courses and the junior core courses, mathematics majors in the Mathematical Biology option have an opportunity to concentrate much of their further course work on applied mathematics, mathematical biology, modeling and computation.

### Lower-Division Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 253</td>
<td>INFINITE SERIES AND SEQUENCES</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 255</td>
<td>VECTOR CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
<td></td>
</tr>
</tbody>
</table>

^ Writing Intensive Course (WIC)
## Secondary Teaching Emphasis Option

This option is offered within the following major(s):

- Mathematics - College of Science (p. 963)

Students preparing for careers teaching mathematics at the secondary level may major in mathematics with the following transcript-visible option. This option helps prepare students to pursue a teaching licensure program in their fifth year.

### Option Code: 737

**Secondary Teaching Emphasis Option**

A grade of at least C– and a GPA of 2.25 are required in all mathematics courses used to fulfill degree requirements. No course used to fulfill requirements for the mathematics major or any of its options may be taken S/U.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 253</td>
<td>INFINITE SERIES AND SEQUENCES</td>
<td>4</td>
</tr>
<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>Baccalaureate core courses</td>
<td></td>
<td>29</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 255</td>
<td>VECTOR CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
<td>3</td>
</tr>
<tr>
<td>Baccalaureate core courses</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Other electives</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>93-94</td>
</tr>
</tbody>
</table>

### Statistics Option

This option is offered within the following major(s):

- Mathematics - College of Science (p. 963)

The Statistics option offers Mathematics majors an opportunity to concentrate their senior level course work in the area of statistics and probability after completing core junior and lower-division mathematics requirements. This degree option is designed to allow a focus on the study of the mathematical theory underlying statistics while simultaneously developing expertise in statistical applications.

### Option Code: 234

**Statistics Option**

A grade of at least C– and a GPA of 2.25 are required in all mathematics courses used to fulfill degree requirements. No course used to fulfill requirements for the mathematics major or any of its options may be taken S/U.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 311 &amp; MTH 312</td>
<td>ADVANCED CALCULUS and ADVANCED CALCULUS</td>
<td>8</td>
</tr>
<tr>
<td>MTH 338</td>
<td>*NON-EUCLIDEAN GEOMETRY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 342</td>
<td>LINEAR ALGEBRA II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 343</td>
<td>INTRODUCTION TO MODERN ALGEBRA</td>
<td>3</td>
</tr>
<tr>
<td>MTH 355</td>
<td>DISCRETE MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>MTH 361</td>
<td>INTRODUCTION TO PROBABILITY</td>
<td>3</td>
</tr>
<tr>
<td>Baccalaureate core courses</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Other electives</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>

### Upper-Division Requirements

#### Part A. Required Mathematics Core Classes

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 311 &amp; MTH 312</td>
<td>ADVANCED CALCULUS and ADVANCED CALCULUS</td>
<td>8</td>
</tr>
<tr>
<td>MTH 341 &amp; MTH 342</td>
<td>LINEAR ALGEBRA I and LINEAR ALGEBRA II</td>
<td>3</td>
</tr>
<tr>
<td>MTH 343</td>
<td>INTRODUCTION TO MODERN ALGEBRA</td>
<td>4</td>
</tr>
<tr>
<td>MTH 355</td>
<td>DISCRETE MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>MTH 361</td>
<td>INTRODUCTION TO PROBABILITY</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following writing intensive courses (WIC):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 323</td>
<td>*MATHEMATICAL MODELING</td>
<td>3</td>
</tr>
<tr>
<td>MTH 333</td>
<td>*FUNDAMENTAL CONCEPTS OF TOPOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 338</td>
<td>*NON-EUCLIDEAN GEOMETRY</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Part B. Statistics and Probability Core Classes

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 463</td>
<td>PROBABILITY I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 464</td>
<td>PROBABILITY II</td>
<td>3</td>
</tr>
</tbody>
</table>
Physics

Physics is the study of the fundamental structure of matter and the interactions of its constituents. Physicists are concerned with the development of concepts needed for a precise description of nature and with experiments to test such concepts.

For students of science and engineering, the study of physics provides the basic foundation needed to understand the complex workings of the material world, from the forces that build atoms to those that build bridges. For students of the liberal arts, the study of physics provides an introduction to modern ideas about the most fundamental and elemental aspects of nature and how those ideas developed in their cultural and historical context. Physics is a basic and indispensable tool in all technical fields, and its development figures prominently in any discussion of the intellectual history of our civilization.

Undergraduate Degree Programs

The department offers several programs leading to degrees in physics. A basic physics curriculum in the College of Science stresses the detailed and advanced preparation needed for graduate work or employment in physics.

Options are available within the physics degree program that prepare students for graduate work or employment in an allied field, such as applied physics, biophysics, chemical physics, geophysics, mathematical physics, optical physics, and physics teaching.

Other programs are offered that train students for careers in physics teaching. A Physics minor is available for students majoring in other areas of science and engineering.

The Department of Physics offers the upper-division curriculum, Paradigms in Physics. Many of the junior-year courses are taught in 2-credit intensive modules, meeting seven hours a week for about three weeks.

Graduate Degrees

Graduate programs leading to the MA, MS, and PhD are offered, emphasizing theoretical or experimental studies in the areas of atomic physics, computational physics, nuclear physics, optical physics, particle physics, and solid state physics. The MS degree has both thesis and nonthesis options. Comprehensive written and oral examinations must be passed before the student can become a candidate for an advanced degree.

Careers

A multitude of opportunities exists for students who complete undergraduate degrees in physics. They include employment in technological industries, including electronics, computers, optics, materials science, and aerospace; graduate study leading to an advanced degree in physics or a related area such as mathematics, Earth sciences, computer science, engineering, or astronomy; and degree programs leading to professions such as law or medicine, with specialties in areas in which a physics background is essential.

Preparation

Recommended high school preparation for students who plan to major in physics includes one year each of chemistry and physics and four years of mathematics through analytic geometry. Mathematics preparation is especially important; students who are not ready to start calculus (MTH 251) upon entering may be delayed in their progress toward a degree. Students anticipating transfer to OSU from another institution are encouraged to contact the Department of Physics as early as possible to discuss their placement in the course curricula.

Advising

Each undergraduate student is assigned an advisor who helps select the most appropriate degree program and assists in planning the curriculum. Minor variations in the requirements for degrees are possible, but must be discussed with the advisor and approved at an early stage in curriculum planning. Near the end of the degree program, the advisor can help the student to apply for employment or admission to graduate programs.
Options

Students desiring to combine the study of physics with that of another related subject should consider the options below, or should consult with a Department of Physics advisor about substituting upper-division work in a related field for certain of the upper-division physics requirements. All such substitutions must constitute a coherent program in related areas and must be approved in advance by the Department of Physics. In each case, the program must include at least 3 credits of PH 403 to satisfy the university’s writing intensive course (WIC) requirements.

Astronomy

The Department of Physics offers an introductory course, PH 104. Three online courses (PH 205, PH 206, PH 207) and several on-campus special topics courses also are offered. Students who desire careers in astronomy can design a curriculum under the Geophysics option, which includes related course work in geology and in atmospheric sciences. This curriculum would qualify the student for graduate work in astronomy.

All undergraduate students must satisfy the university requirements for graduation (see OSU Baccalaureate Core (p. 1614) in this Catalog) and the college requirements (see the College of Science (p. 933) section).

Grades of C– or better must be attained in all courses required for the Physics major. Courses in which a lower grade is received must be repeated until a satisfactory grade is received.

Undergraduate Programs

Major

- Physics (p. 974)
  Options:
  - Applied Physics
  - Biological Physics
  - Chemical Physics
  - Computational Physics
  - Geophysics
  - Mathematical Physics
  - Optical Physics
  - Physics Teaching/Physics

Minor

- Physics (p. 973)

Graduate Programs

Majors

- Physics (p. 973)

Minor

- Physics (p. 973)

Heidi Schellman, Head
301 Weniger Hall
Oregon State University
Corvallis, OR 97331-6507
Phone: 541-737-4631
Email: heidi.schellman@oregonstate.edu
Website: http://www.physics.oregonstate.edu/

Faculty

Professors Jansen, Lee, Manogue, McIntyre, Schellman, Tate
Associate Professors Giebultowicz, Lazzati, Minot, Ostroverkhova, Roundy, Schneider
Assistant Professors Gire, Graham, Qiu, Sun
Instructor Bannon, Coffin, Hadley, Ketter, Milstein, Walsh

Adjunct Faculty

Herman, Keszler, Kornilovich

Physics

PH 104. *DESCRIPTIVE ASTRONOMY. (4 Credits)
Historical and cultural context of discoveries concerning planets and stars and their motions. Topics include the solar system, the constellations, birth and death of stars, pulsars and black holes. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 104H

PH 104H. *DESCRIPTIVE ASTRONOMY. (4 Credits)
Historical and cultural context of discoveries concerning planets and stars and their motions. Topics include the solar system, the constellations, birth and death of stars, pulsars and black holes. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course
Designator Equivalent to: PH 104

PH 106. *PERSPECTIVES IN PHYSICS. (4 Credits)
A descriptive and non-mathematical study of the development of physical concepts and their historical and philosophical context. The emphasis is on the origin, meaning, significance, and limitations of these concepts and their role in the evolution of current understanding of the universe. Concepts to be covered include Copernican astronomy, Newtonian mechanics, energy, electricity and magnetism, relativity, and quantum theory. Intended primarily for non-science students. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 111. *INQUIRING INTO PHYSICAL PHENOMENA. (4 Credits)
Development of conceptual understandings through investigation of everyday phenomena. Emphasis is on questioning, predicting, exploring, observing, discussing, and writing in physical science contexts. Students document their initial thinking, record their evolving understandings, and write reflections upon how their thinking changed and what fostered their learning. Lec/lab. (Baccalaureate Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 198. FIRST-YEAR ORIENTATION. (1 Credit)
Introduction to the Physics Department including educational, research, and career opportunities. Recommended for all freshman and transfer physics majors, but open to all students interested in learning about opportunities in Physics.

PH 199. SPECIAL STUDIES. (1-16 Credits)
One-credit sections are graded pass/no pass.
This course is repeatable for 99 credits.
PH 201. *GENERAL PHYSICS. (5 Credits)
Introductory survey course covering a broad spectrum of classical and modern physics with applications. Topics include dynamics, vibrations and waves, electricity and magnetism, optics, and modern physics. Laboratory and recitation sections accompany the lectures. Mathematical preparation should include college algebra and trigonometry. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 201H
Recommended: MTH 111 and MTH 112

PH 202. *GENERAL PHYSICS. (5 Credits)
Introductory survey course covering broad spectrum of classical and modern physics with applications. Topics include dynamics, vibrations and waves, electricity and magnetism, optics, and modern physics. Laboratory and recitation sections accompany the lectures. Mathematical preparation should include college algebra and trigonometry. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 202H
Recommended: MTH 111 and MTH 112 and PH 201

PH 203. *GENERAL PHYSICS. (5 Credits)
Introductory survey course covering broad spectrum of classical and modern physics with applications. Topics include dynamics, vibrations and waves, electricity and magnetism, optics, and modern physics. Laboratory and recitation sections accompany the lectures. Mathematical preparation should include college algebra and trigonometry. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 203H
Recommended: MTH 111 and MTH 112 and PH 202

PH 205. *SOLAR SYSTEM ASTRONOMY. (4 Credits)
History, laws, and tools of astronomy. Composition, motion, and origin of the sun, planets, moons, asteroids, and comets. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. The courses in the astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 206. *STARS AND STELLAR EVOLUTION. (4 Credits)
Properties of stars; star formation, evolution, and death; supernovae, pulsars, and black holes. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. The courses in the astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 207. *GALAXIES, QUASARS, AND COSMOLOGY. (4 Credits)
Nature and content of galaxies, properties of quasars, and the cosmic background radiation. Emphasis on the Big-Bang model and its features. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. The courses in the astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 211. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 211H
Recommended: MTH 251 and concurrent enrollment in MTH 252 and a PH 221 recitation section

PH 211H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Equivalent to: PH 211
Recommended: MTH 251 and concurrent enrollment in MTH 252 and a PH 211 recitation section

PH 212. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: PH 211 with D- or better or PH 211H with D- or better
Equivalent to: PH 212H, PH 212H
Recommended: MTH 252 and concurrent enrollment in PH 222 and MTH 254

PH 212H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: PH 211 with D- or better or PH 211H with D- or better
Equivalent to: PH 212
Recommended: MTH 252 and concurrent enrollment in PH 222 and MTH 254

PH 213. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 213H
Recommended: MTH 254 and (PH 212 or PH 212H). Concurrent enrollment in a recitation section is strongly recommended.
PH 213H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Equivalent to: PH 213
Recommended: MTH 254 and (PH 212 or PH 212H). Concurrent enrollment in a recitation section is strongly recommended.

PH 221. RECITATION FOR PHYSICS 211. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Prerequisites: PH 211 (may be taken concurrently) with D- or better or PH 211H (may be taken concurrently) with D- or better
Equivalent to: PH 221H
PH 221H. RECITATION FOR PHYSICS 211. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 211 (may be taken concurrently) with D- or better or PH 211H (may be taken concurrently) with D- or better
Equivalent to: PH 221

PH 222. RECITATION FOR PHYSICS 212. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Graded P/N.
Prerequisites: PH 212 (may be taken concurrently) with D- or better or PH 212H (may be taken concurrently) with D- or better
Equivalent to: PH 222H
PH 222H. RECITATION FOR PHYSICS 212. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 212 (may be taken concurrently) with D- or better or PH 212H (may be taken concurrently) with D- or better
Equivalent to: PH 222
Recommended: Concurrent enrollment in PH 212 or PH 212H

PH 223. RECITATION FOR PHYSICS 213. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Prerequisites: PH 213 (may be taken concurrently) with D- or better or PH 213H (may be taken concurrently) with D- or better
Equivalent to: PH 223H
PH 223H. RECITATION FOR PHYSICS 213. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 213 (may be taken concurrently) with D- or better or PH 213H (may be taken concurrently) with D- or better
Equivalent to: PH 223
Recommended: Concurrent enrollment in PH 213

PH 265. SCIENTIFIC COMPUTING. (3 Credits)
Basic computational tools and techniques for courses in science and engineering. Project approach to problem solving using symbolic and compiled languages with visualization. Basic computer literacy assumed.
Equivalent to: CS 265
Recommended: Concurrent enrollment in MTH 251

PH 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PH 313. *ENERGY ALTERNATIVES. (3 Credits)
Exploration of the challenges and opportunities posed by dwindling resources; physical and technological basis of our current energy alternatives; new or controversial technologies such as nuclear or solar power; overview of resource availability, patterns of energy consumption, and current governmental policies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: PH 313H
Recommended: Upper-division standing and 12 credits of introductory science.

PH 313H. *ENERGY ALTERNATIVES. (3 Credits)
Exploration of the challenges and opportunities posed by dwindling resources; physical and technological basis of our current energy alternatives; new or controversial technologies such as nuclear or solar power; overview of resource availability, patterns of energy consumption, and current governmental policies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: PH 313

PH 315. PHYSICS OF CONTEMPORARY CHALLENGES. (3 Credits)
An introduction to thermal and quantum physics in the context of contemporary challenges faced by our society, such as power generation, energy efficiency, and global warming.
Recommended: PH 211

PH 317. *EXPERIMENTAL PHYSICS. (3 Credits)
Conducting experiments, understanding equipment, modeling physical phenomena, analyzing and presenting data, sources of variation and uncertainty. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PH 213 with C- or better and PH 315 [C–] and PH 335 [C–]

PH 317X. EXPERIMENTAL PHYSICS. (3 Credits)
Conducting experiments, understanding equipment, modeling physical phenomena, analyzing and presenting data, data-driven conclusions and inferences, statistical analysis.
Prerequisites: PH 213 with C- or better and PH 315 [C–] and PH 335 [C–]

PH 331. *SOUND, HEARING, AND MUSIC. (3 Credits)
Basic course in the physics, technology, and societal implications of sound. Intended for students in nontechnical majors. Topics include wave motion, hearing and the perception of sound, noise pollution, music and musical instruments, architectural acoustics, and sound recording and reproduction. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and one year of university science

PH 332. *LIGHT, VISION, AND COLOR. (3 Credits)
Basic physics of light, optical instruments (lenses, telescopes, microscopes), the eye and visual perception, colors, photography, environmental lighting, lasers and holography. For nontechnical majors. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and one year of university science
PH 335. TECHNIQUES OF THEORETICAL MECHANICS. (3 Credits)
Newtonian, Lagrangian, and Hamiltonian classical mechanics. Special
relativity with relativistic mechanics.
Recommended: PH 212 and MTH 254

PH 365. COMPUTATIONAL PHYSICS LAB. (1 Credit)
A project-driven laboratory experience in computational physics. Includes
the use of basic mathematical and numerical techniques in computer
calculations leading to solutions for typical physical problems. Topics
to be covered will coordinate with the Paradigms in Physics course
sequence.
Prerequisites: PH 213 with C- or better
Equivalent to: PH 365X
Recommended: Concurrent enrollment in Paradigms

PH 366. COMPUTATIONAL PHYSICS LAB. (1 Credit)
A project-driven laboratory experience in computational physics. Includes
the use of basic mathematical and numerical techniques in computer
calculations leading to solutions for typical physical problems. Topics
to be covered will coordinate with the Paradigms in Physics course
sequence.
Prerequisites: PH 213 with C- or better
Recommended: Concurrent enrollment in Paradigms

PH 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: PH 399H
This course is repeatable for 16 credits.

PH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PH 399
This course is repeatable for 16 credits.

PH 401. RESEARCH. (1-16 Credits)
A research project under the supervision of a faculty member, whose
approval must be arranged by the student in advance of registration.
This course is repeatable for 16 credits.

PH 403. *THESIS. (1-16 Credits)
A research project leading to a thesis under the supervision of a faculty
member, whose approval must be arranged by the student in advance of
registration. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

PH 405. READING AND CONFERENCE. (1-16 Credits)
An independent study project under the supervision of a faculty
member, whose approval must be arranged by the student in advance of
registration.
This course is repeatable for 16 credits.

PH 407. SEMINAR. (1-16 Credits)
Departmental seminars or colloquium. Graded P/N.
Equivalent to: PH 407H
This course is repeatable for 16 credits.

PH 407H. SEMINAR. (1-16 Credits)
Departmental seminars or colloquium.
Attributes: HNRS – Honors Course Designator
Equivalent to: PH 407
This course is repeatable for 16 credits.

PH 409. PHYSICS TEACHING PRACTICUM. (1-6 Credits)
Physics practicum experience for students assisting in Physics courses.
Includes training in course content and development of instructional
materials. Admission is by application. See the department office in
Weniger 301 for details.
This course is repeatable for 16 credits.

PH 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

PH 411. ELECTRONICS. (3 Credits)
Covers how to build and analyze basic circuits. Topics include passive
dc and ac circuits including filters, complex impedance, Fourier analysis,
operational amplifiers, semiconductor diodes, and transistors.
Recommended: PH 213

PH 415. COMPUTER INTERFACING AND INSTRUMENTATION. (3 Credits)
Applications of computers as scientific instruments, with emphasis on
hardware and instrumentation, online data acquisition, and computer
control of experiments.
Recommended: Upper-division and PH 412/PH 512 or equivalent
background in electronics

PH 422. PARADIGMS IN PHYSICS: STATIC FIELDS. (3 Credits)
Theory of static electric, magnetic, and gravitational potentials and fields
using the techniques of vector calculus in three dimensions.
Equivalent to: PH 322
Recommended: PH 213 and MTH 255

PH 423. PARADIGMS IN PHYSICS: ENERGY AND ENTROPY. (3 Credits)
Thermodynamics and canonical statistical mechanics.
Equivalent to: PH 323
Recommended: PH 213

PH 424. PARADIGMS IN PHYSICS: OSCILLATIONS AND WAVES. (3
Credits)
Dynamics of mechanical and electrical oscillation using Fourier series
and integrals; time and frequency representations for driven damped
oscillators, resonance; one-dimensional waves in classical mechanics
and electromagnetism; normal modes
Recommended: PH 213 and PH 411 and MTH 256

PH 425. PARADIGMS IN PHYSICS: QUANTUM FUNDAMENTALS. (3
Credits)
Introduction to quantum mechanics through Stern-Gerlach spin
measurements. Probability, eigenvalues, operators, measurement, state
reduction, Dirac notation, matrix mechanics, time evolution. Quantum
behavior of a one-dimensional well.
Recommended: PH 213 and concurrent enrollment in MTH 341

PH 426. PARADIGMS IN PHYSICS: CENTRAL FORCES. (3 Credits)
Gravitational and electrostatic forces; angular momentum and spherical
harmonics, separation of variables in classical and quantum mechanics,
hydrogen atom.
Recommended: PH 213 and PH 422 and PH 425 and concurrent
enrollment in PH 335

PH 427. PARADIGMS IN PHYSICS: PERIODIC SYSTEMS. (3 Credits)
Quantum waves in position and momentum space; Bloch waves in
one-dimensional periodic systems, and the reciprocal lattice; coupled
harmonic oscillators; phonons.
Recommended: PH 424 and PH 425 and concurrent enrollment in PH 315
PH 431. CAPSTONES IN PHYSICS: ELECTROMAGNETISM. (3 Credits)
Static electric and magnetic fields in matter, electrodynamics, Maxwell equations, electromagnetic waves, wave guides, dipole radiation.
Recommended: (PH 424 or 524) and (PH 426 or PH 526)

PH 441. CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS. (3 Credits)
Entropy and quantum mechanics; canonical Gibbs probability; ideal gas; thermal radiation; Einstein and Debye lattices; grand canonical Gibbs probability; ideal Fermi and Bose gases; chemical reactions and phase transformations.
Recommended: (PH 423 or PH 523) and (PH 451 or PH 551)

PH 451. CAPSTONES IN PHYSICS: QUANTUM MECHANICS. (3 Credits)
Wave mechanics, Schroedinger equation, operators, harmonic oscillator, identical particles, atomic fine structure, approximation methods and applications.
Recommended: (PH 424 or PH 524) and (PH 425 or PH 525) and (PH 426 or PH 526)

PH 455. ASTROPHYSICS. (3 Credits)
Physics of stars and the cosmos.
Recommended: PH 213; PH 315 or equivalent junior-level background in modern physics and thermodynamics.

PH 464. SCIENTIFIC COMPUTING II. (3 Credits)
Mathematical, numerical, and conceptual elements forming foundations of scientific computing: computer hardware, algorithms, precision, efficiency, verification, numerical analysis, algorithm scaling, profiling, and tuning.
Equivalent to: PH 365

PH 465. COMPUTATIONAL PHYSICS. (3 Credits)
The use of basic mathematical and numerical techniques in computer calculations leading to solutions for typical physical problems. Topics to be covered include models and applications ranging from classical mechanics and electromagnetism to modern solid state and particle physics.
Recommended: PH 464 or PH 564

PH 481. PHYSICAL OPTICS. (4 Credits)
Wave propagation, polarization, interference, diffraction, and selected topics in modern optics.
Recommended: PH 431 or PH 531

PH 482. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: ECE 482
Recommended: ECE 391 or (PH 481 or PH 581)

PH 483. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Equivalent to: ECE 483
Recommended: Completion or concurrent enrollment in ECE 391 or PH 481

PH 495. INTRODUCTION TO PARTICLE AND NUCLEAR PHYSICS. (3 Credits)
Elementary particles and forces, nuclear structure and reactions.
Recommended: PH 451 or PH 551

PH 499. SPECIAL TOPICS. (1-16 Credits)
Topics vary from year to year. May be repeated for credit. Not offered every year.
This course is repeatable for 16 credits.

PH 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PH 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PH 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PH 507. SEMINAR. (1-16 Credits)
Section 1: Departmental Colloquium. Section 3: Nuclear and Particle Physics. Section 5: Atomic, Molecular, and Optical Physics. Section 7: Solid State Physics. Section 9: Computational Physics. One-credit options are graded P/N.
This course is repeatable for 16 credits.

PH 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

PH 511. ELECTRONICS. (3 Credits)
Covers how to build and analyze basic circuits. Topics include passive dc and ac circuits including filters, complex impedance, Fourier analysis, operational amplifiers, semiconductor diodes, and transistors.
Recommended: PH 213

PH 512. ANALOG AND DIGITAL ELECTRONICS. (3 Credits)
Circuit theory. Passive dc and ac circuits including filters, resonance, complex impedance and Fourier analysis. Operational amplifiers, gates and combinational logic. Semiconductor principles, diodes, transistors, BJTs and FETs. Multiplexing, flip-flops and sequential logic, 555 timer, registers and memory, DAC, ADC.
Recommended: PH 511 and completion or concurrent enrollment in PH 314

PH 515. COMPUTER INTERFACING AND INSTRUMENTATION. (3 Credits)
Applications of computers as scientific instruments, with emphasis on hardware and instrumentation, online data acquisition, and computer control of experiments.
Recommended: PH 412 or PH 512 or equivalent background in electronics

PH 531. CAPSTONES IN PHYSICS: ELECTROMAGNETISM. (3 Credits)
Static electric and magnetic fields in matter, electrodynamics, Maxwell equations, electromagnetic waves, wave guides, dipole radiation.
Recommended: (PH 424 or PH 524) and (PH 426 or PH 526)

PH 541. CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS. (3 Credits)
Entropy and quantum mechanics; canonical Gibbs probability; ideal gas; thermal radiation; Einstein and Debye lattices; grand canonical Gibbs probability; ideal Fermi and Bose gases; chemical reactions and phase transformations.
Recommended: (PH 423 or PH 523) and (PH 451 or PH 551)

PH 551. CAPSTONES IN PHYSICS: QUANTUM MECHANICS. (3 Credits)
Wave mechanics, Schroedinger equation, operators, harmonic oscillator, identical particles, atomic fine structure, approximation methods and applications.
Recommended: (PH 424 or PH 524) and (PH 425 or PH 525) and (PH 426 or PH 526)

PH 555. ASTROPHYSICS. (3 Credits)
Physics of stars and the cosmos.
Recommended: PH 213; PH 315 or equivalent junior-level background in modern physics and thermodynamics.
PH 562. MATHEMATICAL PHYSICS. (3 Credits)
Fundamental mathematical techniques needed for graduate students in physics. Topics include vector spaces and operators; Fourier series, integrals, and transforms; partial differential equations; special functions, distributions, and delta functions; Green’s functions; complex analysis.

Equivalent to: PH 365

PH 575. INTRODUCTION TO SOLID STATE PHYSICS. (3 Credits)
Introduction to condensed matter physics for majors in physics, chemistry, and engineering. Topics include band structure, free electron behavior, optical properties, magnetism, and lattice excitations.
Recommended: PH 451 or PH 551 and concurrent enrollment in PH 427 or PH 527

PH 581. PHYSICAL OPTICS. (4 Credits)
Wave propagation, polarization, interference, diffraction, and selected topics in modern optics.
Recommended: PH 431 or PH 531

PH 582. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: ECE 582
Recommended: PH 481 or PH 581

PH 583. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Equivalent to: ECE 583
Recommended: Completion or concurrent enrollment in ECE 391 or PH 481/581

PH 585. ATOMIC, MOLECULAR, AND OPTICAL PHYSICS. (3 Credits)
Atomic and molecular structure, interaction with electromagnetic fields, atomic and molecular spectra, spectroscopic techniques, laser theory, nonlinear optics.
Recommended: (PH 431 or PH 531) or (PH 451 or PH 551)

PH 591. BIOLOGICAL PHYSICS. (3 Credits)
Basic physics principles applied to the kinetics and dynamics of molecular and cellular processes. Ion channels, two-state systems, dynamics of molecular motors, cell signalling, and multicellular phenomena.
Recommended: PH 320, PH 421, PH 422 and PH 423 or junior-level background in classical mechanics, electromagnetism, and thermodynamics

PH 595. INTRODUCTION TO PARTICLE AND NUCLEAR PHYSICS. (3 Credits)
Elementary particles and forces, nuclear structure and reactions.
Recommended: PH 451 or PH 551

PH 599. SPECIAL TOPICS. (1-16 Credits)
(See PH 499 for description.)
This course is repeatable for 16 credits.

PH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PH 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PH 607. SEMINAR. (1-16 Credits)
Section 1: Departmental Colloquium. Section 3: Nuclear and Particle Physics. Section 5: Atomic, Molecular, and Optical Physics. Section 7: Solid State Physics. Section 9: Computational Physics. One-credit options are graded P/N.
This course is repeatable for 16 credits.

PH 621. DYNAMICS OF SINGLE- AND MULTI-PARTICLE SYSTEMS. (3 Credits)
Introduction to theory of non-linear systems. Chaos in Hamiltonian and dissipative systems. Lyapunov exponents, fractal geometries.
Recommended: PH 435 or PH 535

PH 631. ELECTROMAGNETIC THEORY. (3 Credits)
Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields.
Recommended: PH 431 or PH 531

PH 632. ELECTROMAGNETIC THEORY. (3 Credits)
Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields.
Recommended: PH 631 and (PH 431 or PH 531)

PH 633. ELECTROMAGNETIC THEORY. (3 Credits)
Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields.
Recommended: PH 632 and (PH 431 or PH 531)

PH 641. STATISTICAL THERMOPHYSICS. (3 Credits)
Macroscopic thermodynamics and kinetic theory. Classical and quantal statistical ensembles; partition functions. Applications to atoms and molecules, clustering, solids, radiation.
Recommended: PH 435 or PH 535

PH 642. STATISTICAL THERMOPHYSICS. (3 Credits)
Macroscopic thermodynamics and kinetic theory. Classical and quantal statistical ensembles; partition functions. Applications to atoms and molecules, clustering, solids, radiation.
Recommended: PH 641

PH 651. QUANTUM MECHANICS. (3 Credits)
Basic principles of nonrelativistic quantum theory and applications. Schroedinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering.
Recommended: (PH 435 or PH 535) and (PH 451 or PH 551)

PH 652. QUANTUM MECHANICS. (3 Credits)
Basic principles of nonrelativistic quantum theory and applications. Schroedinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering.
Recommended: (PH 435 or PH 535) and (PH 451 or PH 551) and PH 651

PH 653. QUANTUM MECHANICS. (3 Credits)
Basic principles of nonrelativistic quantum theory and applications. Schroedinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering.
Recommended: (PH 435 or PH 535) and (PH 451 or PH 551) and PH 652

PH 654. ADVANCED QUANTUM THEORY. (3 Credits)
Scattering theory, second quantization and many body theory, relativistic quantum mechanics, quantization of fields, quantum electrodynamics, and elementary particles.
Recommended: PH 653
PH 671. SOLID STATE PHYSICS, ELECTRON TRANSPORT. (2 Credits)
Fundamentals of solid state physics, Boltzmann transport, phonon and defect scattering, quantum transport, transport in magnetic field, localization, Mott-insulator transition, electron tunneling, superconductivity. Offered in alternate years.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 672. SOLID STATE PHYSICS, THEORY. (2 Credits)
The many-body problem, density functional theory, excited states properties, BCS theory of superconductivity. Offered in alternate years.
Recommended: PH 575 and PH 654 and basic knowledge of electromagnetism and quantum mechanics.

PH 673. SOLID STATE PHYSICS, NANOSCIENCE AND NANOTECHNOLOGY. (2 Credits)
Introduction to nanoscience and nanotechnology; semiconductor quantum wells, wires, and dots; bulk metals vs nanoparticles; molecular ensembles vs single molecules; fabrication of nanoparticles and nanostructured materials; scanning probe microscopy; advanced optical imaging and manipulation. Offered in alternate years.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 674. SOLID STATE PHYSICS, MAGNETISM. (2 Credits)
Magnetism of atoms; interaction between magnetic atoms, magnetic ordering in crystalline solids; excitations in magnetic solids; temperature dependent phenomena in magnetic solids; magnetism of metals, alloys, insulators and semiconductors; topics of considerable interest in contemporary research.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 681. ATOMIC, MOLECULAR AND OPTICAL PHYSICS, MODERN OPTICS. (2 Credits)
Maxwell's equations in matter; refraction, phase and group indices; material and geometry dispersion; effective-medium regime. Not offered every year.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 682. ATOMIC, MOLECULAR, OPTICAL PHYSICS, SEMICONDUCTOR OPTICS. (2 Credits)
Linear response theory; polarization effects; interband excitations and emissions; low dimensional systems; excitons; phonons; semiconductor lasers; photovoltaics. Offered alternate years.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 683. ATOMIC, MOLECULAR AND OPTICAL PHYSICS, NONLINEAR OPTICS. (2 Credits)
Coherent nonlinear electromagnetic phenomena; harmonic generation and parametric mixing; quantum mechanical description of multi-photon interactions; incoherent multi-photon interactions; coherent nonlinear optical phenomena and spectroscopies. Offered in alternate years.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 684. ATOMIC, MOLECULAR AND OPTICAL PHYSICS, ULTRAFAST OPTICS. (2 Credits)
Introduction of ultrafast optical science; short pulse propagation in linear media; pulse stretching and compressing; Q-switching and mode-locking; characterization of femtosecond lasers; coherent optical effects. Offered in alternate years.
Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 699. SPECIAL TOPICS: BIOLOGICAL PHYSICS. (3 Credits)
Topics vary from year to year. Not offered every year. This course is repeatable for 9 credits.

Physics Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration
Atomic physics, computational physics, nuclear physics, optical physics, particle physics, physics education, relativity, solid state physics

The Department of Physics offers courses and research experience leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. Advanced-degree candidates may pursue thesis research in experimental, computational, or theoretical AMO (atomic, molecular, and optical) physics, nuclear and particle physics, or solid state physics. Special programs are available for students who are preparing for careers in undergraduate teaching. Thesis and nonthesis programs are offered that lead to the MS and MA degrees. A written comprehensive examination must be passed prior to the nonthesis master’s final oral or the PhD preliminary oral examination. There are no foreign language requirements.

The department maintains a vigorous colloquium program in which well-known physicists present lectures on current research. Students are invited to participate in topical seminars offered regularly in each of the major research areas for the discussion of research results and for studies of specialized subjects at an advanced level.

Fellowships and assistantships are offered to qualified graduate students. A descriptive brochure is available from the Department of Physics.

Major Code: 5900
Major Code: 5900

Physics Graduate Minor

Minor Code: 5900

Minor Code: 590

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Required Core</td>
<td></td>
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<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
<td>12</td>
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<td>&amp; PH 212</td>
<td>and *GENERAL PHYSICS WITH CALCULUS</td>
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<tr>
<td>&amp; PH 213</td>
<td>and *GENERAL PHYSICS WITH CALCULUS</td>
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<tr>
<td>PH 315</td>
<td>PHYSICS OF CONTEMPORARY CHALLENGES</td>
<td>3</td>
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</tbody>
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Electives
Select 12 credits of upper division courses approved by the head undergraduate advisor

Total Hours 27

*  Baccalaureate Core Course (BCC)

Minor Code: 590
Physics Undergraduate Major (BA, BS, HBA, HBS)

Major Code: 590

All physics majors must complete the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Baccalaureate Core</td>
<td>Select 51 credits</td>
<td></td>
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<tr>
<td>Required Courses</td>
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<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
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<tr>
<td>MTH 253 or MTH 306</td>
<td>INFINITE SERIES AND SEQUENCES or MATRIX AND POWER SERIES METHODS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 255</td>
<td>VECTOR CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 256</td>
<td>APPLIED DIFFERENTIAL EQUATIONS</td>
<td>4</td>
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<tr>
<td>MTH 341</td>
<td>LINEAR ALGEBRA I</td>
<td>3</td>
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<tr>
<td>PH 211 &amp; PH 221</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECTATION FOR PHYSICS 211</td>
<td>5</td>
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<td>PH 212 &amp; PH 222</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECTATION FOR PHYSICS 212</td>
<td>5</td>
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<tr>
<td>PH 213 &amp; PH 223</td>
<td>*GENERAL PHYSICS WITH CALCULUS and RECTATION FOR PHYSICS 213</td>
<td>5</td>
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<td>PH 315</td>
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<tr>
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<tr>
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<td>Select one of the following:</td>
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<tr>
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<tr>
<td>Bachelor of Arts in Physics</td>
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Total credits required for graduation: 180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Bachelor of Science in Physics

For graduation with a Bachelor of Science degree in Physics under the basic physics option, additional course requirements consist of:

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<tr>
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<tr>
<td>MTH 255</td>
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Bachelor of Arts in Physics

To graduate with a Bachelor of Arts degree in Physics, additional course requirements consist of:

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<tr>
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<tr>
<td>PH 441</td>
<td>CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS</td>
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<td>PH 451</td>
<td>CAPSTONES IN PHYSICS: QUANTUM MECHANICS</td>
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Total Hours: 22

1 At least 6 additional credits chosen from among the non-blanket Physics courses at the 400-level or beyond, or related courses in another department with the approval of the head undergraduate advisor.

Major Code: 590

- Total Credits: 180
- Physics: 74
- PH Elective must be 400 level course (not 40x)
- Not shown are the Baccalaureate Core courses required by the university: Skills (Fitness, Speech, WR I, WR II), Perspectives (Cultural Diversity, Literature & the Arts, Social Processes & Institutions, Western Culture, and Difference, Power, & Discrimination), Synthesis (Contemporary Global Issues and Science, Technology, & Society)

<table>
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Winter

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Spring

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Second Year

Fall

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Winter

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Spring

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Second Year

Fall

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<tr>
<td>MTH 255</td>
<td>VECTOR CALCULUS II</td>
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PH 222  RECITATION FOR PHYSICS 212  1

Winter
MTH 256  APPLIED DIFFERENTIAL EQUATIONS  4
PH 213  *GENERAL PHYSICS WITH CALCULUS  4
PH 223  RECITATION FOR PHYSICS 213  1

Spring
MTH 253  INFINITE SERIES AND SEQUENCES  1
or MTH 254 and INTRODUCTION TO MATRIX ALGEBRA
or INTRODUCTION TO SERIES  4
MTH 341  LINEAR ALGEBRA I  3
PH 315  PHYSICS OF CONTEMPORARY CHALLENGES  3

Third Year
Fall
PH 335  TECHNIQUES OF THEORETICAL MECHANICS  3
PH 411  ELECTRONICS  3

Hours  6
Winter
PH 422  PARADIGMS IN PHYSICS: STATIC FIELDS  3
PH 425  PARADIGMS IN PHYSICS: QUANTUM FUNDAMENTALS  3
PH 365  COMPUTATIONAL PHYSICS LAB  1
PH 415  COMPUTER INTERFACING AND INSTRUMENTATION  3
PH 401  RESEARCH  3

Hours  11
Spring
PH 424  PARADIGMS IN PHYSICS: OSCILLATIONS AND WAVES  3
PH 426  PARADIGMS IN PHYSICS: CENTRAL FORCES  3
PH 427  PARADIGMS IN PHYSICS: PERIODIC SYSTEMS  3
PH 365  COMPUTATIONAL PHYSICS LAB  1
PH 401  RESEARCH  3

Hours  11
Fourth Year
Fall
PH 403  *THESIS  1
PH 401  RESEARCH  1
PH 423  PARADIGMS IN PHYSICS: ENERGY AND ENTROPY  3
PH 367  COMPUTATIONAL PHYSICS LAB  1
PH 431  CAPSTONES IN PHYSICS: ELECTROMAGNETISM  3
PH elective  3

Hours  12
Winter
PH 403  *THESIS  1
PH 451  CAPSTONES IN PHYSICS: QUANTUM MECHANICS  3
PH 481  PHYSICAL OPTICS  4
PH 464  SCIENTIFIC COMPUTING II  3

Hours  11
Spring
PH 403  *THESIS  1
PH 441  CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS  3
PH elective  3

Hours  7

Total Hours  119

1 Students interested in a MTH minor or double major should take MTH 253. Other students should take MTH 264/MTH 265

2 Three credits of PH 401 are required. Although they can be taken in terms other than shown here, it is strongly recommended to start research by the winter term of the junior year. Students doing external internships as a basis for their research should discuss this with the head advisor

3 Students chose either PH 415 or PH 464

Applied Physics Option

This option is offered within the following major(s):

- Physics - College of Science (p. 974)

Option Code: 589

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<tr>
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<td>MTH 253</td>
<td>INFINITE SERIES AND SEQUENCES</td>
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<td>VECTOR CALCULUS II</td>
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Select two of the following:

- PH 431  CAPSTONES IN PHYSICS: ELECTROMAGNETISM
- PH 441  CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS
- PH 451  CAPSTONES IN PHYSICS: QUANTUM MECHANICS

Applied Physics Electives

Select 15 credits 1

Total Hours  114
15 credits of approved upper-division courses in physics or engineering at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in engineering.

- Baccalaureate Core Course (BCC)
- Writing Intensive Course (WIC)

Option Code: 589

Biological Physics Option

This option is offered within the following major(s):
- Physics - College of Science (p. 974)

The Biological Physics option allows students to focus part of their course load on work in the field of biophysics.

Option Code: 586

Chemical Physics Option

This option is offered within the following major(s):
- Physics - College of Science (p. 974)
PH 451 CAPSTONES IN PHYSICS: QUANTUM MECHANICS

Chemical Physics Electives
Select 15 credits

Total Hours 114

1. 15 credits of approved upper-division courses in physics or chemistry at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in chemistry.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Option Code:** 588

**Computational Physics Option**

This option is offered within the following major(s):

- Physics - College of Science (p. 974)

**Option Code:** 592

**Geophysics Option**

This option is offered within the following major(s):

- Physics - College of Science (p. 974)

**Option Code:** 593

---

**PH 441 CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS**

Computational Physics Electives
Select 15 credits

Total Hours 114

1. 15 credits of approved upper-division courses in physics or computational science at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in computational science.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Option Code:** 592

**Geophysics Option**

This option is offered within the following major(s):

- Physics - College of Science (p. 974)

**Option Code:** 593

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**Math**

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**Chemistry**

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**Physics Core**

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**Senior-level Physics**

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Select two of the following:

- PH 431 CAPSTONES IN PHYSICS: ELECTROMAGNETISM

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**Chemistry**

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**Senior-level Physics**

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<td>PH 403</td>
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Select two of the following:

- PH 431 CAPSTONES IN PHYSICS: ELECTROMAGNETISM
PH 431 CAPSTONES IN PHYSICS: ELECTROMAGNETISM

PH 441 CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS

PH 451 CAPSTONES IN PHYSICS: QUANTUM MECHANICS

Geophysics Electives
Select 15 credits 1
Total Hours 114

1 15 credits of approved upper-division courses in physics or earth science at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in earth science.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 593

Mathematical Physics Option

This option is offered within the following major(s):

- Physics - College of Science (p. 974)

Option Code: 587

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<th>Code</th>
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Select two of the following:

PH 431 CAPSTONES IN PHYSICS: ELECTROMAGNETISM
PH 441 CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS
PH 451 CAPSTONES IN PHYSICS: QUANTUM MECHANICS

Mathematical Physics Electives
Select 15 credits 1
Total Hours 114

1 15 credits of approved upper-division courses in physics or mathematics at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in mathematics.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 587

Optical Physics Option

This option is offered within the following major(s):

- Physics - College of Science (p. 974)

Option Code: 594

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PH 431 CAPSTONES IN PHYSICS: ELECTROMAGNETISM
PH 441 CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS
PH 451 CAPSTONES IN PHYSICS: QUANTUM MECHANICS

Optical Physics Electives
Select 15 credits

Total Hours 114

15 credits of approved upper-division courses in physics or optics at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in optics.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 594

Physics Teaching/Physics Option

This option is offered within the following major(s):

• Physics - College of Science (p. 974)

Option Code: 777

Code Title Hours
Math
MTH 251 *DIFFERENTIAL CALCULUS 4
MTH 252 INTEGRAL CALCULUS 4
MTH 253 INFINITE SERIES AND SEQUENCES 4
or MTH 306 MATRIX AND POWER SERIES METHODS 4
MTH 254 VECTOR CALCULUS I 4
MTH 255 VECTOR CALCULUS II 4
MTH 256 APPLIED DIFFERENTIAL EQUATIONS 4
MTH 341 LINEAR ALGEBRA I 3
Chemistry
CH 231 GENERAL CHEMISTRY 5
& CH 261 and *LABORATORY FOR CHEMISTRY 231 5
CH 232 GENERAL CHEMISTRY 5
& CH 262 and *LABORATORY FOR CHEMISTRY 232 5
CH 233 GENERAL CHEMISTRY 5
& CH 263 and *LABORATORY FOR CHEMISTRY 233 5
Physics Core
PH 211 *GENERAL PHYSICS WITH CALCULUS 5
& PH 221 and RECYCLATION FOR PHYSICS 211 5
PH 212 *GENERAL PHYSICS WITH CALCULUS 5
& PH 222 and RECYCLATION FOR PHYSICS 212 5
PH 213 *GENERAL PHYSICS WITH CALCULUS 5
& PH 223 and RECYCLATION FOR PHYSICS 213 5
PH 315 PHYSICS OF CONTEMPORARY CHALLENGES 3
PH 335 TECHNIQUES OF THEORETICAL MECHANICS 3
PH 365 COMPUTATIONAL PHYSICS LAB 3
& PH 366 and COMPUTATIONAL PHYSICS LAB 3
& PH 367 and COMPUTATIONAL PHYSICS LAB 3
PH 411 ELECTRONICS 3
PH 422 PARADIGMS IN PHYSICS: STATIC FIELDS 3
PH 423 PARADIGMS IN PHYSICS: ENERGY AND ENTROPY 3
PH 424 PARADIGMS IN PHYSICS: OSCILLATIONS AND WAVES 3
PH 425 PARADIGMS IN PHYSICS: QUANTUM FUNDAMENTALS 3
PH 426 PARADIGMS IN PHYSICS: CENTRAL FORCES 3
PH 427 PARADIGMS IN PHYSICS: PERIODIC SYSTEMS 3

Senior-level Physics

PH 401 RESEARCH 3
PH 403 *THESIS 3

Select two of the following:

PH 431 CAPSTONES IN PHYSICS: ELECTROMAGNETISM
PH 441 CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS
PH 451 CAPSTONES IN PHYSICS: QUANTUM MECHANICS

Physics Education Electives
Select 15 credits

Total Hours 114

15 credits of approved upper-division courses in physics or education at the 400 level or beyond, including at least one laboratory course, which form a coherent set. At least 8 of these credits must be in education.

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 777

School of Life Sciences

The School of Life Sciences has three departments:

1. Biochemistry and Biophysics (p. 979)
2. Integrative Biology (p. 993)
3. Microbiology (p. 1019)

Biochemistry and Biophysics

The Department of Biochemistry and Biophysics (BB) is part of the School of Life Sciences.

The Department has world-class faculty, a tradition of interdisciplinary research, teaching excellence and extraordinary laboratories to facilitate undergraduate and graduate learning. The department ranks high nationally and internationally in many research areas of biochemistry and molecular biophysics, including structural biology, genetic code expansion technology, metabolic regulation, signal transduction, protein chemistry, gene expression, epigenetics, cell cycle control and cell movement and adhesion.

Undergraduate Degrees

Biochemists explore the chemical structure of living matter and the chemical reactions occurring in living cells. Biophysicists use the methods of physical science to study the structure and functions of macromolecules. The Department offers two BS degrees, both accredited by the American Society for Biochemistry and Molecular Biology (ASBMB):

• Biochemistry and Biophysics (BB)
• Biochemistry and Molecular Biology (BMB) with options in Advanced Molecular Biology, Computational Molecular Biology, and Pre-Medicine.

Both degrees provide students a foundation in the physical and biological sciences. They are designed to help students prepare for careers in the health sciences, for technical employment at the BS level, or for graduate study in the life sciences. Graduates of the department’s programs have found rewarding careers in medicine, dentistry, clinical chemistry, biotechnology, genetics, cell biology, forensic science, pharmacology, physiology, toxicology, and nutrition, as well
as in biochemistry or biophysics. Others have used the degree as a springboard to nontechnical careers that benefit from a broad scientific background, including business, intellectual property law, journalism, and health care administration. Both majors benefit from the wealth of departmental course offerings and faculty research programs. Because of the interdisciplinary nature of the program, students majoring in Biochemistry and Biophysics and Biochemistry and Molecular Biology cannot seek a dual major or double degree in both majors or in the BioHealth Sciences, Biology, Zoology and Microbiology majors.

High school students interested in careers in biochemistry or biophysics should prepare for college by taking four years of mathematics and at least one year each of physics, chemistry, and biology. Students transferring from a community college should have completed one year each of the following by the end of the sophomore year, if they plan to graduate in four years’ total time: general chemistry, organic chemistry, calculus-based physics, general biology and three semesters or four quarters of calculus, including vector calculus. An excellent advising program is available to undergraduates, and prospective students are encouraged to consult with a departmental advisor or with faculty members working in an area of interest to them. Undergraduate students are also encouraged to participate in research in the laboratory of a faculty member.

Graduate Degrees
The Biochemistry and Biophysics department also oversees an internationally recognized graduate program that offers PhD and MS degrees, including a “4+1” Accelerated Masters Program degree. Faculty in the program include departmental faculty and also a group of affiliate faculty from other departments who have research programs in the molecular life sciences. Graduate program faculty have diverse research expertise including protein and DNA structural biology, redox biology, protein homeostasis, aging, single molecule studies, molecular motors, genetic code expansion, molecular neuroscience, bioinformatics and computational biophysics, metabolic regulation, signal transduction, vitamin D and innate immunity, gene expression, epigenetics, cell cycle control, membrane dynamics and repair, biomineralization, and cell movement and adhesion. Detailed information on the graduate faculty and program is available from the Department of Biochemistry and Biophysics website (http://biochem.science.oregonstate.edu).

Undergraduate Programs

Majors
- Biochemistry and Biophysics (p. 985)
- Biochemistry and Molecular Biology (p. 990)

Options:
- Advanced Molecular Biology
- Computational Molecular Biology
- Pre-Medicine/Biochemistry and Molecular Biology

Minor
- Biochemistry and Biophysics (p. 984)

Graduate Programs

Major
- Biochemistry and Biophysics (p. 984)

Minor
- Biochemistry and Biophysics (p. 984)

Oregon State University
Corvallis, OR 97331-7305
Email: karplusp@oregonstate.edu
Website: http://biochem.science.oregonstate.edu

Faculty

Professors
- Ahern, Andrews, Baird, Barbar, Beckman, Freitag, Gombart, Hagen, Karplus, Mehl

Associate Professors
- Hsu, Johnson, McFadden, Perez

Assistant Professors
- Hendrix, Nyarko, Qiu

Senior Instructors
- van Zee

Instructor
- Dalton

Assistant Professor, Senior Research
- Cooley, Franco

Associate Professor, Senior Research
- Estevez

Biochemistry and Biophysics

BB 100. THE MOLECULES OF LIFE. (2 Credits)
A brief introduction to molecular biology for nonspecialists. Subjects vary, but have included biochemical basis of the origin of life, biochemical genetics, biochemical aspects of memory and behavior, mutagenesis, bioenergetics and nutrition, and environmental biochemistry.
Equivalent to: BB 100H

BB 111. INTRODUCTION TO BIOCHEMISTRY AND BIOPHYSICS RESEARCH. (1 Credit)
Designed to introduce biochemistry and biophysics students to departmental research opportunities and advisors.

BB 211. PROFESSIONAL DEVELOPMENT II: MOLECULAR, MICROBIAL, BIOHEALTH. (1 Credit)
Develop awareness of the elements of professional development, identify strategic areas for growth, and design an exploration plan. Emphasis is placed on being able to analyze career opportunities to determine the best mix of technical and professional skills needed for success as a biological science professional. Graded P/N. CROSSLISTED as BB 211/ BHS 211.
Equivalent to: BHS 211

BB 314. CELL AND MOLECULAR BIOLOGY. (4 Credits)
Fundamental concepts of prokaryotic and eukaryotic cell biology. Emphasizes cell structure and function at the molecular level. Lec/rec.
Prerequisites: (( (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])) and (CH 331 (may be taken concurrently) [C-] or CH 334 (may be taken concurrently) [C-])
Equivalent to: BB 314H, BI 314, BI 314H

BB 314H. CELL AND MOLECULAR BIOLOGY. (4 Credits)
Fundamental concepts of prokaryotic and eukaryotic cell biology. Emphasizes cell structure and function at the molecular level. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (( (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])) and (CH 331 (may be taken concurrently) [C-] or CH 334 (may be taken concurrently) [C-])
Equivalent to: BB 314, BI 314, BI 314H
BB 315. MOLECULAR BIOLOGY LABORATORY. (3 Credits)
Laboratory projects exploring the transmission of genetic information from storage to function will introduce students to fundamental molecular biology concepts and techniques, including isolation of DNA, construction of recombinant plasmids, quantification of gene expression in model organisms, polymerase chain reaction, and analysis of protein expression and subcellular localization. Lec/lab. CROSSTLISTED as BB 315/Bi 315.
Prerequisites: BB 314 with C- or better or BB 314H with C- or better
Equivalent to: BI 315

BB 317. *SCIENTIFIC THEORY AND PRACTICE. (3 Credits)
Teaches students the practice of biological science. Topics cover scientific theory, communications, ethics and critical evaluation.
CROSSTLISTED as BB 317/Bi 317. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])
Equivalent to: BI 317

BB 331. *INTRODUCTION TO MOLECULAR BIOLOGY. (3 Credits)
Course dealing with the molecular basis of cellular function, with emphasis upon modern developments, and the foundation for practical applications of this knowledge. The course will involve the conceptual background necessary to appreciate the applications of molecular biology. Throughout the course opportunities will be given to discuss public policy issues and questions: What are the moral and practical problems that flow from identification of an individual as being at risk for a late-appearing genetic disorder, such as Huntington’s disease or certain cancers? Does the scientific or public value of knowing the entire DNA sequence of the human genome justify a situation in which individual or small-scale research cannot be supported? What issues arise when the fruits of biological research, mostly publicly funded, are commercialized? Should a novel organism be patented? How can biotechnology be applied to environmental problems? (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: CH 122 with D- or better or CH 202 with D- or better or CH 222 with D- or better or CH 225H with D- or better or ((CH 232 with D- or better or CH 232H with D- or better) or (CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better))

BB 332. *MOLECULAR MEDICINE. (3 Credits)
Provides students an understanding of medical advances from a rapidly evolving molecular point of view. Advances in knowledge of the human genome arising from DNA sequencing efforts and major leaps in understanding of the regulating cellular growth and division are presented in an easy-to-understand fashion appropriate for students in all majors. Course discussions and assignments will cover implications of advances in molecular medicine from ethical, economic, technical and societal standpoints. The aim of the course is to present technical material in a way that non-scientists will understand and conversely to summarize ethical, economic, and philosophical considerations in a way that the scientists understand the implications of these technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Any biology course.

BB 345. INTRODUCTION TO BIOLOGICAL SEQUENCE ANALYSIS. (2 Credits)
Introduction to computer-based analyses of biomolecular data, particularly nucleic acid and protein sequences, with the Python programming language. Topics include reading and writing of sequence files, subsequences, reverse complement, finding sequence patterns, subroutines, control structures, and parsing complex data files.

BB 350. ELEMENTARY BIOCHEMISTRY. (4 Credits)
Service course for students desiring a short introduction to biochemistry. Four lectures weekly.
Prerequisites: CH 331 with D- or better and CH 332 (may be taken concurrently) [D-]

BB 360. INTRODUCTION TO NEUROSCIENCE. (3 Credits)
An introduction to the field of neuroscience. Topics include structure of neurons, outline of signaling in the central nervous system, Nernst equation, action potentials, synaptic transmission, chemical signaling in vision, disease and drugs.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-])

BB 361. NEUROSCIENCE OF SENSORY AND MOTOR SYSTEMS. (3 Credits)
Provides advanced knowledge and understanding of the structure and function of the sensory and motor systems and the interactions between them. These systems will be considered in the context of human physiology.
Prerequisites: BB 360 with C- or better

BB 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: BB 399H
This course is repeatable for 16 credits.

BB 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 399
This course is repeatable for 16 credits.

BB 401. UNDERGRADUATE RESEARCH. (1-16 Credits)
Equivalent to: BB 401H
This course is repeatable for 16 credits.

BB 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BB 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BB 405H
This course is repeatable for 16 credits.

BB 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 405
This course is repeatable for 16 credits.

BB 407. BIOCHEMISTRY/BIOPHYSICS SEMINAR. (1-16 Credits)
Informal seminars presenting information about research problems and careers and research programs on campus in biochemistry or biophysics. Graded P/N.
Equivalent to: BB 407H
This course is repeatable for 99 credits.

BB 407H. BIOCHEMISTRY/BIOPHYSICS SEMINAR. (1-16 Credits)
Informal seminars presenting information about research problems and careers and research programs on campus in biochemistry or biophysics.
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 407
This course is repeatable for 99 credits.

BB 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
BB 450. GENERAL BIOCHEMISTRY. (4 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551, three lectures.
Prerequisites: CH 332 with D- or better or CH 336 with D- or better
Equivalent to: BB 450H

BB 451. GENERAL BIOCHEMISTRY. (3 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551, three lectures.
Prerequisites: BB 450 with D- or better or BB 450H with D- or better
Equivalent to: BB 451H

BB 460. ADVANCED CELL BIOLOGY. (3 Credits)
History and theory of cell biology; microscopy and other techniques to study cells and organelles; membranes; organelles; protein import; cell signaling; cytoskeleton; polarity; cell cycle; stem cells; pattern formation; cancer biology. Offered every other fall in odd years.
Prerequisites: BB 314 with C- or better or BI 314 with C- or better or BI 314H with C- or better or BB 451 with C- or better or BB 492 with C- or better

BB 481. MACROMOLECULAR STRUCTURE. (3 Credits)
An introduction to structural biology, the discipline focused on understanding the structural properties of biological macromolecules—especially proteins and nucleic acids—and relating them to their function. Introduces students to the vocabulary and tools of this discipline, covering both the fundamental physico-chemical principles governing the structure and function of biological macromolecules and a selected set of widely used experimental and theoretical approaches to their characterization. This is done through lectures, and textbook and literature readings. Graduate students receive additional experience in scientific reading, writing and presentation through a literature-based term project.
Prerequisites: BB 450 with D- or better or BB 490 with D- or better

BB 482. BIOPHYSICS. (3 Credits)
Sequence professional course covering quantitative properties of biological systems and biological phenomena using concepts derived from mathematics and physics.
Prerequisites: BB 481 with D- or better and CH 442 [D]

BB 483. ADVANCED BIOCHEMISTRY AND BIOPHYSICS: CAPSTONE. (3 Credits)
Covers applications of advanced biophysical techniques, and how these fit within the larger context of biochemistry, biology and society. Explores techniques and their applications to macromolecules as well as the scientific process. Techniques discussed include in vitro, in vivo, and in silico methods, with an emphasis on biomolecular interactions.
Prerequisites: BB 482 with D- or better or BB 582 with D- or better

BB 484. CHROMATIN AND EPIGENETICS. (3 Credits)
An in-depth look at ‘chromatin’ (the complex generated by DNA, RNA and complex protein) and how it behaves during gene activation and silencing. Specific examples of long-lasting gene regulation (across cell cycles) will be used to describe the concept of ‘epigenetic’ gene regulation by modification of DNA or proteins. The class will combine more traditional lectures with discussion periods where primary research papers will be analyzed. The target audience is third- and fourth-year students as well as graduate students.
Prerequisites: (BB 314 with C- or better or BI 314H with C- or better or BB 314 with C- or better or BB 495 with C- or better and (BB 315 [C-] or BB 315 [C-] or BB 493 [C-] or BB 493H [C-])

BB 485. APPLIED BIOINFORMATICS. (3 Credits)
Fundamental concepts needed to understand the software and methods used in bioinformatics. Includes contemporary techniques such as databases, gene and genome annotations, functional annotations, sequence alignment, motif finding, secondary structure prediction, phylogenetic tree construction, high-throughput sequence data, ChIP-Seq peak identification, transcriptome profiling by RNA-Seq, microRNA discovery and target prediction.
Prerequisites: BB 314 with C- or better or BB 314H with C- or better

BB 486. ADVANCED MOLECULAR GENETICS. (3 Credits)
Covers aspects of transmission genetics (Mendel's laws, mapping strategies) informed by the machineries required for genetic information storage, transcription, translation, and protein processing. Analyses of state-of-the-art primary literature and lectures give a perspective on important “model” organisms, including examples from among bacteria, plants, fungi, and animals.
Prerequisites: BB 314 with C- or better or BB 314H with C- or better and (BB 492 [C-] or BB 451 [C-])

BB 490. BIOCHEMISTRY 1: STRUCTURE AND FUNCTION. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The first course in the series, BB 490/BB 590, covers how the structure and function of biological macromolecules arises from the organic chemistry of their fundamental building blocks. The organic chemistry of biochemistry will be a focus, including the mechanisms by which enzymes catalyze biological reactions.
Prerequisites: CH 332 with C- or better or CH 336 with C- or better

BB 491. BIOCHEMISTRY 2: METABOLISM. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The second course in a series, BB 491/BB 591 covers the mechanisms and regulation of the pathways by which cells break down fuel molecules, conserve some of the released energy in the form of reactive nucleotides, and use this energy to create biological building blocks from simpler metabolites.
Prerequisites: BB 490 with D- or better or BB 590 with D- or better

BB 492. BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The third course in the series, BB 492/BB 592 focuses on genetic biochemistry, including the synthesis of nucleotides, DNA synthesis and repair, RNA synthesis and processing, and protein synthesis and modification.
Prerequisites: (BB 490 with D- or better or BB 590 with D- or better) and (BB 491 [D-] or BB 591 [D-])

BB 493. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1. (3 Credits)
Laboratory course to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Prerequisites: (BB 451 with D- or better or BB 451H with D- or better) or BB 492 with D- or better
Equivalent to: BB 493H

BB 494. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2. (3 Credits)
Laboratory to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Prerequisites: BB 493 with D- or better or BB 593 with D- or better or BB 315 with D- or better or BI 315 with D- or better
Equivalent to: BB 494H
BB 498. ASBMB CERTIFICATION EXAM. (0 Credits)
A comprehensive, standardized test administered by the American Society of Biochemistry and Molecular Biology and used as a direct assessment of the discipline specific knowledge of seniors in the majors administered by the Biochemistry and Biophysics department. A pass will be given to all students who complete the exam. Contact the Biochemistry and Biophysics Program for more information.

BB 499. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
This course is repeatable for 16 credits.

BB 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BB 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BB 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BB 507. SEMINAR. (1-2 Credits)
Section 1: Descriptions of campus research programs in biochemistry and biophysics, 1 credit fall. Graded P/N. Student presentations of current research literature, 1 credit winter and spring. Should be taken by all entering departmental graduate students. Section 2: Presentation of departmental research seminar, 2 credits any term. PhD candidates in biochemistry and biophysics present a departmental research seminar in the third or fourth year. One registers in the term the seminar is presented. This course is repeatable for 16 credits.

BB 550. GENERAL BIOCHEMISTRY. (4 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551 and BB 452, three lectures.
Recommended: CH 332

BB 551. GENERAL BIOCHEMISTRY. (3 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551 and BB 452, three lectures.
Recommended: BB 550

BB 560. ADVANCED CELL BIOLOGY. (3 Credits)
History and theory of cell biology; microscopy and other techniques to study cells and organelles; membranes; organelles; protein import; cell signaling; cytoskeleton; polarity; cell cycle; stem cells; pattern formation; cancer biology.
Recommended: BB 314 or BI 314 or BI 314H or BB 492 or BB 451

BB 581. MACROMOLECULAR STRUCTURE. (3 Credits)
An introduction to structural biology, the discipline focused on understanding the structural properties of biological macromolecules—especially proteins and nucleic acids—and relating them to their function. Introduces students to the vocabulary and tools of this discipline, covering both the fundamental physico-chemical principles governing the structure and function of biological macromolecules and a selected set of widely used experimental and theoretical approaches to their characterization. This is done through lectures, and textbook and literature readings. Graduate students receive additional experience in scientific reading, writing and presentation through a literature-based term project.
Recommended: BB 450 or BB 490

BB 582. BIOPHYSICS. (3 Credits)
Sequence professional course covering quantitative properties of biological systems and biological phenomena using concepts derived from mathematics and physics.
Prerequisites: BB 581 with C or better
Recommended: CH 442

BB 583. ADVANCED BIOCHEMISTRY AND BIOPHYSICS: CAPSTONE. (3 Credits)
Covers applications of advanced biophysical techniques, and how these fit within the larger context of biochemistry, biology and society. Explores techniques and their applications to macromolecules as well as the scientific process. Techniques discussed include in vitro, in vivo, and in silico methods, with an emphasis on biomolecular interactions.
Prerequisites: BB 582 with C or better

BB 584. CHROMATIN AND EPIGENETICS. (3 Credits)
An in-depth look at 'chromatin' (the complex generated by DNA, RNA and complex protein) and how it behaves during gene activation and silencing. Specific examples of long-lasting gene regulation (across cell cycles) will be used to describe the concept of 'epigenetic' gene regulation by modification of DNA or proteins. The class will combine more traditional lectures with discussion periods where primary research papers will be analyzed. The target audience is third- and fourth-year students as well as graduate students.
Recommended: (BI 314 or BI 314H) and BI 315

BB 585. APPLIED BIOINFORMATICS. (3 Credits)
Fundamental concepts needed to understand the software and methods used in bioinformatics. Includes contemporary techniques such as databases, gene and genome annotations, functional annotations, sequence alignment, motif finding, secondary structure prediction, phylogenetic tree construction, high-throughput sequence data, ChiP-Seq peak identification, transcriptome profiling by RNA-Seq, microRNA discovery and target prediction.
Recommended: BB 314 or BB 314H

BB 586. ADVANCED MOLECULAR GENETICS. (3 Credits)
Covers aspects of transmission genetics (Mendel's laws, mapping strategies) informed by the machineries required for genetic information storage, transcription, translation, and protein processing. Analyses of state-of-the-art primary literature and lectures give a perspective on important "model" organisms, including examples from among bacteria, plants, fungi, and animals.
Recommended: (BI 314 or BI 314H) and BI 315 and BB 492

BB 590. BIOCHEMISTRY 1: STRUCTURE AND FUNCTION. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The first course in the series, BB 490/BB 590, covers how the structure and function of biological macromolecules arises from the organic chemistry of their fundamental building blocks. The organic chemistry of biochemistry will be a focus, including the mechanisms by which enzymes catalyze biological reactions.
Recommended: CH 332 or CH 336

BB 591. BIOCHEMISTRY 2: METABOLISM. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The second course in a series, BB 491/BB 591 covers the mechanisms and regulation of the pathways by which cells break down fuel molecules, conserve some of the released energy in the form of reactive nucleotides, and use this energy to create biological building blocks from simpler metabolites.
Prerequisites: BB 590 with C or better
BB 592. BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The third course in the series, BB 492/BB 592 focuses on genetic biochemistry, including the synthesis of nucleotides, DNA synthesis and repair, RNA synthesis and processing, and protein synthesis and modification.
Prerequisites: BB 590 with C or better and BB 591 [C]

BB 593. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1. (3 Credits)
Laboratory course to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Recommended: (BB 451 or BB 451H) or BB 492

BB 594. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2. (3 Credits)
Laboratory to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Recommended: BB 493 or BB 593 or BB 315 or BI 315

BB 599. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
This course is repeatable for 16 credits.

BB 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BB 605. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BB 607. SEMINAR. (1-2 Credits)
Section 1: Descriptions of campus research programs in biochemistry and biophysics, 1 credit fall. Graded P/N. Student presentations of current research literature, 1 credit winter and spring. Should be taken by all entering departmental graduate students. Section 2: Presentation of departmental research seminar, 2 credits any term. PhD candidates in biochemistry and biophysics present a departmental research seminar in the third or fourth year. One registers in the term the seminar is presented.
This course is repeatable for 16 credits.

BB 650. SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS. (3 Credits)
Nonsequence courses designed to acquaint student with current research in biochemistry and biophysics. Courses include enzyme kinetics, cell cycle and cancer, neurochemistry, oxidative stress, cell adhesion and motility. Most courses offered alternate years.
This course is repeatable for 18 credits.

BB 651. SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS. (3 Credits)
Nonsequence courses designed to acquaint student with current research in biochemistry and biophysics. Courses include cell surfaces, enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.
This course is repeatable for 18 credits.

BB 652. SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS. (3 Credits)
Nonsequence courses designed to acquaint student with current research in biochemistry and biophysics. Courses include enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.
This course is repeatable for 18 credits.

BB 699. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

Biochemistry and Biophysics
Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Biochemistry, biophysics

Administered by the Department of Biochemistry and Biophysics under the School of Life Sciences.

The Department of Biochemistry and Biophysics offers graduate work leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees. Most graduate students are admitted for study toward the PhD.

The PhD program requires course work in biochemistry and biophysics, passing written and oral examinations, participating in the departmental seminar program, and research leading to a doctoral thesis. Although most students in the department receive financial support in the form of research assistantships, all students are expected to participate to a limited degree in the teaching program of the department, regardless of the source of support. In general, financial support is provided for PhD candidates only.

Major Code: 5060

Major Code: 5060

Biochemistry and Biophysics
Graduate Minor

Administered by the Department of Biochemistry and Biophysics under the School of Life Sciences.

Minor Code: 5060

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>BB 550</td>
<td>GENERAL BIOCHEMISTRY</td>
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<td>&amp; BB 551</td>
<td>and GENERAL BIOCHEMISTRY</td>
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<td>BB 590</td>
<td>BIOCHEMISTRY 1: STRUCTURE AND FUNCTION</td>
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<td>BB 591</td>
<td>BIOCHEMISTRY 2: METABOLISM</td>
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<td>BB 592</td>
<td>BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY</td>
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<td>Plus BB-related graduate level courses with BB graduate advisor approval</td>
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<td>Pre-approved Courses</td>
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<td>BB 581</td>
<td>MACROMOLECULAR STRUCTURE</td>
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<td>BB 582</td>
<td>BIOPHYSICS</td>
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<td>BB 583</td>
<td>ADVANCED BIOCHEMISTRY AND BIOPHYSICS: CAPSTONE</td>
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<td>BB 593</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
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Biochemistry and Biophysics Undergraduate Major (BS, HBS)

Administered by the Department of Biochemistry and Biophysics under the School of Life Sciences.

Accredited by the American Society for Biochemistry and Molecular Biology (https://www.asbmb.org/Accreditation/Schools/).

The BS degree in Biochemistry and Biophysics provides a degree path centered on the chemistry and physics of life processes with training that integrates the principles of chemistry, physics, mathematics, statistics, biochemistry, cell and molecular biology, and biological sequence analysis. Biochemists explore the chemical structure of living matter and the chemical reactions occurring in living cells. Biophysicists use the methods of physical science to study the structure and functions of macromolecules. Biochemistry and Biophysics majors receive excellent training for careers in medicine and related health professions, biotechnology and pharmaceutical industries, or for graduate study in biochemistry and biophysics. Training in biophysics is especially valuable for students who are interested in drug design. Majors must select an option either in Advanced Biophysics (p. 987), Neuroscience (p. 988), or Pre-Medicine/Biochemistry and Biophysics (p. 988). The first two options are designed for students interested in careers in the biotechnology and pharmaceutical industries or graduate work in biochemistry and biophysics, with the second especially well-suited for students interested in neuroscience. The third option is ideal for students interested in careers in medicine and related health professions.

Major Code: 506

Students majoring in Biochemistry and Biophysics cannot seek a double major in Biochemistry and Molecular Biology, Biology, Biohealth Sciences, Botany, Microbiology or Zoology.

Minor Code: 5060
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<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<td>BB 111 INTRODUCTION TO BIOCHEMISTRY AND BIOPHYSICS RESEARCH</td>
<td>1</td>
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<td>CH 231 GENERAL CHEMISTRY</td>
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<td>+ Honors versions of these course are available</td>
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**Advanced Biophysics Option**

This option is offered within the following major(s):

- Biochemistry and Biophysics - College of Science (p. 985)

The Advanced Biophysics Option is designed for students interested in pursuing graduate work in biophysics or entering the workforce in biophysics and pharmaceutical industries. It provides advanced training in physical chemistry and physics, bioinformatics, statistics, mathematics, and other areas of current research in biophysics, in addition to the core courses in the major. Students are strongly encouraged to participate in undergraduate research, and up to three research credits can be applied to the Upper-Division Science Elective requirements. Faculty advisors work with students to help them identify electives, research opportunities, and professional internships that align with their interests.

**Option Code: 927**

Options in the Biochemistry and Biophysics major require a minimum of twenty-one credits to complete in addition to the Biochemistry and Biophysics major. Most students can complete the major and Advanced Biophysics option requirements in four years.

Students may pursue either the Advanced Biophysics, Neuroscience, or Pre-medicine/Biochemistry and Biophysics option with the Biochemistry and Biophysics major—no dual combinations are permitted.

For further information, see MyDegrees or the Department of Biochemistry and Biophysics (https://biochem.science.oregonstate.edu/) website (https://biochem.science.oregonstate.edu/).

### Code Title Hours

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<td>CH 441 &amp; CH 442</td>
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1 Alternate series is ST 351, ST 411, and ST 412
Neuroscience Option

This option is offered within the following major(s):

- Biochemistry and Biophysics - College of Science (p. 985)

The Neuroscience option is designed for students interested in combining foundational training in chemistry, biology, mathematics, physics, biochemistry, and biophysics with training in psychology, neuroscience, and anatomy and physiology to deepen their understanding of the brain and the nervous system. This option supports students who want to pursue graduate work in neuroscience, biophysics, bioinformatics, and pharmaceutical research as well as work in health professions. Students are strongly encouraged to participate in undergraduate research, and up to three research credits can be applied to the Upper-division Science Elective requirements. Faculty advisors work with students to help them identify electives, research opportunities, and professional internships that align with their interests.

Option Code: 926

Options in the Biochemistry and Biophysics major require a minimum of twenty-one credits to complete in addition to the Biochemistry and Biophysics major. Most students can complete the major and Neuroscience option requirements in four years.

Students may either pursue the Neuroscience, Advanced Biophysics, or Pre-medicine/Biochemistry and Biophysics option with the Biochemistry and Biophysics major - no dual combinations are permitted.

For further information, see MyDegrees or the Department of Biochemistry and Biophysics (https://biochem.science.oregonstate.edu/) website (https://biochem.science.oregonstate.edu/).

Pre-Medicine/Biochemistry and Biophysics Option

This option is offered within the following major(s):

- Biochemistry and Biophysics - College of Science (p. 985)

Biochemistry and Biophysics students interested in a career in medicine should choose this option. It may also be suitable for students interested in some other health professions, and these students should first consult with their advisor. In addition to offering a rigorous foundation in general chemistry, organic chemistry, mathematics, physics, biology, biochemistry, cell and molecular biology, biophysics, statistics, and biological sequence analysis, the Pre-medicine option meets the requirements for most medical schools in the U.S. by providing students with training in genetics, psychology, ethics, and social sciences. Students have a wide choice of medically relevant electives in areas such as anatomy and physiology, microbiology, neuroscience, and immunology. Students are strongly encouraged to participate in undergraduate research. Faculty pre-medical advisors guide students
to integrate undergraduate research and other relevant professional opportunities into their undergraduate experience and to prepare themselves as strong candidates for admission to the professional schools of their interest.

**Option Code: 928**

Options in the Biochemistry and Biophysics major require a minimum of twenty-one credits to complete in addition to the Biochemistry and Biophysics major. Most students can complete the major and Pre-med/Biochemistry and Biophysics option requirements in four years.

Students may pursue either the Pre-med/Biochemistry and Biophysics, Advanced Biophysics, or Neuroscience option with the Biochemistry and Biophysics major—no dual combinations are permitted.

For further information, see MyDegrees or the Department of Biochemistry and Biophysics (https://biochem.science.oregonstate.edu/) website (https://biochem.science.oregonstate.edu/).

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**Course**

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**Winter**

| CH 232     | GENERAL CHEMISTRY                          | 4     |
| CH 262     | *LABORATORY FOR CHEMISTRY 232              | 1     |
| MTH 252    | INTEGRAL CALCULUS                          | 4     |
| WR 121     | *ENGLISH COMPOSITION                       | 3     |
| Bacc Core or Elective |                                    | 3     |

**Spring**

| BI 109     | HEALTH PROFESSIONS: MEDICAL               | 1     |
| CH 233     | GENERAL CHEMISTRY                          | 4     |
| CH 263     | *LABORATORY FOR CHEMISTRY 233              | 1     |
| HHS 231    | *LIFETIME FITNESS FOR HEALTH              | 2     |
| MTH 254    | VECTOR CALCULUS I                          | 4     |
| Bacc Core or Elective |                                    | 3     |

**Second Year**

| BI 211     | *PRINCIPLES OF BIOLOGY                     | 4     |
| CH 334     | ORGANIC CHEMISTRY                          | 3     |
| PH 211     | *GENERAL PHYSICS WITH CALCULUS             | 4     |
| Bacc Core or Elective |                                    | 3     |

**Winter**

| BI 212     | *PRINCIPLES OF BIOLOGY                     | 4     |
| CH 335     | ORGANIC CHEMISTRY                          | 3     |
| PH 212     | *GENERAL PHYSICS WITH CALCULUS             | 4     |
| PSY 201    | *GENERAL PSYCHOLOGY                        | 3     |
| or PSY 202 | *GENERAL PSYCHOLOGY                        |       |

**Spring**

| BI 213     | *PRINCIPLES OF BIOLOGY                     | 4     |
| CH 336     | ORGANIC CHEMISTRY                          | 3     |
| PH 213     | *GENERAL PHYSICS WITH CALCULUS             | 4     |
| SOC 204    | *INTRODUCTION TO SOCIOLOGY                | 3     |
| or ANTH 383 | *INTRODUCTION TO MEDICAL ANTHROPOLOGY     |       |
| Bacc Core  |                                          | 3     |

**Third Year**

| BB 345     | INTRODUCTION TO BIOLOGICAL SEQUENCE ANALYSIS | 2     |
| BB 490     | BIOCHEMISTRY 1: STRUCTURE AND FUNCTION      | 3     |
| CH 361     | EXPERIMENTAL CHEMISTRY I                    | 3     |
| CH 440     | PHYSICAL CHEMISTRY                          | 3     |
| Option Elective |                                        | 4     |

**Fall**

| BB 314     | CELL AND MOLECULAR BIOLOGY                 | 4     |
| BB 491     | BIOCHEMISTRY 2: METABOLISM                 | 3     |
| CH 362     | EXPERIMENTAL CHEMISTRY I                   | 3     |

**Winter**

| Z 431 or Z 437 may be taken in place of (BI 331 and BI 341) | 2     |
Biochemistry and Molecular Biology Undergraduate Major (BS, HBS)

Administered by the Department of Biochemistry and Biophysics under the School of Life Sciences.

The BS degree in Biochemistry and Molecular Biology provides a degree path centered on the molecular basis of living systems with training in molecular genetics, biochemistry, and cell biology, as well as in rapidly developing areas such as bioinformatics. Majors must select an option either in Advanced Molecular Biology, Computational Molecular Biology, or Pre-Medicine/Biochemistry and Molecular Biology. The first two options are designed for students interested in careers in the biotechnology and pharmaceutical industries or graduate work in the molecular life sciences, with the second especially well-suited for students interested in computational aspects of molecular biology. The third option is ideal for students interested in careers in medicine and related health professions.

Major Code: 971

Students majoring in Biochemistry and Molecular Biology cannot seek a double major in Biochemistry and Biophysics, Biology, Biohealth Sciences, Botany, Microbiology or Zoology.

Completion of one of the following options is required to earn a degree in Biochemistry and Molecular Biology: Advanced Molecular Biology (p. 991), Computational Molecular Biology (p. 992), or Pre-Medicine/Biochemistry and Molecular Biology (p. 992). For further information, see MyDegrees or the Department of Biochemistry and Biophysics website (https://biochem.science.oregonstate.edu/).

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<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BB 111</td>
<td>INTRODUCTION TO BIOCHEMISTRY AND BIOPHYSICS</td>
<td>1</td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
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<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>CH 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
<td>2</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>CH 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
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<td>Select one of the following:</td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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<td>COMM 114</td>
<td>*ARGUMENT AND CRITICAL DISCOURSE</td>
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<td>COMM 218</td>
<td>*INTERPERSONAL COMMUNICATION</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
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<tr>
<td>CH 334</td>
<td>ORGANIC CHEMISTRY</td>
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<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
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<tr>
<td>Bacc Core Course</td>
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<tr>
<td>BB 317</td>
<td>*SCIENTIFIC THEORY AND PRACTICE</td>
<td>3</td>
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<tr>
<td>CH 336</td>
<td>ORGANIC CHEMISTRY</td>
<td>3</td>
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<tr>
<td>PH 203</td>
<td>*GENERAL PHYSICS</td>
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<tr>
<td>BB 315</td>
<td>MOLECULAR BIOLOGY LABORATORY</td>
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<tr>
<td>BB 490</td>
<td>BIOCHEMISTRY 1: STRUCTURE AND FUNCTION</td>
<td>3</td>
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<tr>
<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
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<tr>
<td>Bacc Core Course</td>
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<tr>
<td>Option Course</td>
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<tr>
<td>Elective</td>
<td>3</td>
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<tr>
<td>BB 491</td>
<td>BIOCHEMISTRY 2: METABOLISM</td>
<td>3</td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4</td>
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<tr>
<td>Bacc Core Course</td>
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<td>Option Course</td>
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<td>Elective</td>
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</table>

**Advanced Molecular Biology Option**

This option is offered within the following major(s):

- Biochemistry and Molecular Biology - College of Science (p. 990)

The Advanced Molecular Biology option is designed for students interested in pursuing graduate work in molecular life sciences or entering the workforce in the biotechnology and pharmaceutical industries. It provides advanced training in genomics, epigenetics and other areas of current research in molecular biology, in addition to the core courses in the major. Students are strongly encouraged to participate in undergraduate research, and up to six research credits can be applied to the Upper-division Science Elective requirements. Faculty advisors work with students to help them identify electives, research opportunities, and professional internships that align with their interests.

**Option Code: 972**

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<thead>
<tr>
<th>Code</th>
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<td>BB 345</td>
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**Core**

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<tr>
<td>BB 360</td>
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<td>3</td>
</tr>
<tr>
<td>BB 361</td>
<td>NEUROSCIENCE OF SENSORY AND MOTOR SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>BB 401</td>
<td>UNDERGRADUATE RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>BB 460</td>
<td>ADVANCED CELL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BB 484</td>
<td>CHROMATIN AND EPIGENETICS</td>
<td>3</td>
</tr>
<tr>
<td>BB 485</td>
<td>APPLIED BIOINFORMATICS</td>
<td>3</td>
</tr>
<tr>
<td>BI 311</td>
<td>GENETICS</td>
<td>3</td>
</tr>
<tr>
<td>BI 445</td>
<td>EVOLUTION</td>
<td>3</td>
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</tbody>
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**Electives**

**Select 19 or more credits from the following:**

19

<table>
<thead>
<tr>
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<td>EVOLUTION</td>
<td>3</td>
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</tbody>
</table>
Computational Molecular Biology Option

This option is designed for students interested in the interface of molecular biology, computer science, and statistics. It provides strong preparation for graduate school in computational biology as well as the biotechnology and pharmaceutical industry workforce. This option couples the comprehensive core training in biochemistry and molecular biology with advanced course work in mathematics, statistics, computer science, and bioinformatics. Students are strongly encouraged to participate in undergraduate research, and up to six research credits can be applied to the Upper-division Science Elective requirements. Faculty advisors work with students to identify elective courses, undergraduate research opportunities, and professional internships that support their individual interests.

Option Code: 974

Pre-Medicine/Biochemistry and Molecular Biology Option

This option is offered within the following major(s):

• Biochemistry and Molecular Biology - College of Science (p. 990)

Biochemistry and Molecular Biology students interested in a career in medicine should choose this option. It may also be suitable for students interested in some other health professions and these students should first consult with their advisor. In addition to offering a rigorous foundation in biochemistry, molecular and cellular biology, chemistry, and genetics, the Pre-medicine option meets the requirements for most medical schools in the U.S. by providing students with training in psychology, ethics and social sciences. Students have a wide choice of medically relevant electives in areas such as physiology, microbiology, and immunology. Students are strongly encouraged to participate in undergraduate research. Faculty pre-med advisors guide students to integrate undergraduate research and other relevant professional opportunities into their undergraduate experience and to prepare themselves as strong candidates for admission to the professional schools of their interest.
Integrative Biology

The Department of Integrative Biology (IB) is part of the School of Life Sciences and receives support for its academic program from the College of Science. In addition to the faculty’s activities in research and service, it has teaching responsibilities in the Biology and Zoology majors and Biology minor, as well as courses taken by nearly every undergraduate major at Oregon State University (OSU).

Undergraduate Degrees

IB offers undergraduate BS degrees in Biology and Zoology. The undergraduate Biology major was created for students who wish to obtain broad, interdisciplinary training in the biological sciences. Biology is a common destination for students interested in health professions and provides excellent training for graduate programs in the life sciences. It also offers undergraduate options in Ecology, Genetics, Marine Biology, Pre-Dentistry, Pre-Education, Pre-Medicine, and Pre-Veterinary Medicine. The Zoology major prepares students for a wide range of careers from animal care to research. Both majors benefit from the wealth of departmental course offerings and faculty field and laboratory research. Because of the interdisciplinary nature of the program, students majoring in Biology or Zoology cannot seek a dual major or double degree in both majors or in the BioHealth Sciences and Fisheries and Wildlife majors.

Graduate Programs

IB is a vertically integrated department with an internationally recognized graduate program. Faculty work at the level of the cell, organism, and community and have expertise in areas of behavioral ecology, marine biology and ecology, disease ecology, evolutionary biology, conservation biology, environmental physiology, population genetics, genomics, chemical ecology, cell and developmental biology, symbiosis and paleobiology. Detailed information on the graduate faculty and program is available from the Department of Integrative Biology website. IB offers MS and PhD degrees.

Biology Major Field Test

Biology and Zoology majors are required to take a comprehensive, two-hour Biology Major Field Test in order to graduate. Further information can be found on the department website (http://ib.oregonstate.edu/advising/MFT-info/).

Undergraduate Programs

Majors

- Biology (p. 1003)
  - Options:
    - Ecology
    - Genetics
    - Marine Biology
    - Physiology and Biology
    - Pre-Dentistry/Biology
    - Pre-Education

- Pre-Medicine/Biology
- Pre-Veterinary Medicine
- Zoology (p. 1015)

Minors

- Biology (p. 1003)
- Marine Biology and Ecology (p. 1015)

Faculty

Professors Blaustein, Blouin, De Leenheer, Denver, Giebultowicz, Hacker, Lubchenco, Lytle, Maddison, Mason, Menge, Sponaugle, Warrick, Weis
Associate Professors Chan, Jolles, Novak, Terry
Associate Professor, Senior Research Henkel
Assistant Professors Barreto, Burke, Dalziel, Strother
Assistant Professors, Senior Research Grorud-Colvert, Milligan
Senior Instructors 2 Blair, Lavery
Senior Instructors 1 Bouwma, Cheung, Kayes, Quick
Instructors Biga, Chouinard, Harjoe, Kirk, Landys, Rose
Professional Faculty Duncan, Leong-Kee, Marshall, McLeod, Olarra

Biology

BI LD1. GENERAL CREDIT. (1-16 Credits)
BI LD2. GENERAL CREDIT. (1-16 Credits)
BI 101. *ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE. (4 Credits)
Introduction to ecosystems, including biodiversity, species interactions, human impacts, and conservation biology. Lectures introduce biological themes and research in the context of current issues in science and society. Hands-on laboratories focus on using organisms and technologies to explore biology and develop skills for lifelong learning. No previous science courses are required, intended for non-biological science majors. This course can be taken alone or in any combination with BI 102 or 103. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
BI 102. *ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE. (4 Credits)
Introduction to how genetics shapes life on Earth, including how understandings of DNA and environmental factors are leading to biotechnological advances. Lectures introduce biological themes and research in the context of current issues in science and society. Hands-on laboratories focus on using organisms and technologies to explore biology and develop skills for lifelong learning. No previous science courses are required, intended for non-biological science majors. This course can be taken alone or in any combination with BI 101 and BI 103. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BI 102H

BI 103. *HUMAN BIOLOGY. ANATOMY, PHYSIOLOGY AND DISEASE. (4 Credits)
Introduction to the biology of humans, including aspects of human health and disease. Lectures introduce biological themes and research in the context of current issues in science and society. Hands-on laboratories focus on using organisms and technologies to explore biology and develop skills for lifelong learning. No previous science courses are required, intended for non-biological science majors. This course can be taken alone or in any combination with BI 101 and BI 102. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BI 103H

BI 109. HEALTH PROFESSIONS: MEDICAL. (1 Credit)
Discussion of matters relating to a medical career. Includes application procedures, the importance of various requirements, admissions, professional school curricula, financing education, and related matters. Speakers are included. Graded P/N.

BI 111. INTRODUCTION TO MARINE LIFE IN THE SEA: MARINE HABITATS. (1 Credit)
A field-focused learning experience exploring the varied marine life and habitats on the Oregon coast, including rocky shores, sandy beaches, mud flats, bays and estuaries. Students will also be introduced to the breadth of marine science course offerings and research at Oregon State University’s Hatfield Marine Science Center located in Newport, Oregon. Graded P/N.

BI 150. INTRODUCTION TO MARINE BIOLOGY. (3 Credits)
Survey of marine organisms, the environments they inhabit, and their evolutionary adaptations for thriving in those environments. The course will also highlight current conservation challenges that threaten marine life, such as climate change, overfishing, and pollution.

BI 175. *GENOMES, IDENTITIES AND SOCIETIES. (3 Credits)
DNA’s roles in shaping our senses of identity, individuality, and societal interconnectedness will be analyzed. New advances in genetic technology will be explored, along with their potential impacts on society. The relationships between genetics and discrimination will be examined with focus on cases from Oregon, America, and the world. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

BI 197. PROFESSIONAL DEVELOPMENT I: HEALTH PROFESSIONS. (1 Credit)
Integrative Biology faculty and other professionals introduce a variety of human health professions including dentistry, medicine, pharmacy and others (veterinary medicine students take BI 198). Emphasizes professional development through exploring relevant social and cognitive concepts, as well as engaging in experiential learning and networking. Departmental and campus student success resources are highlighted. Graded P/N.

BI 198. PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY. (1 Credit)
Integrative Biology faculty and biology professionals introduce life science careers outside of human health professions (human health professions students take BI 197). Emphasizes professional development through exploring relevant social and cognitive concepts, as well as engaging in experiential learning and networking. Departmental and campus student success resources are highlighted. Graded P/N.

BI 199. SELECTED TOPICS. (1-16 Credits)
Field Ecology.
Equivalent to: BI 199H
This course is repeatable for 16 credits.

BI 199H. SELECTED TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 199
This course is repeatable for 16 credits.

BI 204. *INTRODUCTORY BIOLOGY I. (4 Credits)
Foundations of biological sciences including scientific inquiry, genetics, evolution, and ecology. Significant emphasis throughout on the application of core concepts to solve human and environmental problems. Laboratory emphasizes skills in critical thinking, scientific writing, and experimental design. Not intended for pre-health profession students. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

BI 205. *INTRODUCTORY BIOLOGY II. (4 Credits)
Fundamental concepts in molecular and cellular biology, beginning with biomolecules and the origin of life, and ending with genomics. Significant emphasis throughout on applications of biotechnology to solve human problems. Laboratory emphasizes skills in critical thinking, scientific writing, and experimental design. Not intended for pre-health profession students. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

Prerequisites: CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or ((CH 231 (may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) [D-] or CH 261H (may be taken concurrently) [D-] or CH 271 (may be taken concurrently) [D-] or CH 271H (may be taken concurrently) [D-])))
BI 206. *INTRODUCTORY BIOLOGY III. (4 Credits)
Basic plant and animal physiology from an evolutionary perspective. Significant emphasis on topics of importance to human society, including human and plant disease. Laboratory emphasizes skills in critical thinking, scientific writing, and experimental design. Not intended for pre-health professional students. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Prerequisites: CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or ((CH 231 (may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) D-) or CH 271H (may be taken concurrently) D-) or CH 271 (may be taken concurrently) D-]])

BI 211. *PRINCIPLES OF BIOLOGY. (4 Credits)
Origins of life, energy transformations, plant and animal diversity. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BI 211H
BI 211H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Origins of life, energy transformations, plant and animal physiology. Lec/ lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: BI 211
BI 212. *PRINCIPLES OF BIOLOGY. (4 Credits)
Cell biology, organ systems, plant and animal physiology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Prerequisites: (CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or CH 221 (may be taken concurrently) with D- or better or CH 224H (may be taken concurrently) with D- or better or ((CH 231 (may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) D-) or CH 271H (may be taken concurrently) D-) or CH 271 (may be taken concurrently) D-]]))
Equivalent to: BI 212H
BI 212H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Cell biology, organ systems, plant and animal physiology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Prerequisites: (CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or CH 221 (may be taken concurrently) with D- or better or CH 224H (may be taken concurrently) with D- or better or ((CH 231 (may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) D-) or CH 271H (may be taken concurrently) D-) or CH 271 (may be taken concurrently) D-]]))
Equivalent to: BI 212
BI 213. *PRINCIPLES OF BIOLOGY. (4 Credits)
Genetics, evolution, natural selection, and ecology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Prerequisites: CH 121 with D- or better or CH 201 with D- or better or CH 221 with D- or better or CH 224H with D- or better or ((CH 231 with D- or better or CH 231H with D- or better) and (CH 261 D-) or CH 261H D-) or CH 271 D-])
Equivalent to: BI 213H
BI 213H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Genetics, evolution, natural selection, and ecology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Prerequisites: CH 121 with D- or better or CH 201 with D- or better or CH 221 with D- or better or CH 224H with D- or better or ((CH 231 with D- or better or CH 231H with D- or better) and (CH 261 D-) or CH 261H D-) or CH 271 D-])
Equivalent to: BI 213

BI 231. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The first of a three-term introductory series. Using a strong gross anatomy focus, course topics address fundamental concepts of biology as they apply to human anatomy and physiology and then focus on understanding the structures, functions, and regulatory mechanisms involved in the human skeleton, muscular and integumentary systems. BI 231 is a required prerequisite to BI 232 and BI 233. The BI 241 Lab is optional but prerequisite for either of the subsequent BI 242 or BI 243 lab courses in the series. Lec.
BI 232. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The second of a three-term introductory series. Using a strong gross anatomy focus, course topics address the structures, functions and regulatory mechanisms involved in the human nervous, endocrine and reproductive systems. Lec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better
BI 233. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The third of a three-term introductory series. Using a strong gross anatomy focus, course topics address the structures, functions, and regulatory mechanisms involved in the human cardiovascular, respiratory, urinary and digestive systems. Lec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better
BI 241. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The first of a three-term introductory series. Using the human cadaver (prosection), course topics address fundamental concepts of biology as they apply to human anatomy and physiology and then focus on understanding the structures, functions, and regulatory mechanisms involved in the human skeletal, muscular and integumentary systems. Physiology demonstrations illustrate functions of organ systems. Lab/rec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better
BI 242. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The second of a three-term introductory series. Using the human cadaver (prosection) and dissection of preserved specimens with a strong gross anatomy focus, course topics address the structures, functions and regulatory mechanisms involved in the nervous, endocrine and reproductive systems. Physiology demonstrations illustrate functions of organ systems. Lab/rec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better and BI 232 (may be taken concurrently) C- and BI 241 (may be taken concurrently) C-]
BI 243. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The third of a three-term introductory series. Using the human cadaver (prosection) and dissection of preserved specimens with a strong gross anatomy focus, course topics address the structures, functions, and regulatory mechanisms involved in the human cardiovascular, respiratory, urinary and digestive systems. Physiology demonstrations illustrate functions of organ systems. Lab/rec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better and BI 233 (may be taken concurrently) [C-] and BI 241 (may be taken concurrently) [C-]
Equivalent to:
Recommended:
Attributes:
This course is repeatable for 6 credits.

BI 298. PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II. (1 Credit)
Students will develop awareness of the elements of professional development, identify strategic areas for growth, and design an exploration plan. Emphasis is being placed on being able to analyze career opportunities to determine the best mix of technical and professional skills needed for success as a biological science professional. Graded P/N.
Equivalent to: BI 298H

BI 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BI 301. *HUMAN IMPACTS ON ECOSYSTEMS. (3 Credits)
Selected human impacts on ecosystems are examined in depth, including air quality, global climate change, management of agricultural and forest resources, and threats to biological diversity. The causes, approaches to investigating, and potential solutions for each issue are discussed from a scientific and social perspective. Adverse effects on ecosystems that result from each environmental problem are examined. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: One year of college biology or chemistry

BI 306. **ENVIRONMENTAL ECOLOGY. (3 Credits)
Biological, physical, and chemical nature of both natural and human-disturbed ecosystems. Topics include population and conservation ecology, toxins in the food chain and in the environment, forest decline and acid rain, eutrophication of terrestrial and aquatic ecosystems, and ecosystem restoration. Offered alternate years. (Bacc Core Course)
(]Writing Intensive Course)
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC
Equivalent to: BI 306H
Recommended: One year of college biology and chemistry.

BI 306H. **ENVIRONMENTAL ECOLOGY. (3 Credits)
Biological, physical, and chemical nature of both natural and human-disturbed ecosystems. Topics include population and conservation ecology, toxins in the food chain and in the environment, forest decline and acid rain, eutrophication of terrestrial and aquatic ecosystems, and ecosystem restoration. Offered alternate years. (Bacc Core Course)
(]Writing Intensive Course)
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: BI 306
Recommended: One year of college biology and chemistry

BI 309. TEACHING PRACTICUM. (1-6 Credits)
Introductory experience for students assisting with instruction in Biology or Zoology courses. Admission is by application. See Cordley 3029 for details.
This course is repeatable for 6 credits.

BI 311. GENETICS. (4 Credits)
Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics. Lec/rec.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: BI 311H

BI 311H. GENETICS. (4 Credits)
Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: BI 311

BI 315. MOLECULAR BIOLOGY LABORATORY. (3 Credits)
Laboratory projects exploring the transmission of genetic information from storage to function will introduce students to fundamental molecular biology concepts and techniques, including isolation of DNA, construction of recombinant plasmids, quantification of gene expression in model organisms, polymerase chain reaction, and analysis of protein expression and subcellular localization. Lec/lab. CROSSLISTED as BB 315/BI 315.
Prerequisites: BB 314 (may be taken concurrently) with C- or better or BB 314H (may be taken concurrently) with C- or better
Equivalent to: BB 315

BI 317. *SCIENTIFIC THEORY AND PRACTICE. (3 Credits)
Teaches students the practice of biological science. Topics cover scientific theory, communications, ethics and critical evaluation. CROSSLISTED as BB 317/BI 317. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: BB 317

BI 319. *CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES. (3 Credits)
Teaches students the practice of biological science. Topics cover scientific theory, written and spoken communications, ethics and critical evaluation. (Writing Intensive Course) CROSSLISTED as Z 319.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (ST 351 [D-] or ST 351H [D-] or ST 352 [D-]) and (ST 351 [D-] or ST 351H [D-])
Equivalent to: Z 319

BI 331. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The first of a three-term advanced series. With a strong focus on the physiological underpinnings of disease, course topics address the fundamental concepts of human anatomy and physiology and then focus on understanding the structures, functions, regulatory mechanisms and common pathologies involved in the skeletal, muscular and integumentary systems. Lec.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (CH 123 [C-] or (CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-]) and (BI 341 [D-] or BI 341H [D-])

BI 332. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The second of a three-term advanced series. With a strong focus on the physiological underpinnings of disease, course topics address the structures, functions, and regulatory mechanisms involved in the nervous, endocrine and reproductive systems. Lec. 
**Prerequisites:** BI 331 with C- or better and BI 342 (may be taken concurrently) [C-] 

BI 333. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The third part of a three-term advanced series. With a strong focus on the physiological underpinnings of disease, course topics address the structures, functions, and regulatory mechanisms involved in the cardiovascular, respiratory, urinary and digestive systems. Lec. 
**Prerequisites:** BI 332 with C- or better and BI 343 (may be taken concurrently) [C-] 

BI 341. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The first of a three-term advanced series. Using the human cadaver (prosection) and physiological data acquisition equipment, course topics address the fundamental concepts of human anatomy and physiology and then focus on understanding the structures, functions, regulatory mechanisms and common pathologies involved in the human skeletal, muscular and integumentary systems. Lab. 
**Corequisites:** BI 331 

BI 342. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The second of a three-term advanced series. Using the human cadaver (prosection), dissection of preserved specimens, and physiological data acquisition equipment, course topics address the structures, functions, regulatory mechanisms and common pathologies involved in the human cardiovascular, respiratory, urinary and digestive systems. Lab. 
**Corequisites:** BI 332 

BI 343. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The third of a three-term advanced series. Using the human cadaver (prosection), dissection of preserved specimens, and physiological data acquisition equipment, course topics address the structures, functions, regulatory mechanisms and common pathologies involved in the human cardiovascular, respiratory, urinary and digestive systems. Lab. 
**Corequisites:** BI 333 

BI 345. *INTRODUCTION TO EVOLUTION. (3 Credits) 
Elements of evolutionary theory; origin and history of life; evolutionary controversy; origins of species, sex, and humans. (Bacc Core Course) 
**Attributes:** CSST – Core, Synthesis, Science/Technology/Society 
**Equivalent to:** Z 345 

BI 347. *OCEANS IN PERIL. (3 Credits)
The interactions of society and the marine environment, emphasizing the ecological, biogeochemical, economic, sociological, and political significance of the oceans. Topics of current critical importance will include marine biodiversity, fisheries and aquaculture, ocean energy, biogeochemical change, global warming, ocean acidification, and sea level rise. Lecture (Bacc Core Course). 
**Attributes:** CSST – Core, Synthesis, Science/Technology/Society 
**Prerequisites:** BI 101 with C- or better or BI 102 with C- or better or BI 211 with C- or better or BI 211H with C- or better or BI 213 with C- or better or BI 213H with C- or better or BI 204 with C- or better or BI 150 with C- or better 

BI 348. *HUMAN ECOLOGY. (3 Credits)
The impact of humans on the environment, emphasizing the political, sociological, and ecological consequences of human population growth. Topics of current critical importance will include global warming trends, destruction of the ozone layer, consequences of pollution, habitat destruction, the loss of biodiversity, and conservation biology. (Bacc Core Course) 
**Attributes:** CSST – Core, Synthesis, Science/Technology/Society 
**Equivalent to:** Z 348 

BI 351. MARINE ECOLOGY. (3 Credits) 
Ecological interactions and principles in different marine habitats. Topics include the organisms (plants, invertebrates, vertebrates) found in major habitats and interactions between organisms. Habitats discussed include coral reefs, rocky shores, kelp forests, near-shore waters, open-ocean waters, and the deep sea. Emphasis is placed on how organism-organism interactions produce varying patterns of distribution, abundance, body size, diversity, stability, and succession. 
**Prerequisites:** ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) 
**Equivalent to:** Z 351 

BI 353. PACIFIC NORTHWEST COASTAL ECOSYSTEMS. (4 Credits)
A field-based introduction to the diversity of ecosystems of the Pacific Northwest coast. Biological and physical processes affecting the distribution, structure, community composition and physical features of these systems are explored through a variety of lectures and field trips. Ecosystem services and human impacts are examined. 
**Prerequisites:** ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) 

BI 358. SYMBIOSES AND THE ENVIRONMENT. (3 Credits)
Overview of the diversity of mutualistic symbioses and their roles in the natural environment. Integrative approach, from ecosystem to molecule, to the examination of certain key mutualisms. Lec. Offered alternate years. 
**Prerequisites:** (( (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 123 [C-] or CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-]) 

BI 370. ECOLOGY. (3 Credits)
The study of interactions between organisms and their biotic and abiotic environments at the population, community, ecosystem, and biosphere levels of organization. 
**Prerequisites:** ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) 
**Equivalent to:** BI 370H 

BI 370H. ECOLOGY. (3 Credits) 
The study of interactions between organisms and their biotic and abiotic environments at the population, community, ecosystem, and biosphere levels of organization. 
**Attributes:** HNRS – Honors Course Designator 
**Prerequisites:** ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) 
**Equivalent to:** BI 370
BI 371. *ECOLOGICAL METHODS. (3 Credits)
Experimental design, data collection, analysis and synthesis in ecological studies; local ecosystems emphasized. May have field trip fee. Lec/lab.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: BI 370 with D- or better or BI 370H with D- or better

BI 373. FIELD METHODS IN MARINE ECOLOGY. (3 Credits)
Exposure to research methods used in field studies of the marine rocky intertidal ecosystem. Research projects and writing exercises provide students with hands-on experience of collecting, analyzing, and presenting marine ecological data. Field trip fee. Lab fee. Lec/lab.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 351 (may be taken concurrently) with D- or better or BI 370 with D- or better or BI 370H with D- or better) and (ST 351 [D-] or ST 351H [D-])
Recommended: ST 352

BI 375. FIELD METHODS IN ECOLOGICAL RESTORATION. (4 Credits)
Observation and application of theory and practice in ecological restoration. Using site visits and hands-on research, explores the roles in restoration of fire, local adaptation, disturbance history, natural history, beaver, and soils, including visits to several active and completed restoration projects and overnights in the field. Lab.
Prerequisites: ([BI 211 with C- or better or BI 211H with C- or better] and [BI 212 [C-] or BI 212H [C-] or BI 213 [C-] or BI 213H [C-]] or [BI 204 [C-] and BI 205 [C-] and BI 206 [C-]])

BI 399. SPECIAL TOPICS. (0-16 Credits)
May be repeated for 16 total credits.
Equivalent to: BI 399H
This course is repeatable for 16 credits.

BI 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: BI 401H
This course is repeatable for 16 credits.

BI 401H. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 401
This course is repeatable for 16 credits.

BI 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BI 405H
This course is repeatable for 16 credits.

BI 406. PROJECTS: CURATORIAL ASSISTANT. (1-6 Credits)
Students assist with curatorial projects in OSU biological collections. Admission is by application. See Cordley 3029 for details.
This course is repeatable for 6 credits.

BI 407. SEMINAR. (1 Credit)
Departmental seminar. Graded P/N.
Equivalent to: BI 407H, BI 407H, BOT 407, BOT 407H
This course is repeatable for 16 credits.

BI 407H. SEMINAR. (1 Credit)
Departmental seminar. Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 407
This course is repeatable for 16 credits.

BI 409. ADVANCED TEACHING PRACTICUM. (1-6 Credits)
Advanced practicum experience for students assisting in Biology or Zoology courses. Includes advanced training in course content and development of instructional materials. Admission is by application. See Cordley 3029 for details.
This course is repeatable for 6 credits.

BI 410. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BI 420. *VIRUSES IN MODERN SOCIETY. (3 Credits)
Impact of viruses on modern civilization. Molecular mechanisms of viral infectivity. Approaches to the prevention and cure of viral diseases. Role of viruses in agriculture and industry. Offered alternate years. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: BI 311 with D- or better or BI 311H with D- or better or BI 314 with D- or better or BI 314H with D- or better

BI 427. PALEOBIOLOGY. (4 Credits)
Fossils provide a direct window into the evolution, extinction, and ecology of past life on Earth. A process-based study of the marine and terrestrial fossil record is taken to explore the topics of preservation, macroevolution, extinction of biotas, biomechanics, paleoecology, and climate change. Required laboratory and weekend field trip.
Prerequisites: ([BI 211 with C- or better or BI 211H with C- or better] and [BI 212 [C-] or BI 212H [C-] or BI 213 [C-] or BI 213H [C-] or BI 204 [C-] and BI 205 [C-] and BI 206 [C-]])
Equivalent to: Z 427

BI 445. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Prerequisites: BI 311 with D- or better or BI 311H with D- or better
Equivalent to: BI 445H

BI 445H. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Attributes: HNRS – Honors Course Designator
Prerequisites: BI 311 with D- or better or BI 311H with D- or better
Equivalent to: BI 445

BI 450. ^MARINE BIOLOGY AND ECOLOGY. (15 Credits)
A comprehensive lecture and laboratory introduction to the flora and fauna of the marine environment approached from the level of the organism to ecosystem. Ecological patterns and processes characteristic of marine communities will be emphasized. Lec/lab. Taught at Hatfield Marine Science Center, Newport, OR. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 370 with D- or better or BI 370H with D- or better) and (ST 351 [D-] or ST 351H [D-])
Recommended: ST 352
BI 451. FUNCTIONAL ANATOMY OF THE HUMAN MUSCULAR SYSTEM. (4 Credits)
In-depth dissection of the orientation, innervation, and functional significance of muscles and muscle groups. Topics include muscle identification, joint anatomy and variation of human form. BI 551 student expectations include vascularization and detailed joint anatomy. The laboratory component will consist of the dissection of the muscular anatomy of a human cadaver. Lab fee. Lec/lab.
Prerequisites: ([BI 231 with D- or better and BI 241 [D-]) or (BI 331 [D-] and BI 341 [D-]) and (BI 232 [D-] and BI 242 [D-]) or (BI 332 [D-] and BI 342 [D-]) and (BI 233 [D-] and BI 234 [D-]) or (BI 333 [D-] and BI 343 [D-]))
Equivalent to: Z 451

BI 456. PHYLOGENETICS. (4 Credits)
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Prerequisites: (ST 351 with D- or better or ST 351H with D- or better) and (ST 352 (may be taken concurrently) [D-] or ST 411 (may be taken concurrently) [D-]) and (BI 311 [D-] or BI 311H [D-] or BI 445 [D-] or BI 445H [D-])

BI 481. BIOGEOGRAPHY. (3 Credits)
Biogeography is the study of the distribution of biodiversity. We focus on abiotic (geological, climatological) and biotic (ecological, evolutionary) factors that govern diversity across space and through time, emphasizing assembly of communities, global change, and conservation in today's rapidly changing world. The course format includes lecture, computer-based activities, and discussion. Offered winter term in odd years.
Prerequisites: BI 370 with D- or better or BI 370H with D- or better
Equivalent to: Z 481

BI 483. POPULATION BIOLOGY. (3 Credits)
Theoretical and empirical views of the structure and function of populations from across the tree of life, emphasizing the integration of ecological and evolutionary approaches. Lec.
Prerequisites: (MTH 241 with D- or better or MTH 251 with D- or better or MTH 251H with D- or better or MTH 227 with D- or better) and (ST 351 [D-] or ST 351H [D-]) and (ST 352 (may be taken concurrently) [D-] or ST 411 (may be taken concurrently) [D-]) and (BI 311 [D-] or BI 311H [D-] or BI 370 [D-] or BI 370H [D-])

BI 485. MONSTER BIOLOGY. (3 Credits)
Scientists seek to explain what exists and why things are. An alternative approach is to ask why things are not. Biological and physical laws are used to critically and rigorously assess why monsters from literature, television and film are not possible in the real world.
Prerequisites: (BI 311 (may be taken concurrently) with D- or better or BI 311H (may be taken concurrently) with D- or better) and (BI 370 (may be taken concurrently) [D-] or BI 370H (may be taken concurrently) [D-])

BI 495. DISEASE ECOLOGY. (3 Credits)
An introduction to disease ecology—the study of disease processes in natural populations and communities. The course focuses on (I) the role parasites play in the ecology and evolution of animal populations, including humans; and (II) the relevance of ecological and evolutionary considerations in managing infectious diseases.
Prerequisites: BI 370 with C- or better or BI 370H with C- or better

BI 498. SENIOR BIOLOGY FIELD TEST. (0 Credits)
A comprehensive, two-hour exam to assess the biological knowledge of Biology and Zoology seniors. Students must complete the exam in their final undergraduate term or during spring term if graduating during summer when it is not offered. A pass will be given to all students who complete the exam. More details at http://ib.oregonstate.edu/advising/MFT-info.

BI 499. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
Equivalent to: BI 499H
BI 499H. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary.
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 499
This course is repeatable for 16 credits.

Integrative Biology
IB 501. RESEARCH. (1-16 Credits)
Graduate-level research completed under faculty supervision.
Equivalent to: Z 501
This course is repeatable for 16 credits.

IB 503. THESIS. (1-16 Credits)
Master's thesis, completed under faculty supervision.
Equivalent to: Z 503
This course is repeatable for 999 credits.

IB 505. READING AND CONFERENCE. (1-16 Credits)
For graduate students working toward a master's degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest.
Equivalent to: Z 505
This course is repeatable for 16 credits.

IB 506. PROJECTS: OUTREACH. (1-16 Credits)
Graded P/N.
Equivalent to: BI 506
This course is repeatable for 16 credits.

IB 507. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: Z 507
This course is repeatable for 16 credits.

IB 510. INTERNSHIP. (1-16 Credits)
Equivalent to: Z 510
This course is repeatable for 16 credits.

IB 511. INTEGRATIVE BIOLOGY GRADUATE STUDENT ORIENTATION. (2 Credits)
Introduction to the graduate program in Integrative Biology and at OSU in general. Class introduces students to various skills for success in graduate school and beyond. Exploration of career options for those holding a degree in IB are explored. Graded P/N.

IB 512. INTEGRATIVE BIOLOGY GTA TRAINING AND DEVELOPMENT. (1 Credit)
Provides instructional support and professional development for first year graduate teaching assistants (GTAs) in Integrative Biology. Focuses on developing a foundation for quality instruction, facilitation, and leadership as GTAs and professionals. Best practices, skills, theory and knowledge necessary for effective teaching, facilitation, and assessment of student learning are explored.
This course is repeatable for 3 credits.
IB 513. GRANT WRITING AND ETHICS. (3 Credits)
Participants will write and submit a grant proposal by the end of the term. We discuss the main components of a typical grant proposal. Participants read and critique proposal drafts written by participants. Ethical issues are discussed as they are encountered.
Equivalent to: Z 585
This course is repeatable for 6 credits.

IB 515. SCIENCE COMMUNICATION: MAKING YOUR SCIENCE MATTER. (2 Credits)
A practical, hands-on course designed to help science graduate students build knowledge and skills for engaging with audiences beyond their scientific peers. The science of science communication, the cultures of journalism and public policy, the changing roles of scientists in society, and science advocacy will be explored through lectures, invited talks, in-class discussions and exercises.

IB 518. SCIENCE AND POLICY. (2 Credits)
An introduction to the science-policy interface in a 'post-truth' society. The formulation of state and federal public policy is examined, as well as and role of science and scientist in informing policy, management decisions and public understanding. Current topics are emphasized.

IB 522. COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY. (5 Credits)
Phylogenetically-based study of the form and function of vertebrate organ systems, including integumentary, musculoskeletal, cardiopulmonary, digestive, and sensory. Lab emphasizes comparative form through dissection, and function through non-invasive experimentation. Lec/lab.
Equivalent to: Z 522

IB 523. ENVIRONMENTAL PHYSIOLOGY. (3 Credits)
Comparative environmental physiology of animals with emphasis on adaptations to such aspects of the physical environment as temperature, water, ions, and gases. Consideration given to interactions between physiology and environment that influence the local and geographic distribution of animals.
Equivalent to: Z 523

IB 525. EMBRYOLOGY AND DEVELOPMENT. (5 Credits)
Equivalent to: Z 525

IB 527. PALEOBIOLOGY. (0-4 Credits)
Fossils provide a direct window into the evolution, extinction, and ecology of past life on Earth. A process-based study of the marine and terrestrial fossil record is taken to explore the topics of preservation, macroevolution, extinction of biotas, biomechanics, paleoecology, and climate change. Required laboratory and weekend field trip.
Equivalent to: BI 527

IB 531. VERTEBRATE PHYSIOLOGY I. (4 Credits)
Systems/concepts covered include motor reflexes, autonomic nervous system, digestion/metabolism, renal and osmoregulatory, endocrine and reproductive systems. First in IB 531, IB 532 series.

IB 532. VERTEBRATE PHYSIOLOGY II. (3 Credits)
Systems/concepts covered include blood, immune, lymphatic, cardiovascular, and pulmonary. Second in the IB 531, IB 532 series.
Equivalent to: Z 532

IB 537. VERTEBRATE ENDOCRINOLOGY. (4 Credits)
An exploration of vertebrate endocrinology that examines principles of hormone action, inter- and intracellular signaling mechanisms within endocrine axes, and comparative endocrine physiology, emphasizing concepts of homeostasis and methodologies for evaluating normal and physiological function. Students are provided multiple forums for class participation, in the form of scientific presentations and 'mini-reports.'
Equivalent to: Z 537

IB 538. BEHAVIORAL NEUROBIOLOGY. (3 Credits)
Equivalent to: Z 538

IB 540. INSECT PHYSIOLOGY. (3 Credits)
Fundamentals of insect physiology from the behavioral to the molecular level. Cellular physiology and hormonal control of molting, metamorphosis and reproduction. Overview of body functions: respiration, circulation, digestion, metabolism, and osmoregulation. Physiological basis of behavior: muscles and flight, structure and functions of the nervous system, sensory physiology and chemical communication. The contributions of insect physiology to general physiological principles and biorational methods of insect pest control are discussed.
Equivalent to: Z 540

IB 545. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Equivalent to: BI 545

IB 551. FUNCTIONAL ANATOMY OF THE HUMAN MUSCULAR SYSTEM. (4 Credits)
In-depth dissection of the orientation, innervation, and functional significance of muscles and muscle groups. Topics include muscle identification, joint anatomy and variation of human form. IB 551 student expectations include vascularization and detailed joint anatomy. The laboratory component will consist of the dissection of the muscular anatomy of a human cadaver. Lab fee. Lec/lab.
Equivalent to: BI 551
Recommended: [(BI 231 and 241) or (BI 331 and 341)] and [(BI 232 and 242) or (BI 332 and 342)] and [(BI 233 and 243) or (BI 333 and 343)]

IB 556. PHYLOGENETICS. (4 Credits)
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Equivalent to: BI 556

IB 561. MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY. (4 Credits)
Comparative survey of eight major invertebrate phyla and many lesser-known phyla. Areas of emphasis will be 1) invertebrate identification, 2) natural history (diversity, habitat, feeding, behavior), and 3) comparative anatomy (adaptive significance of morphological structures). Laboratories and field trips will strongly supplement lecture material. Lec/lab. Taught at Hatfield Marine Science Center.
Equivalent to: Z 561
IB 573. HERPETOLOGY. (3 Credits)
World families and distribution of amphibians and non-avian sauropods; evolution, population biology, life histories, current literature.
Equivalent to: Z 573

IB 574. SYSTEMATIC HERPETOLOGY. (2 Credits)
A survey of the phylogenetic diversity of amphibians and reptiles of the United States. Identification through the use of keys will be stressed. Field trip fee. Lab fee. Lec/lab.
Equivalent to: Z 574

IB 577. AQUATIC ENTOMOLOGY. (4 Credits)
Biology, ecology, collection, and identification of aquatic insects. Two required Saturday field trips. Lec/lab.
Equivalent to: Z 577

IB 581. BIOGEOGRAPHY. (3 Credits)
Biogeography is the study of the distribution of biodiversity. We focus on abiotic (geological, climatological) and biotic (ecological, evolutionary) factors that govern diversity across space and through time, emphasizing assembly of communities, global change, and conservation in today's rapidly changing world. The course format includes lecture, computer-based activities, and discussion. Offered winter term in odd years.
Equivalent to: BI 581

IB 583. POPULATION BIOLOGY. (3 Credits)
Theoretical and empirical views of the structure and function of populations from across the tree of life, emphasizing the integration of ecological and evolutionary approaches. Lec.
Equivalent to: BI 583

IB 592. THEORETICAL ECOLOGY. (4 Credits)
A treatment of the central concepts of theoretical ecology, with emphasis on the analysis and modeling of single populations and multispecies communities. Topics include discrete- and continuous-time models of population growth, stochastic and deterministic processes, and the response of populations and communities to pulse and press perturbations.
Equivalent to: BI 592

IB 593. BEHAVIORAL ECOLOGY. (5 Credits)
Behavioral ecology with emphasis on both theoretical and empirical approaches. Offered alternate years.
Equivalent to: Z 593

IB 594. COMMUNITY ECOLOGY. (5 Credits)
Theory and analysis of multispecies associations. Emphasis on extent to which existing ecological theory is supported by natural phenomena. Course considers how biotic and abiotic mechanisms interact to regulate community organization and stability in marine, freshwater, and terrestrial habitats. Offered alternate years.
Equivalent to: Z 594

IB 595. DISEASE ECOLOGY. (3 Credits)
An introduction to disease ecology—the study of disease processes in natural populations and communities. The course focuses on (I) the role parasites play in the ecology and evolution of animal populations, including humans; and (II) the relevance of ecological and evolutionary considerations in managing infectious diseases.
Equivalent to: BI 595

IB 599. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary. Grading mode TBA. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: Z 599
This course is repeatable for 16 credits.

IB 601. RESEARCH. (1-16 Credits)
Doctoral-level research under faculty supervision. Graded P/N.
Equivalent to: Z 601
This course is repeatable for 16 credits.

IB 603. THESIS. (1-16 Credits)
Doctoral thesis completed under faculty supervision.
Equivalent to: Z 603
This course is repeatable for 999 credits.

IB 605. READING AND CONFERENCE. (1-16 Credits)
For graduate students working toward doctoral degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest.
Equivalent to: Z 605
This course is repeatable for 16 credits.

Zoology
Z 349. *BIODIVERSITY. CAUSES, CONSEQUENCES, AND CONSERVATION. (3 Credits)
The earth's biodiversity is a precious inheritance that is threatened by an unprecedented extinction crisis. This course examines the evolutionary and ecological processes that have created this unique diversity of life, the importance of biodiversity in maintaining the earth's ecosystems, and methods used to conserve biodiversity for future generations. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: BI 349

Z 350. ANIMAL BEHAVIOR. (3 Credits)
Concepts of behavior; sensory receptors, internal mechanisms governing responses; learning and habituation; social organization and communication.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C]) and (BI 213 [C] or BI 213H [C-J]) or (BI 204 [C] and BI 205 [C] and BI 206 [C-J])
Equivalent to: BI 350

Z 361. INVERTEBRATE BIOLOGY. (3 Credits)
Exploration of the diversity and evolutionary relationships among major invertebrate phyla with an emphasis on morphological features, functional aspects, and life history for each phylum.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C]) and (BI 213 [C] or BI 213H [C-J]) or (BI 204 [C] and BI 205 [C] and BI 206 [C-J])

Z 362. INVERTEBRATE BIOLOGY LABORATORY. (2 Credits)
Morphology and anatomy of representative invertebrates introduced in Z 361; diversity within phyla. Study is by dissections and both microscopic and macroscopic examination; field trip fee. Lab fee. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C]) and (BI 213 [C] or BI 213H [C-J]) or (BI 204 [C] and BI 205 [C] and BI 206 [C-J])

Z 364. DIVERSITY OF LIFE: INVERTEBRATES. (5 Credits)
Exploration of the diversity and evolutionary relationships among major invertebrate groups with an emphasis on building and interpreting phylogenetic trees as well as comparing and contrasting morphology, function, and life history within each group. Laboratory activities build scientific skills by exploring current hypotheses and tools for the study of invertebrate evolution.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C]) and (BI 213 [C] or BI 213H [C-J]) or (BI 204 [C] and BI 205 [C] and BI 206 [C-J])
Z 365. BIOLOGY OF INSECTS. (4 Credits)
Introduction to the study of insects, focusing on the biological attributes responsible for the success and dominance of insects. Emphasis on taxonomy, morphology, behavior, ecology, and coevolutionary interrelationships. Required field trips. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 371. VERTEBRATE BIOLOGY. (3 Credits)
Overview of vertebrate origins and phylogeny integrating several disciplines (anatomy, ecology, genetics, developmental biology, physiology, behavior, and evolution) to explore the structural and functional adaptations and evolutionary history of vertebrates. Lec.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Recommended: Completion or concurrent enrollment in Z 372

Z 372. VERTEBRATE BIOLOGY LABORATORY. (2 Credits)
Classification, identification, and natural history of vertebrates. Includes laboratory examination of specimens and frequent field trips (fee charged) emphasizing Oregon fauna. Lab fee.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and Z 371 (may be taken concurrently) [D-]

Z 374. DIVERSITY OF LIFE: VERTEBRATES. (5 Credits)
Examination of vertebrate origins and phylogeny, integrating several disciplines (molecular biology, anatomy, behavioral ecology, and evolution). Emphasizes critical thinking and the scientific process to explore the structural/functional adaptations and evolutionary history of vertebrates. Laboratory activities build scientific skills by exploring current hypotheses and tools for the study of vertebrate evolution.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 422. COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY. (5 Credits)
Phylogenetically-based study of the form and function of vertebrate organ systems, including integumentary, musculoskeletal, cardiopulmonary, digestive, and sensory. Lab emphasizes comparative form through dissection, and function through non-invasive experimentation. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (CH 332 may be taken concurrently) [D-] or CH 335 (may be taken concurrently) [D-]

Z 423. ENVIRONMENTAL PHYSIOLOGY. (3 Credits)
Comparative environmental physiology of animals with emphasis on adaptations to such aspects of the physical environment as temperature, water, ions, and gases. Consideration given to interactions between physiology and environment that influence the local and geographic distribution of animals.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 123 [C-] or (CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-]))

Z 425. EMBRYOLOGY AND DEVELOPMENT. (5 Credits)
Prerequisites: (BI 311 with D- or better or BI 311H with D- or better) and (BI 314 [D-] or BI 314H [D-] or BB 314 [D-] or BB 314H [D-])

Z 431. VERTEBRATE PHYSIOLOGY I. (4 Credits)
Systems/concepts covered include motor reflexes, autonomic nervous system, digestion/metabolism, renal and osmoregulatory, endocrine and reproductive systems. First in Z 431, Z 432/442 series. Lec/rec.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (CH 332 (may be taken concurrently) [C-] or CH 335 (may be taken concurrently) [C-])

Z 432. VERTEBRATE PHYSIOLOGY II. (3 Credits)
Systems/concepts covered include blood, immune, lymphatic, cardiovascular, and pulmonary. Second in the Z431, 432/442 series.
Prerequisites: Z 431 with C- or better

Z 437. VERTEBRATE ENDOCRINOLOGY. (4 Credits)
An exploration of vertebrate endocrinology that examines principles of hormone action, inter-and intracellular signaling mechanisms within endocrine axes, and comparative endocrine physiology, emphasizing concepts of homeostasis and methodologies for evaluating normal and physiological function. Students are provided multiple forums for class participation, in the form of scientific presentations and ‘mini-reports.’
Prerequisites: BB 314 with D- or better or BB 314H with D- or better

Z 438. BEHAVIORAL NEUROBIOLOGY. (3 Credits)
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 123 [C-] or (CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-])

Z 440. INSECT PHYSIOLOGY. (3 Credits)
Fundamentals of insect physiology from the behavioral to the molecular level. Cellular physiology and hormonal control of molting, metamorphosis and reproduction. Overview of body functions: respiration, circulation, digestion, metabolism, and osmoregulation. Physiological basis of behavior: muscles and flight, structure and functions of the nervous system, sensory physiology and chemical communication. The contributions of insect physiology to general physiological principles and biorational methods of insect pest control are discussed.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 123 [C-] or ((CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-]))
Equivalent to: ENT 416

Z 442. VERTEBRATE PHYSIOLOGY LABORATORY. (2 Credits)
Experiments and exercises in vertebrate physiology covering systems studied in Z 431 and Z 432. Available to Biology majors. Lab fee.
Prerequisites: Z 431 with C- or better and Z 432 (may be taken concurrently) [C-]
Z 461. MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY. (4 Credits)
Comparative survey of eight major invertebrate phyla and many lesser-known phyla. Areas of emphasis will be 1) invertebrate identification, 2) natural history (diversity, habitat, feeding, behavior), and 3) comparative anatomy (adaptive significance of morphological structures). Laboratories and field trips will strongly supplement lecture material. Lec/ lab. Taught at Hatfield Marine Science Center.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) or (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 473. HERPETOLOGY. (4 Credits)
Exploration of global herpetofauna focusing on taxa of the Pacific Northwest of North America. Identification and natural history of amphibians and reptiles are emphasized, along with a phylogenetic framework, to explore and discuss ideas involving their behavior, evolution, ecology, and conservation. Student projects examine important topics in the field.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 477. AQUATIC ENTOMOLOGY. (4 Credits)
Biology, ecology, collection, and identification of aquatic insects. Two required Saturday field trips. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 499. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
Equivalent to: Z 499H
This course is repeatable for 16 credits.

Z 499H. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary.
Equivalent to: Z 499
This course is repeatable for 16 credits.

Biology Minor
Also available at OSU-Cascades and via Ecampus.

Administered by the Department of Integrative Biology under the School of Life Sciences.

Minor Code: 509

Students majoring in Biochemistry and Biophysics, Biochemistry and Molecular Biology, Biohealth Sciences, Biology, Botany, Microbiology and Zoology cannot declare the Biology minor. The courses below may be shared with other majors outside of those listed above.

The Biology minor includes a required introductory biology sequence with a chemistry prerequisite or corequisite for the second term of each series. A term of organic chemistry, CH 331 or CH 334, is required to take BB 314 and some of the listed physiology courses. A C– or better in the BI 21x or 20x series is required to complete the minor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BI 211 &amp; BI 212 &amp; BI 213</td>
<td>*PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY</td>
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</table>

Biology Undergraduate Major (BS, HBS)

Also available at OSU-Cascades.

Administered by the Department of Integrative Biology under the School of Life Sciences.

The undergraduate BS degree in Biology is designed for students seeking an interdisciplinary background in the life sciences. The major couples a comprehensive biological, physical and quantitative sciences core with a variety of electives that can be catered to meet diverse professional goals. Undergraduate research, internship, teaching and study abroad experience are strongly recommended, and credits can be integrated
with major requirements. Biology majors receive excellent training for graduate and professional programs.

Corvallis Campus students may choose to complete one transcript-visible option in Ecology (p. 1008), Genetics (p. 1009), Marine Biology (p. 1010), Physiology and Behavior (p. 1011), Pre-Dentistry/Biology (p. 1011), Pre-Education Biology (p. 1012), Pre-Medicine/Biology (p. 1013), or Pre-Veterinary Medicine (p. 1014). Options in the Biology major require fifteen or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional option course work in four years.

**Major Code: 509**

Students in the Biology major must complete BI 211 or BI 211H, BI 212 or BI 212H, and BI 213 or BI 213H with a C– or better to continue on to upper-division Biology (Bi) and Zoology (Z) coursework. Students must also complete CH 231/CH 261, CH 232/CH 262 or CH 233/CH 263 and CH 331 and CH 332 with a C– or better to continue on to upper-division Chemistry (CH) coursework.

Students majoring in Biology cannot seek a dual or double major in Biochemistry and Biophysics, Biochemistry and Molecular Biology, Biohealth Sciences, Microbiology or Zoology.

Declaring an option can modify the statistics and elective areas of the major. For further information, see MyDegrees or the Integrative Biology (http://ib.oregonstate.edu) website.

### Biology Core Courses

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<tr>
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<th>Title</th>
<th>Hours</th>
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<tr>
<td>BI 197</td>
<td>PROFESSIONAL DEVELOPMENT I: HEALTH PROFESSIONS</td>
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</tr>
<tr>
<td>or BI 198</td>
<td>PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>BI 298</td>
<td>PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II</td>
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### Baccalaureate Core Communications

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<tr>
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</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
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### Baccalaureate Core Writing II

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<tr>
<td>WR 237</td>
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<tr>
<td>or WR 362</td>
<td>*SCIENCE WRITING</td>
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### Mathematics and Statistics Core

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<td>MTH 251</td>
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<td>&amp; MTH 252</td>
<td>and INTEGRAL CALCULUS</td>
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<tr>
<td>or MTH 227 &amp; MTH 228</td>
<td>*CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I</td>
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<tr>
<td>&amp; MTH 229</td>
<td>and PROBABILITY FOR THE LIFE SCIENCES II</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<tr>
<td>or ST 411 &amp; ST 412</td>
<td>METHODS OF DATA ANALYSIS</td>
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<td>&amp; METHODS OF DATA ANALYSIS</td>
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### Chemistry Core

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<td>CH 231</td>
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<td>&amp; CH 261</td>
<td>and LABORATORY FOR CHEMISTRY 231</td>
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<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
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<td>&amp; CH 262</td>
<td>and LABORATORY FOR CHEMISTRY 232</td>
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<td>CH 233</td>
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<td>CH 331</td>
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<td>&amp; CH 332</td>
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<td>&amp; CH 337</td>
<td>and ORGANIC CHEMISTRY LABORATORY</td>
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<tr>
<td>&amp; BB 451</td>
<td>and GENERAL BIOCHEMISTRY</td>
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### Biological Sciences Core

These courses are arranged in the order they are generally taken:

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BI 211</td>
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<td>&amp; BI 212</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>&amp; BI 213</td>
<td>and *PRINCIPLES OF BIOLOGY</td>
<td>(or the honors version of this series)</td>
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<td>BI 370</td>
<td>ECOLOGY</td>
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<td>BI 311</td>
<td>GENETICS</td>
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<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BI 445</td>
<td>EVOLUTION</td>
<td>3</td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
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<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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### Senior Biology Major Field Test

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BI 498</td>
<td>SENIOR BIOLOGY FIELD TEST</td>
<td>2</td>
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</table>

### Electives

**3 Electives**

**Biology and Society**

Select one BCC course from the following or see option: 3-4

- AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
- AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY
- BB 331 *INTRODUCTION TO MOLECULAR BIOLOGY
- BB 332 *MOLECULAR MEDICINE
- BI 175 *GENOMES, IDENTITIES AND SOCIETIES
- BI 301 *HUMAN IMPACTS ON ECOSYSTEMS
- BI 345 *INTRODUCTION TO EVOLUTION
- BI 347 *OCEANS IN PERIL
- BI 348 *HUMAN ECOLOGY
- BI 420 *VIRUSES IN MODERN SOCIETY
- BOT 324 *FUNGI IN SOCIETY
- FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
- FW 350 *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY
- H 312 *HIV/AIDS AND STIS IN MODERN SOCIETY
- HSTS 416 *HISTORY OF MEDICINE PRE-1800
- MB 330 *DISEASE AND SOCIETY
- PHL 443/REL 443 *WORLD VIEWS AND ENVIRONMENTAL VALUES
- Z 349 *BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION

### Physics or Computer Science and Quantitative Applications

Select one of the following tracks or see option: 14-16

#### Track I Physics

- PH 201 *GENERAL PHYSICS
- & PH 202 and *GENERAL PHYSICS
- & PH 203 and *GENERAL PHYSICS (required for most human health professions)

#### Track II Computer Science and Quantitative Applications

- CS 161 INTRODUCTION TO COMPUTER SCIENCE I
- & CS 162 and INTRODUCTION TO COMPUTER SCIENCE II

Select two additional courses from the following:

- BB 485 APPLIED BIOINFORMATICS
- BI 456 PHYLOGENETICS
- BI 481 BIOGEOGRAPHY
- BI 483 POPULATION BIOLOGY
- BOT 458 ECOSYSTEMS GENOMICS
- BOT 460 FUNCTIONAL GENOMICS
- BOT 475 COMPARATIVE GENOMICS
- BOT 476 INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES
- GEOG 360 GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY
- GEOG 361 GISCIENCE II: ANALYSIS AND APPLICATIONS
- OC 449 ECOLOGICAL THEORIES IN BIOLOGICAL AND FISHERIES OCEANOGRAPHY DATA
- ST 431 SAMPLING METHODS
- ST 435 QUANTITATIVE ECOLOGY

Other courses by approval

### Organismal Biology

Select one course from the following or see option: 3-5

- BI 298 PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY
- BB 331 *INTRODUCTION TO MOLECULAR BIOLOGY
- BB 332 *MOLECULAR MEDICINE
- BI 175 *GENOMES, IDENTITIES AND SOCIETIES
- BI 301 *HUMAN IMPACTS ON ECOSYSTEMS
- BI 345 *INTRODUCTION TO EVOLUTION
- BI 347 *OCEANS IN PERIL
- BI 348 *HUMAN ECOLOGY
- BI 420 *VIRUSES IN MODERN SOCIETY
- BOT 324 *FUNGI IN SOCIETY
- FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
- FW 350 *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY
- H 312 *HIV/AIDS AND STIS IN MODERN SOCIETY
- HSTS 416 *HISTORY OF MEDICINE PRE-1800
- MB 330 *DISEASE AND SOCIETY
- PHL 443/REL 443 *WORLD VIEWS AND ENVIRONMENTAL VALUES
- Z 349 *BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>BI 231</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>&amp; BI 341</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
</tr>
<tr>
<td>&amp; BI 332</td>
<td>LABORATORY</td>
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<tr>
<td>&amp; BI 342</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
</tr>
<tr>
<td>&amp; BI 332</td>
<td>LABORATORY</td>
</tr>
<tr>
<td>BOT 331</td>
<td>PLANT PHYSIOLOGY</td>
</tr>
<tr>
<td>BOT 488</td>
<td>ENVIRONMENTAL PHYSIOLOGY OF PLANTS</td>
</tr>
<tr>
<td>Z 423</td>
<td>ENVIRONMENTAL PHYSIOLOGY</td>
</tr>
<tr>
<td>Z 425</td>
<td>EMBRYOLOGY AND DEVELOPMENT</td>
</tr>
<tr>
<td>Z 431</td>
<td>VERTEBRATE PHYSIOLOGY I</td>
</tr>
<tr>
<td>Z 440</td>
<td>INSECT PHYSIOLOGY</td>
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</table>

**Writing Intensive Course (WIC)**

Select one course from the following or see option: 3-4

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 319</td>
<td>*CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES</td>
</tr>
<tr>
<td>BI 371</td>
<td>*ECOLOGICAL METHODS</td>
</tr>
<tr>
<td>BI 373</td>
<td>*FIELD METHODS IN MARINE ECOLOGY</td>
</tr>
<tr>
<td>BOT 323</td>
<td>*FLOWERING PLANTS OF THE WORLD</td>
</tr>
<tr>
<td>MB 385</td>
<td>*EMERGING INFECTIOUS DISEASES AND EPIDEMICS</td>
</tr>
</tbody>
</table>

**Experiential Learning or Integrative Biology Elective**

Select one of the following two tracks or an option: 3-4

**Track I Experiential Learning Credits**

Select any combination of three credits from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 309</td>
<td>TEACHING PRACTICUM (by approval)</td>
</tr>
<tr>
<td>BI 401</td>
<td>RESEARCH AND SCHOLARSHIP (by approval)</td>
</tr>
<tr>
<td>BI 406</td>
<td>PROJECTS: CURATORIAL ASSISTANT (by approval)</td>
</tr>
<tr>
<td>BI 409</td>
<td>ADVANCED TEACHING PRACTICUM (by approval)</td>
</tr>
<tr>
<td>BI 410</td>
<td>INTERNSHIP (by approval)</td>
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</tbody>
</table>

OSU international internships (INTL credits) by approval

**Track II Integrative Biology Course**

Select one from the following:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BI 333</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>&amp; BI 343</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
</tr>
<tr>
<td>&amp; BI 343</td>
<td>LABORATORY</td>
</tr>
<tr>
<td>BI 353</td>
<td>PACIFIC NORTHWEST COASTAL ECOSYSTEMS (taught at Hatfield Marine Science Center)</td>
</tr>
<tr>
<td>BI 358</td>
<td>SYMBIOSIS AND THE ENVIRONMENT</td>
</tr>
<tr>
<td>BI 375</td>
<td>FIELD METHODS IN ECOLOGICAL RESTORATION (taught at OSU Cascades)</td>
</tr>
<tr>
<td>BI 427</td>
<td>PALEOBIOLOGY (if not used above)</td>
</tr>
<tr>
<td>BI 450</td>
<td>*MARINE BIOLOGY AND ECOLOGY (taught at Hatfield Marine Science Center)</td>
</tr>
<tr>
<td>BI 456</td>
<td>PHYLOGENETICS (if not used above)</td>
</tr>
<tr>
<td>BI 481</td>
<td>BIOGEOGRAPHY</td>
</tr>
<tr>
<td>BI 483</td>
<td>POPULATION BIOLOGY (if not used above)</td>
</tr>
<tr>
<td>BI 485</td>
<td>MONSTER BIOLOGY</td>
</tr>
<tr>
<td>BI 495</td>
<td>DISEASE ECOLOGY</td>
</tr>
<tr>
<td>Z 350</td>
<td>ANIMAL BEHAVIOR</td>
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**Total credits required for graduation**: 180

*Baccalaureate Core Course (BCC)*

* Alternative series is ST 351, ST 411 and ST 412

1. biology majors are required to take BI 498, a comprehensive, two-hour biology major field test (http://ib.oregonstate.edu/advising/MFT-info/), in their final OSU term (or spring term if they will graduate in summer) in order to graduate

2. Declaring an option will alter the elective categories below, and all options automatically clear the upper-division science electives requirement. See the individual options or MyDegrees for details. Biology and society electives also count as BCC

3. BI 450 (taught at Hatfield Marine Science Center) is by application only and may count for other major requirements

**Sample Four-Year Plans: Biology**

Student must add electives to reach 180 credits by graduation.

**Biology - TRACK I**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Hours</th>
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<tr>
<td>BI 197</td>
<td>PROFESSIONAL DEVELOPMENT I: HEALTH</td>
<td>1</td>
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<td>or BI 198</td>
<td>PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY</td>
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</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 261</td>
<td>*LABORATORY FOR CHEMISTRY 231</td>
<td></td>
</tr>
<tr>
<td>MTH 111</td>
<td>*COLLEGE ALGEBRA</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 112</td>
<td>or *ELEMENTARY FUNCTIONS</td>
<td></td>
</tr>
<tr>
<td>Bacc Core</td>
<td></td>
<td>3</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH (or PAC Course)</td>
<td>2</td>
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**Winter**

<table>
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<tr>
<td>CH 232</td>
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<tr>
<td>&amp; CH 262</td>
<td>*LABORATORY FOR CHEMISTRY 232</td>
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<td>MTH 112</td>
<td>*ELEMENTARY FUNCTIONS</td>
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**Spring**

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<th>Hours</th>
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<tbody>
<tr>
<td>BI 298</td>
<td>PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II</td>
<td>1</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
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<tr>
<td>&amp; CH 263</td>
<td>*LABORATORY FOR CHEMISTRY 233</td>
<td></td>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
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<tr>
<td>or MTH 227</td>
<td>or *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES</td>
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<tr>
<td>Course</td>
<td>Title</td>
<td>Hours</td>
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<tr>
<td>-------------------------------</td>
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<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
<td>4</td>
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<tr>
<td>MTH 252 or MTH 228</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
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<tr>
<td></td>
<td>or CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II</td>
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<tr>
<td>Bacc Core</td>
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<td>3</td>
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<td></td>
<td><strong>Hours</strong></td>
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<tr>
<td>Winter</td>
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<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<tr>
<td>Bacc Core</td>
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<tr>
<td>Spring</td>
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<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
<td>4</td>
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<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<td>Bacc Core</td>
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<tr>
<td>Third Year</td>
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<tr>
<td>Fall</td>
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<td>BB 450</td>
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<td>GENETICS</td>
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<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td></td>
</tr>
<tr>
<td>BI 370</td>
<td>ECOLOGY</td>
<td></td>
</tr>
<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
<td>5</td>
</tr>
<tr>
<td>Bacc Core</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td>15-16</td>
</tr>
<tr>
<td>Winter</td>
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<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
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<td>Select one of the following:</td>
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<tr>
<td>BI 311</td>
<td>GENETICS</td>
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<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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<td>BI 370</td>
<td>ECOLOGY</td>
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<td>PH 202</td>
<td>*GENERAL PHYSICS</td>
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<tr>
<td>Bacc Core</td>
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<td>3</td>
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<td></td>
<td><strong>Hours</strong></td>
<td>14-15</td>
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<tr>
<td>Spring</td>
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<td>Select one of the following:</td>
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<td>3-4</td>
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<tr>
<td>BI 311</td>
<td>GENETICS</td>
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<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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<td>ECOLOGY</td>
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<td>BI 445</td>
<td>EVOLUTION</td>
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<td>PH 203</td>
<td>*GENERAL PHYSICS</td>
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<td>Select one of the following:</td>
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<td>Biology and Society</td>
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<tr>
<td>Organismal Biology</td>
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<td>Physiology</td>
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<td>Writing Intensive Course</td>
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<td><strong>Hours</strong></td>
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<tr>
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<tr>
<td>BI 311</td>
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<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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<td>BI 370</td>
<td>ECOLOGY</td>
<td></td>
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<tr>
<td>Second Year</td>
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<tr>
<td>Fall</td>
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<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
<td>4</td>
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<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
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<tr>
<td>MTH 252 or MTH 228</td>
<td>INTEGRAL CALCULUS</td>
<td>4</td>
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<tr>
<td></td>
<td>or CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II</td>
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<td></td>
<td><strong>Hours</strong></td>
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<tr>
<td>Spring</td>
<td></td>
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</tr>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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</tr>
<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<tr>
<td></td>
<td><strong>Hours</strong></td>
<td>15</td>
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</tbody>
</table>
### Winter

Select one of the following:

- BI 311 GENETICS
- BB 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- CH 332 ORGANIC CHEMISTRY
- PH 202 *GENERAL PHYSICS

Bacc Core 3

Hours 15-16

### Spring

Select one of the following:

- BI 311 GENETICS
- BB 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- CH 337 ORGANIC CHEMISTRY LABORATORY
- PH 203 *GENERAL PHYSICS

Bacc Core 3

Hours 15-16

### Third Year

#### Fall

- BB 450 GENERAL BIOCHEMISTRY

Select one of the following:

- BI 311 GENETICS
- BB 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- BI 445 EVOLUTION
- ST 351 INTRODUCTION TO STATISTICAL METHODS

Bacc Core 3

Hours 1-14

### Winter

Select one of the following:

- BB 451 GENERAL BIOCHEMISTRY

Select one of the following:

- BI 311 GENETICS
- BB 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- BI 445 EVOLUTION
- ST 352 INTRODUCTION TO STATISTICAL METHODS

Bacc Core 3

Hours 1-14

### Spring

Select one of the following:

- BI 311 GENETICS
- BB 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- BI 445 EVOLUTION

Select one of the following:

- Biology and Society
- Organismal Biology
- Physiology
- Writing Intensive Course

MB 302 GENERAL MICROBIOLOGY

MB 303 GENERAL MICROBIOLOGY LABORATORY

Bacc Core 3

Hours 14-15

### Fourth Year

#### Fall

Select one of the following:

- Biology and Society
- Organismal Biology
- Physiology
- Writing Intensive Course

### Biology - TRACK III

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
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<tr>
<td>Fall</td>
<td></td>
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</tr>
<tr>
<td>BI 197</td>
<td>PROFESSIONAL DEVELOPMENT I: HEALTH</td>
<td>1</td>
</tr>
<tr>
<td>or BI 198</td>
<td>PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY</td>
<td></td>
</tr>
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<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; CH 261</td>
<td>and *LABORATORY FOR CHEMISTRY 231</td>
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<td>Bacc Core</td>
<td>3</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH (or PAC Course)</td>
<td>1-2</td>
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<tr>
<td>Hours</td>
<td>14-15</td>
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<td>Winter</td>
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<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>CH 232</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
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<tr>
<td>&amp; CH 262</td>
<td>and *LABORATORY FOR CHEMISTRY 232</td>
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<tr>
<td>Two Bacc Core courses</td>
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<td>Hours</td>
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<td>Spring</td>
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<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
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<tr>
<td>BI 298</td>
<td>PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY</td>
<td>5</td>
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<tr>
<td>&amp; CH 263</td>
<td>and *LABORATORY FOR CHEMISTRY 233</td>
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</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
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<tr>
<td>or MTH 227</td>
<td>or *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I</td>
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<tr>
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<td>3</td>
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<tr>
<td>Hours</td>
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<td>Fall</td>
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<td>GENETICS</td>
<td>3</td>
</tr>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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<td>BI 370</td>
<td>ECOLOGY</td>
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<td>BI 445</td>
<td>EVOLUTION</td>
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<td>ORGANIC CHEMISTRY</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<tr>
<td>or MTH 228</td>
<td>or *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II</td>
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<tr>
<td>Hours</td>
<td>14-15</td>
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</tbody>
</table>
### Ecology Option

**This option is offered within the following major(s):**
- Biology - College of Science (p. 1003)

The Biology major Ecology option is designed to provide students with a strong background in the theory and applications of ecology and environmental studies. It couples the core biological sciences background from the Biology major with required ecology, conservation, field methods, and environmental policy course work. A variety or upper-division ecology and organismal biology electives can be chosen based on individual interests. Undergraduate research and internship experience are strongly recommended for option students, and three credits can be applied to the Electives. The Ecology option provides excellent preparation for graduate programs in ecology.

**Option Code: 715**

Options in the Biology major require 15 or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional Ecology option course work in four years. Courses used to satisfy the Ecology option requirements also satisfy the Biology and Society, Organismal Biology, Physiology, Writing Intensive Course and Experiential Learning or Integrative Biology Elective requirements for the Biology major.

It is recommended that Ecology option students take ST 411 and ST 412 in place of ST 352 for the major statistics requirement.

Several Ecology option courses may also be used to satisfy areas of the baccalaureate core.

For further information, see MyDegrees or the Integrative Biology website (http://ib.oregonstate.edu).

---

### Plant Organismal Biology

Select one course from the following:
- BOT 321 PLANT SYSTEMATICS
- BOT 416 AQUATIC BOTANY
- RNG 353 WILDLAND PLANT IDENTIFICATION

### Animal Organismal Biology

Select one course from the following:
- Z 361 INVERTEBRATE BIOLOGY
- Z 371 VERTEBRATE BIOLOGY
- Z 477 AQUATIC ENTOMOLOGY

### Ecological Methods/Writing Intensive Course (WIC)

Select one course from the following:
- BI 371 *ECOLOGICAL METHODS
- BI 373 *FIELD METHODS IN MARINE ECOLOGY

---

### Winter

Select one of the following:
- BI 311 GENETICS
- BI 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- BI 445 EVOLUTION
- CH 332 ORGANIC CHEMISTRY
- ST 351 INTRODUCTION TO STATISTICAL METHODS

Bacc Core: 3

**Hours: 14-15**

### Spring

Select one of the following:
- BI 311 GENETICS
- BI 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- BI 445 EVOLUTION
- CH 337 ORGANIC CHEMISTRY LABORATORY
- ST 352 INTRODUCTION TO STATISTICAL METHODS

Bacc Core: 3

**Hours: 14-15**

### Third Year

#### Fall

- BB 450 GENERAL BIOCHEMISTRY

Select one of the following:
- BI 311 GENETICS
- BI 314 CELL AND MOLECULAR BIOLOGY
- BI 370 ECOLOGY
- BI 445 EVOLUTION
- PH 201 *GENERAL PHYSICS

Bacc Core: 3

**Hours: 15-16**

#### Winter

- BB 451 GENERAL BIOCHEMISTRY
- PH 202 *GENERAL PHYSICS

Select one of the following:
- Biology and Society
- Organismal Biology
- Physiology
- Writing Intensive Course

Bacc Core: 3

**Hours: 14**

### Spring

- MB 302 GENERAL MICROBIOLOGY
- MB 303 GENERAL MICROBIOLOGY LABORATORY
- PH 203 *GENERAL PHYSICS

Select one of the following:
- Biology and Society
- Organismal Biology
- Physiology
- Writing Intensive Course

**Hours: 13**

### Fourth Year

#### Fall

Select one of the following:
- Biology and Society
- Organismal Biology
- Physiology
- Writing Intensive Course

**Hours: 3**

#### Winter

Select one of the following:
- Biology and Society
- Organismal Biology
- Physiology
- Writing Intensive Course

**Hours: 3**

**Total Hours: 139-144**
Z 350 ANIMAL BEHAVIOR 3
Z 423 ENVIRONMENTAL PHYSIOLOGY 3
or BOT 488 ENVIRONMENTAL PHYSIOLOGY OF PLANTS

Population Ecology
Select one course from the following: 3-4
BI 483 POPULATION BIOLOGY
BOT 442 PLANT POPULATION BIOLOGY
FW 320 INTRODUCTORY POPULATION DYNAMICS

Community and Ecosystem Ecology
Select one course from the following: 3-5
BI 306 ENVIRONMENTAL ECOLOGY
BI 351 MARINE ECOLOGY
BI 353 PACIFIC NORTHWEST COASTAL ECOSYSTEMS
BI 481 BIOGEOGRAPHY
FES 341 FOREST ECOLOGY
FW 321 APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY
FW 456 FRESHWATER ECOLOGY AND CONSERVATION
FW 479 WETLANDS AND RIPARIAN ECOLOGY
GEO 484 INTRODUCTION TO BIOGEOCHEMISTRY
OC 434/FW 434 ESTUARINE ECOLOGY

Conservation and Human Impacts
Select one course from the following: 3
BI 301 HUMAN IMPACTS ON ECOSYSTEMS
BI 348 HUMAN ECOLOGY
Z 349 BIODIVERSITY CAUSES, CONSEQUENCES, AND CONSERVATION

Environmental Policy
Select one course from the following: 3-4
AEC 250 *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY
AEC 253 *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS
AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY
FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
FES 485 *CONSSENSUS AND NATURAL RESOURCES
FW 350 *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY

Experiential Learning or Ecology Elective Courses
Select both tracks or two courses from Track ii: 6-8

Track i Experiential Learning Credits
Select any combination of three credits from the following:
BI 401 RESEARCH AND SCHOLARSHIP (by approval)
BI 406 PROJECTS: CURATORIAL ASSISTANT (by approval)
BI 410 INTERNSHIP (by approval or international internships approved by the Integrative Biology Lead Advisor)

Track ii Ecology Elective
BI 353 PACIFIC NORTHWEST COASTAL ECOSYSTEMS (if not taken above)
BI 358 SYMBIOSIS AND THE ENVIRONMENT
BI 375 FIELD METHODS IN ECOLOGICAL RESTORATION (taught at OSU Cascades)
BI 427 PALEOBIOLOGY
BI 481 BIOGEOGRAPHY (if not taken above)
BI 485 MONSTER BIOLOGY
BI 495 DISEASE ECOLOGY
BOT 341 PLANT ECOLOGY
BOT 458 ECOSYSTEMS GENOMICS
CH 390 ENVIRONMENTAL CHEMISTRY
FES 440 WILDLAND FIRE ECOLOGY
FES 452/FW 452 BIODIVERSITY CONSERVATION IN MANAGED FORESTS
or FW 458 MAMMAL CONSERVATION AND MANAGEMENT
or HORT 318 *APPLIED ECOLOGY OF MANAGED ECOSYSTEMS
FES 445/FW 445 ECOCOCOSYSTEMS GENOMICS

Total Hours 35-42
* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 715

Genetics Option

This option is offered within the following major(s):

- Biology - College of Science (p. 1003)

The Biology major Genetics option is designed to provide a solid background in genetic theory and methods, as well as their application to evolutionary questions. Option students couple the core biological sciences background from the Biology major with genetics laboratory-intensive course work in addition to genetics and bioinformatics electives. Undergraduate research or internship experience is strongly recommended for option students, and three credits can be applied to the Upper-division Science Elective requirements. The Genetics option is an excellent way to prepare for graduate programs in genetics and evolutionary biology.

Option Code: 517

Options in the Biology major require 15 or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional course work in the Genetics option in four years.

Courses used to satisfy the Genetics option requirements also satisfy the Physics/Computer Science and Quantitative Applications, Physiology, Writing Intensive and Experiential Learning or Integrative Biology Elective requirements for the Biology major. The statistics courses in the Genetics option also complete half of the Biology major statistics requirement.

For further information, see MyDegrees or the Integrative Biology website (http://ib.oregonstate.edu).

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<th>Hours</th>
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<tr>
<td>BB 315/BI 315</td>
<td>MOLECULAR BIOLOGY LABORATORY (Biology students can only take BI 315)</td>
<td>3</td>
</tr>
<tr>
<td>or BB 493</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1</td>
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</tr>
<tr>
<td>BB 345</td>
<td>INTRODUCTION TO BIOLOGICAL SEQUENCE ANALYSIS</td>
<td>2</td>
</tr>
<tr>
<td>BB 494</td>
<td>BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2</td>
<td>3</td>
</tr>
<tr>
<td>BI 319</td>
<td>*CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES</td>
<td>3</td>
</tr>
<tr>
<td>BI 483</td>
<td>POPULATION BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>ST 411</td>
<td>METHODS OF DATA ANALYSIS &amp; ST 412 and METHODS OF DATA ANALYSIS 1</td>
<td>8</td>
</tr>
<tr>
<td>Z 425</td>
<td>EMBRYOLOGY AND DEVELOPMENT</td>
<td>5</td>
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</tbody>
</table>

Genetics Elective
Select one course from the following: 3-4

- BB 486 ADVANCED MOLECULAR GENETICS
- BI 456 PHYLOGENETICS
- BOT 458 ECOSYSTEMS GENOMICS
- BOT 460 FUNCTIONAL GENOMICS
- BOT 475 COMPARATIVE GENOMICS
Option Code: 517

Marine Biology Option

This option is offered within the following major(s):

- Biology - College of Science (p. 1003)

The Marine Biology option is designed to give students a strong background in the biology of marine organisms and their habitats. The core biological sciences background of the Biology major is coupled with field and laboratory course work in marine biology, ecology, conservation, and oceanography. The option emphasizes research and includes experiential courses completed in residence at the OSU Hatfield Marine Science Center in Newport, Oregon. Additional research or internship experience is strongly recommended for option students, and three credits can be applied to the option electives. The Marine Biology option provides excellent preparation for graduate programs in marine biology. Students completing the Marine Biology option cannot seek the Marine Biology and Ecology minor.

Option Code: 572

Options in the Biology major require 15 or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional Marine Biology option course work in four years. Courses used to satisfy the Marine Biology option also satisfy the Biology and Society, Organismal Biology, Physiology, Writing Intensive Course, Physics/Computer Science and Quantitive Applications, and Experiential Learning or Integrative Biology electives in the Biology major.

At least one term in residence at Hatfield Marine Science Center is required (spring or summer). The 15-credit BI 450 Marine Biology and Ecology course is taught each spring term at Hatfield Marine Science Center and is by application only. The course covers marine invertebrates, algae and fishes, as well as sections on marine ecology, conservation, and policy. It also includes an undergraduate research project. Students apply to, and are accepted, the fall term before the spring they plan to attend. Applications are available in the Integrative Biology Office, Cordley Hall 3029. The summer term (https://hmsc.oregonstate.edu/academics/...courses-hmsc/summer-term/) at Hatfield does not require an application and includes a variety of courses.

BI 111 is an optional weekend experiential course at Hatfield Marine Science Center that complements other option coursework, particularly for students with little or no previous marine experience.

For further information, see MyDegrees or the Integrative Biology website (http://ib.oregonstate.edu).
If you did not complete BI 150, select a Marine Elective Course to replace it

FW 302, FW 331, FW 421 and FW 469 are all taught at Hatfield Marine Science Center
FW 315 may only be selected if not used for the summer track requirement

**Option Code: 572**

**Physiology and Behavior Option**

This option is offered within the following major(s):

- Biology - College of Science (p. 1003)

The Biology major Physiology and Behavior option is designed to provide a rigorous foundation in the comparative physiology and behavior of animals. Core biological sciences from the Biology major are coupled with course work in behavior, physiology and organismal biology. Undergraduate research or internship experience is strongly recommended for option students, and three credits can be applied to the electives for the option. The Physiology and Behavior option provides excellent preparation for graduate programs in animal behavior, physiology and other areas of organismal biology.

**Option Code: 743**

Options in the Biology major require 15 or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional course work in the Physiology and Behavior option in four years. Courses used to satisfy the Physiology and Behavior option requirements also satisfy the Organismal Biology, Physiology, Writing Intensive Course and Experiential Learning or Integrative Biology Elective requirements for the Biology major.

Students may not pursue either the Physiology and Behavior, Pre-Dental, Pre-Medical or Pre-Veterinary Medicine options with the Biology major—no dual combinations are permitted.

It is recommended that Physiology and Behavior option students take PH 201-PH 203. Students should also consider taking PSY 202 which is optional but required for some of the Psychology elective courses.

For further information, see MyDegrees or the Integrative Biology website (http://ib.oregonstate.edu).

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PSY 201</td>
<td>*GENERAL PSYCHOLOGY</td>
<td>3</td>
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<td>BI 319</td>
<td>*CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES</td>
<td>3</td>
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<tr>
<td>Z 350</td>
<td>ANIMAL BEHAVIOR</td>
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<tr>
<td>Z 425</td>
<td>EMBRYOLOGY AND DEVELOPMENT</td>
<td>5</td>
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<tr>
<td>Z 431</td>
<td>VERTEBRATE PHYSIOLOGY I</td>
<td>4</td>
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<tr>
<td>Z 452</td>
<td>VERTEBRATE PHYSIOLOGY II</td>
<td>5</td>
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<tr>
<td>&amp; Z 442</td>
<td>VERTEBRATE PHYSIOLOGY LABORATORY</td>
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<tr>
<td>Z 438</td>
<td>BEHAVIORAL NEUROBIOLOGY</td>
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<tr>
<td>Z 361</td>
<td>INVERTEBRATE BIOLOGY</td>
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<td>Z 362</td>
<td>and INVERTEBRATE BIOLOGY LABORATORY</td>
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<tr>
<td>Z 371</td>
<td>VERTEBRATE BIOLOGY</td>
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<tr>
<td>&amp; Z 372</td>
<td>and VERTEBRATE BIOLOGY LABORATORY</td>
<td></td>
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<tr>
<td>Z 461</td>
<td>MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY</td>
<td>(Taught at Hatfield Marine Science Center)</td>
</tr>
</tbody>
</table>

**Experiential Learning of Physiology and Behavior Elective Courses**

Select one of the following tracks: 3-4

**Track I Experiential Learning**

Select any combination of three credits from the following:

- BI 401 RESEARCH AND SCHOLARSHIP (by approval)
- BI 410 INTERNSHIP (by approval or international internships approved by the Integrative Biology Lead Advisor)

**Track II Physiology and Behavior Elective Course**

Select one course from the following:

- ANS 441 TOPICS IN ANIMAL LEARNING
- BB 360 INTRODUCTION TO NEUROSCIENCE
- BI 358 SYMBIOSIS AND THE ENVIRONMENT
- BI 485 MONSTER BIOLOGY
- PSY 330 BRAIN AND BEHAVIOR
  or ANS 341 ANIMAL BEHAVIOR AND COGNITION
- Z 422 COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY
- Z 423 ENVIRONMENTAL PHYSIOLOGY
- Z 437 VERTEBRATE ENDOCRINOLOGY

Total Hours: 33-35

^ Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

**Option Code: 743**

**Pre-Dentistry/Biology Option**

This option is offered within the following major(s):

- Biology - College of Science (p. 1003)

The Pre-Dentistry/Biology option is designed to meet the requirements for most dental schools in the U.S., but students should consult the requirements for specific schools before they apply because requirements can change. The option couples the comprehensive biological sciences background of the Biology major with human physiology laboratory experiences and important social science requirements. Dedicated health profession advisors work with Pre-Dentistry/Biology option students to integrate essential professional experiences during their time at OSU.

**Option Code: 713**

Options in the Biology major require 15 or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional Pre-Dentistry/Biology option course work in four years. Students may not complete any combination of the Pre-Medical, Pre-Dental option or Physiology and Behavior options. Completion of the Pre-Dental option requires a 3.0 cumulative GPA in major and option course work. Courses used to satisfy the Pre-Dentistry/Biology option requirements also satisfy the Physics/Computer Science and Quantitative Applications; Physiology, Writing Intensive Course and Experiential Learning or Integrative Biology Elective requirements in the Biology major. Several courses may also be used to satisfy areas of the Baccalaureate Core.

Students may not pursue either the Pre-Dentistry, Pre-Veterinary Medicine, Pre-Medicine or Physiology and Behavior options within the Biology major —no combinations of these options are permitted.

Students interested in private practice should also consider taking BA 215 or BA 260.
Pre-Education Biology Option

This option is offered within the following major(s):

- Biology - College of Science (p. 1003)

The Pre-Education Biology option is designed to complete the requirements for the Science Education option in the OSU Education master’s degree and other U.S. graduate licensure programs for secondary education. Students should consult the requirements for specific schools before they apply because requirements can change and vary some between institutions. The option couples the strong background of the Biology major with core science education and science electives, as well as a required practicum experience. Students receive specific education advising to integrate teaching and other essential professional experiences during their time at OSU.
Students interested in private practice should also consider taking BA 215 or BA 260.

For further information, see MyDegrees or the Integrative Biology website (http://ib.oregonstate.edu).

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<th>Code</th>
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<tr>
<td>BI 109</td>
<td>HEALTH PROFESSIONS: MEDICAL</td>
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<tr>
<td>PHAR 210</td>
<td>TERMINALOGY OF THE HEALTH SCIENCES</td>
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<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
<td>4</td>
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<tr>
<td>or PHL 444/REL 444</td>
<td>*BIOMEDICAL ETHICS</td>
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<td>PSY 201</td>
<td>*GENERAL PSYCHOLOGY</td>
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<td>&amp; PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
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<tr>
<td>SDC 204</td>
<td>*INTRODUCTION TO SOCIOLOGY (required for pre-medical students)</td>
<td>3-4</td>
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<tr>
<td>or ECON 201</td>
<td>*INTRODUCTION TO MICROECONOMICS</td>
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<tr>
<td>PH 201</td>
<td>*GENERAL PHYSICS</td>
<td>15</td>
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<tr>
<td>&amp; PH 202</td>
<td>*GENERAL PHYSICS</td>
<td></td>
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<tr>
<td>&amp; PH 203</td>
<td>*GENERAL PHYSICS</td>
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</table>

**Writing Intensive Course (WIC)**

Select one course from the following: 3-4

- BI 319 *CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES
- MB 385 *EMERGING INFECTIOUS DISEASES AND EPIDEMICS
- HSTS 417 **HISTORY OF MEDICINE

**Physiology**

Select one of the following tracks: 14-15

**Comparative Vertebrate Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>Z 422</td>
<td>COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY EMBRYOLOGY AND DEVELOPMENT</td>
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<tr>
<td>Z 431</td>
<td>VERTEBRATE PHYSIOLOGY I</td>
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<td>Z 432</td>
<td>VERTEBRATE PHYSIOLOGY II</td>
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<tr>
<td>&amp; Z 442</td>
<td>VERTEBRATE PHYSIOLOGY LABORATORY</td>
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**Human Track**

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<tr>
<td>BI 331</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>&amp; BI 332</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>&amp; BI 333</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<td>BI 341</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<tr>
<td>&amp; BI 342</td>
<td>LABORATORY</td>
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<td>&amp; BI 343</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
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<tr>
<td>&amp; BI 343</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
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</table>

**Experiential Learning or Biological Science/Psychology Elective Courses**

Select one of the following tracks: 3

**Track I Experiential Learning Credits**

Select any combination of three credits from the following or GS 410 Medical Preceptorship credits by approval: 3

- BI 309 TEACHING PRACTICUM (by approval)
- BI 401 RESEARCH AND SCHOLARSHIP (by approval)
Pre-Veterinary Medicine Option

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Option Code: 714**

**Pre-Veterinary Medicine Option**

This option is offered within the following major(s):

* Biology - College of Science (p. 1003)

The Biology major Pre-Veterinary Medicine option is designed to meet OSU College of Veterinary Medicine prerequisites and other U.S. veterinary schools, but students should consult the requirements for specific schools before they apply because requirements can change. The Pre-Veterinary Medicine option couples the strong biological sciences background of the Biology major with core animal anatomy and physiology laboratories and animal-focused science electives. Dedicated professional advisors work with Pre-Veterinary Medicine option students to integrate animal handling and other essential professional experiences during their time at OSU.

**Option Code: 584**

Options in the Biology major require 15 or fewer additional credits (one term) beyond the basic Biology major, and most students can complete the additional Pre-Veterinary Medicine option course work in four years. Completion of the Pre-Veterinary Medicine option requires a 3.0 cumulative GPA in major and option course work. Courses used to satisfy the Pre-Veterinary Medicine option requirements also satisfy the Physics/Computer Science and Quantitative Applications, Organismal Biology, Physiology, Writing Intensive Course and Experiential Learning or Integrative Biology Elective requirements in the Biology major. Several courses may also be used to satisfy areas of the Baccalaureate Core.

Students may not pursue either the Pre-Veterinary Medicine, Pre-Dentistry, Pre-Medicine or Physiology and Behavior options within the Biology major—no dual combinations of these options are permitted.

For further information, see MyDegrees or the Integrative Biology website (http://ib.oregonstate.edu).

**Code** | **Title** | **Hours**
--- | --- | ---
VMB 110 | PREVETERINARY MEDICINE | 1
PHL 205 | *ETHICS | 4
PHL 444/REL 444 | *BIOMEDICAL ETHICS | 4
BI 319 | *CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES | 3
PH 201 | *GENERAL PHYSICS | 15
& PH 202 | and *GENERAL PHYSICS | 15
& PH 203 | and *GENERAL PHYSICS | 15
Z 350 | ANIMAL BEHAVIOR | 3
Z 422 | COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY | 5
Z 431 | VERTEBRATE PHYSIOLOGY I | 4
Z 432 | VERTEBRATE PHYSIOLOGY II & Z 442 | 5
| VERTEBRATE PHYSIOLOGY LABORATORY | 5

**Total Hours** | 43-45

**Experiential Learning or Science Elective Courses**

Select both tracks or two courses from Track II: 3-5

**Track I Experiential Learning Credits**

Select any combination of 3 credits from the following:

- BI 309 | TEACHING PRACTICUM (by approval) |
- BI 401 | RESEARCH AND SCHOLARSHIP (by approval) |
- BI 409 | ADVANCED TEACHING PRACTICUM (by approval) |

**Track II Science Elective Courses**

- ANS 311 | PRINCIPLES OF ANIMAL NUTRITION |
- BHS 415/VMB 415 | ONE HEALTH IN PRACTICE |
- BI 485 | MONSTER BIOLOGY |
- BI 495 | DISEASE ECOLOGY |
- FW 427 | PRINCIPLES OF WILDLIFE DISEASES |
- MB 480 | GENERAL PARASITOLOGY |
- TOX 411 | FUNDAMENTALS OF TOXICOLOGY |
- Z 371 | VERTEBRATE BIOLOGY (Z 372 recommended) |
- Z 425 | EMBRYOLOGY AND DEVELOPMENT |
- Z 437 | VERTEBRATE ENDOCRINOLOGY |
- Z 438 | BEHAVIORAL NEUROBIOLOGY |
- Z 473 | HERPETOLOGY |

**Total Hours** | 43-45

**Integrative Biology Graduate Major (MS, PhD)**

**Graduate Areas of Concentration**

- Behavioral ecology, behavioral endocrinology, cell biology, chemical ecology, conservation biology, developmental biology, evolutionary biology, genetics, genomics, host-microbe interactions, marine ecology, paleontology, physiology, population biology

Administrated by the Department of Integrative Biology under the School of Life Sciences.
The Department of Integrative Biology offers graduate work leading toward the Master of Science and Doctor of Philosophy degrees in all areas of biology ranging from molecular to community levels.

At present there are active research programs involving graduate students in the study of comparative immunobiology and pathology; cellular interactions and tissue differentiation; neuronal development; cytogenetics; behavioral biology at the neurophysiological, endocrinological, and ecological levels; environmental physiology; vertebrate functional morphology; reproductive biology; natural products chemistry; marine biology; physiologic and biochemical adaptation; genetics and evolution of populations; experimental marine, terrestrial, and freshwater population and community ecology; biodiversity and conservation biology.

Research is conducted in laboratories on campus, at the Malheur Field Station in southeastern Oregon, at the Hatfield Marine Science Center in Newport, the H.J. Andrews Experimental Forest, and in natural areas of the Cascade Mountains and Willamette Valley. Students also have entered into cooperative research programs in other departments, with the Oregon Health and Science University in Portland, and with the Primate Research Center in Beaverton.

As part of their training, all students participate in the departmental seminar program, and doctoral students spend at least one year as teaching assistants. Most students are supported by graduate teaching or research assistantships. Students are expected to have broad competency in biology. The master’s program leads to a thesis or research report (nonthesis option) on a specific problem; the PhD program emphasizes independent thesis research on a major topic at the forefront of the chosen field.

Major Code: 6300

**Integrative Biology Graduate Minor**

Minor Code: 6310

**Marine Biology and Ecology Minor**

Administered by the Department of Integrative Biology under the School of Life Sciences.

Minor Code: 695

The courses in the minor may be shared with major requirements. Students with a Biology major cannot declare the Marine Biology and Ecology minor (they instead complete the Marine Biology option in that major), and students cannot receive any combination of the Biology minor, Marine Biology and Ecology minor or the Marine Biology option. The minor requires the BI 211, BI 212 or BI 213 series and ST 201 or ST 351 for required course work. A term or year of chemistry is required depending on elective course choices.

The Marine Biology and Ecology minor requires one or more terms in residence at Hatfield Marine Science Center, typically during junior year. Most students take a variety of courses during the summer term (https://hmsc.oregonstate.edu/academics/courses-hmsc/summer-term/summer-courses/) at Hatfield Marine Science Center. The 15-credit BI 450 course taught each spring term at Hatfield Marine Science Center is an alternative to some core courses in the minor but is by application only. The applications for BI 450 are available the fall term before attending in the Integrative Biology Office, Cordley Hall 3029.

BI 111 is an optional weekend experiential course at Hatfield Marine Science Center that complements the minor, particularly for students with little or no previous marine experience.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 150</td>
<td>INTRODUCTION TO MARINE BIOLOGY (or select an additional Marine Elective Course below)</td>
<td>3</td>
</tr>
<tr>
<td>BI 347</td>
<td>*OCEANS IN PERIL</td>
<td>3</td>
</tr>
<tr>
<td>BI 351</td>
<td>MARINE ECOLOGY ¹</td>
<td>3</td>
</tr>
<tr>
<td>BI 353</td>
<td>PACIFIC NORTHWEST COASTAL ECOSYSTEMS (taught at Hatfield Marine Science Center)</td>
<td>4</td>
</tr>
<tr>
<td>BI 373</td>
<td>*FIELD METHODS IN MARINE ECOLOGY ¹</td>
<td>3</td>
</tr>
<tr>
<td>BOT 416</td>
<td>AQUATIC BOTANY ¹</td>
<td>4</td>
</tr>
<tr>
<td>Z 461</td>
<td>MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY (taught at Hatfield Marine Science Center) ¹</td>
<td>4</td>
</tr>
</tbody>
</table>

**Marine Elective Courses**

Select two courses from the following or three courses if you did not take BI 150: 6-8

| BI 358 | SYMBIOSES AND THE ENVIRONMENT |
| FW 302 | BIOLOGY AND CONSERVATION OF MARINE MAMMALS (taught at Hatfield Marine Science Center) |
| FW 315 | ICHTHYLOGY |
| FW 331 | ECOLOGY OF MARINE AND ESTUARINE BIRDS (taught at Hatfield Marine Science Center) |
| FW 421 | AQUATIC BIOLOGICAL INVASIONS |
| FW 493 | FIELD METHODS FOR MARINE RESEARCH (taught at Hatfield Marine Science Center) |
| MB 314 | AQUATIC MICROBIOLOGY |
| OC 201 | *OCEANOGRAPHY |

Total Hours: 30-32

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
¹ BI 450 (by application only) may be taken in place of BI 351, BI 373, BOT 416 and Z 461

Minor Code: 695

**Zoology Undergraduate Major (BS, HBS)**

Also available via Ecampus.

Administered by the Department of Integrative Biology under the School of Life Sciences.

The Zoology major offers scientific training in the diversity, organismal biology, ecology, and evolution of animals. The major core provides a solid foundation in the biological sciences while electives allow students to cater course work to meet specific interests in animal biology. Undergraduate research, internship, teaching and study abroad experience are strongly recommended, and credits can be integrated with major requirements.

Zoology majors enter such varied fields as animal care and husbandry, curatorial and museum management, laboratory animal research, field biology and conservation, and environmental management and policy. The Zoology major is not suitable for pre-veterinary medicine students as
it does not include the required prerequisite course work (see the option in Pre-Veterinary Medicine in the Biology major).

**Major Code: 620**

Students in the Biology major must complete BI 211 or BI 211H, BI 212 or BI 212H, and BI 213 or BI 213H with a C− or better to continue on to upper-division Biology (Bi) and Zoology (Z) coursework. Students must also complete their General Chemistry series and CH 331 with a C− in each term to move on to other Chemistry (CH) coursework.

Students majoring in Biology, BioHealth Sciences, Fisheries and Wildlife Sciences, or Zoology cannot seek a dual or double major in any combination of these four majors. Zoology majors cannot seek the Biology minor.

For further information, see MyDegrees or the Integrative Biology (http://ib.oregonstate.edu) website.

**Code** | **Title** | **Hours**
---|---|---

**Zoology Core Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 198</td>
<td>PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY</td>
<td>1</td>
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<tr>
<td>BI 298</td>
<td>PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II</td>
<td>1</td>
</tr>
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**Baccalaureate Core Communications Course**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING</td>
<td>3</td>
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**Baccalaureate Core Writing II Course**

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>WR 237</td>
<td>*TECHNICAL WRITING</td>
<td>3</td>
</tr>
<tr>
<td>or WR 362</td>
<td>*SCIENCE WRITING</td>
<td>3</td>
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**Quantitative and Physical Sciences Core**

Select one of the following MTH series: 8

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 251 &amp; MTH 252</td>
<td>*DIFFERENTIAL CALCULUS and INTEGRAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 227 &amp; MTH 228</td>
<td>*CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I and II</td>
<td>4</td>
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</tbody>
</table>

Select one of the following CH series: 15

**Option 1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY and LABORATORY FOR CHEMISTRY 231</td>
<td>4</td>
</tr>
<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY and LABORATORY FOR CHEMISTRY 232</td>
<td>4</td>
</tr>
<tr>
<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY and LABORATORY FOR CHEMISTRY 233</td>
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**Option 2**

<table>
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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CH 121 &amp; CH 122 &amp; CH 123</td>
<td>GENERAL CHEMISTRY and GENERAL CHEMISTRY and GENERAL CHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>CH 331 &amp; CH 332</td>
<td>ORGANIC CHEMISTRY and ORGANIC CHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>CH 337 &amp; CH 390</td>
<td>ORGANIC CHEMISTRY LABORATORY and ENVIRONMENTAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>ST 351 &amp; ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS and INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
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**Biological Sciences Core**

Select one of the following options: 12

**Option 1 (Corvallis students)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 211 &amp; BI 212 &amp; BI 213</td>
<td>*PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY</td>
<td>12</td>
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**Option 2 (Ecampus students)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BI 204 &amp; BI 205 &amp; BI 206</td>
<td>*INTRODUCTORY BIOLOGY I and II and III</td>
<td>9</td>
</tr>
<tr>
<td>BI 370 &amp; BI 311</td>
<td>ECOLOGY and GENETICS</td>
<td>4</td>
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</table>

**Select one of the following: 3-15**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 319</td>
<td>*CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES</td>
<td>3</td>
</tr>
<tr>
<td>BI 371</td>
<td>*ECOLOGICAL METHODS</td>
<td>3</td>
</tr>
<tr>
<td>BI 373</td>
<td>*FIELD METHODS IN MARINE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BI 450</td>
<td>*MARINE BIOLOGY AND ECOLOGY (by application only - Hatfield Marine Science Center)</td>
<td>3</td>
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</tbody>
</table>

**Senior Biology Field Test**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 498</td>
<td>SENIOR BIOLOGY FIELD TEST **</td>
<td>0</td>
</tr>
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</table>

**Zoology Elective Courses**

**Organismal, Physiology and Systematics Electives**

Select two 3+ credit courses from the following: 6-8

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 358</td>
<td>SYMBIOSES AND THE ENVIRONMENT</td>
<td>3</td>
</tr>
<tr>
<td>BI 485</td>
<td>MONSTER BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BOT 321</td>
<td>PLANT SYSTEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>FW 302</td>
<td>BIOLOGY AND CONSERVATION OF MARINE MAMMALS</td>
<td>3</td>
</tr>
<tr>
<td>or FW 311</td>
<td>ORNITHOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>or FW 315</td>
<td>ICHTHYOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>or FW 317</td>
<td>MAMMALOGY</td>
<td>3</td>
</tr>
<tr>
<td>or FW 331</td>
<td>ECOLOGY OF MARINE AND ESTUARINE BIRDS</td>
<td>3</td>
</tr>
<tr>
<td>MB 480</td>
<td>GENERAL PARASITOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Z 350</td>
<td>ANIMAL BEHAVIOR</td>
<td>3</td>
</tr>
<tr>
<td>Z 365</td>
<td>BIOLOGY OF INSECTS</td>
<td>3</td>
</tr>
<tr>
<td>Z 431</td>
<td>VERTEBRATE PHYSIOLOGY I</td>
<td>3</td>
</tr>
<tr>
<td>Z 440</td>
<td>INSECT PHYSIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Z 438</td>
<td>BEHAVIORAL NEUROBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Z 473</td>
<td>HERPETOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Z 477</td>
<td>AQUATIC ENTOMOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Z 478</td>
<td>VERTEBRATE BIOLOGY LABORATORY</td>
<td>2</td>
</tr>
<tr>
<td>or &amp; Z 374</td>
<td>INVERTEBRATE BIOLOGY LABORATORY</td>
<td>2</td>
</tr>
<tr>
<td>or &amp; Z 461</td>
<td>MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>or &amp; Z 450</td>
<td>*MARINE BIOLOGY AND ECOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>Z 371</td>
<td>VERTEBRATE BIOLOGY</td>
<td>5</td>
</tr>
<tr>
<td>&amp; Z 372</td>
<td>and VERTEBRATE BIOLOGY LABORATORY</td>
<td>5</td>
</tr>
<tr>
<td>or Z 374</td>
<td>DIVERSITY OF LIFE: VERTEBRATES</td>
<td>5</td>
</tr>
<tr>
<td>Z 423</td>
<td>ENVIRONMENTAL PHYSIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BI 445</td>
<td>EVOLUTION</td>
<td>3</td>
</tr>
<tr>
<td>BI 483</td>
<td>POPULATION BIOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>

**Zoology Electives Courses**

**Ecology, Evolution and Conservation Electives**

Select two 3+ credit courses from the following: 6-8

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 301</td>
<td>*HUMAN IMPACTS ON ECOSYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>or BI 348</td>
<td>*HUMAN ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BI 351</td>
<td>MARINE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>or BI 450</td>
<td>*MARINE BIOLOGY AND ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BI 353</td>
<td>PACIFIC NORTHWEST COASTAL ECOSYSTEMS (taught at Hatfield Marine Science Center)</td>
<td>3</td>
</tr>
<tr>
<td>BI 375</td>
<td>FIELD METHODS IN ECOLOGICAL RESTORATION (taught at OSU-Cascades)</td>
<td>3</td>
</tr>
<tr>
<td>BI 427</td>
<td>PALEOBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BI 481</td>
<td>BIOGEOGRAPHY</td>
<td>3</td>
</tr>
<tr>
<td>BI 495</td>
<td>DISEASE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>BOT 341</td>
<td>PLANT ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>FES 440</td>
<td>WILDLAND FIRE ECOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>or FES 445</td>
<td>ECOLOGICAL RESTORATION</td>
<td>3</td>
</tr>
<tr>
<td>or FW 445</td>
<td>ECOLOGICAL RESTORATION</td>
<td>3</td>
</tr>
<tr>
<td>FW 311</td>
<td>INTRODUCTORY POPULATION DYNAMICS</td>
<td>3</td>
</tr>
<tr>
<td>or FW 421</td>
<td>AQUATIC BIOLOGICAL INVATIONS</td>
<td>3</td>
</tr>
<tr>
<td>or FW 427</td>
<td>PRINCIPLES OF WILDLIFE DISEASES</td>
<td>3</td>
</tr>
<tr>
<td>or FW 479</td>
<td>WETLANDS AND RIPARIAN ECOLOGY</td>
<td>3</td>
</tr>
</tbody>
</table>
**Biodiversity:** Causes, Consequences, and Conservation 6-8
Select two 3+ credit courses from the following: 6

- AEC 250 *Introduction to Environmental Economics and Policy
- or AEC 253 *Environmental Law, Policy, and Economics
- AEC 422 Environmental Law
- ANS 280 Companion Animal Management
- BI 347 *Oceans in Peril
- BI 348 *Human Ecology
- or BI 301 *Human Impacts on Ecosystems
- FES 355 Management for Multiple Resource Values
- FES 412 Forest Entomology
- FES 452/FW 452 Biodiversity Conservation in Managed Forests
- FES 485 *Consensus and Natural Resources
- FOR 436 Wildland Fire Science and Management
- FOR 462 Natural Resource Policy and Law
- FW 350 *Endangered Species, Society and Sustainability
- FW 451 Avian Conservation and Management
- FW 458 Mammal Conservation and Management
- FW 462 Ecosystem Services
- GEOG 450 Land Use in the American West
- PS 475 Environmental Politics and Policy
- PS 477 International Environmental Politics and Policy
- SOC 481 *Society and Natural Resources
- TRAL 352 Wilderness Management
- or TRAL 357 *Parks and Protected Areas Management

### Experiential Learning or Skills Elective
Select one of the following two tracks: 3

#### Track I Experiential Learning Credits
Select any combination of three credits from the following:

- BI 309 Teaching Practicum (by approval)
- BI 401 Research and Scholarship (by approval)
- BI 406 Projects: Curatorial Assistant (by approval)
- BI 409 Advanced Teaching Practicum (by approval)
- BI 410 Internship (by approval)
- OSU international internships (INTL credits) by approval

### Track II Skills Course
Select one course from the following: 3-4

- ANS 345 Applied Animal Behavior
- BI 375 Field Methods in Ecological Restoration (if not used above, taught at OSU-Cascades)
- BI 450 *Marine Biology and Ecology (by application only - taught at Hatfield Marine Science Center)
- BOT 425 Flora of the Pacific Northwest
- BOT 440 Field Methods in Plant Ecology
- CS 161 Introduction to Computer Science I
- FES 430 Forest as Classroom
- FW 255 Field Sampling of Fish and Wildlife
- FW 493 Field Methods for Marine Research (taught at Hatfield Marine Science Center)
- GEOG 360 GIScience I: Geographic Information Systems and Theory
- GRAD 430 Introduction to Scientific Diving
- KIN 232 Backcountry Leadership
- NR 325 Scientific Methods for Analyzing Natural Resource Problems
- RNG 353 Wildland Plant Identification
- RNG 441 Rangeland Analysis
- SED 435 Communicating Ocean Sciences to Informal Audiences
- TRAL 493 Environmental Interpretation

**Total credits required for graduation:** 180

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

1 • If FW 302 is selected, FW 301 is optional but recommended - FW 311 is taught at Hatfield Marine Science Center
• If FW 311 is selected, FW 312 is optional but recommended
• If FW 317 is selected, FW 316 is optional but recommended
• FW 331 is taught at Hatfield Marine Science Center

+ BI 450 (by application only), Z 461 and FW 421 are taught at Hatfield Marine Science Center. Z 364 and Z 374 are taught via Ecampus only
++ Zoology majors are required to take a comprehensive, two-hour Biology Major Field Test their final OSU term (or spring term if they will graduate in summer) in order to graduate: BI 498. For further information, visit the Integrative Biology (http://ib.oregonstate.edu/advising/MFT-info/) website

### Major Code: 620

#### Track I

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 198</td>
<td>Professional Development I: Biology and Zoology</td>
<td>1</td>
</tr>
<tr>
<td>CH 121</td>
<td>General Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>or CH 231 and CH 261</td>
<td>General Chemistry and Laboratory for Chemistry 231</td>
<td></td>
</tr>
<tr>
<td>MTH 111</td>
<td>*College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 112</td>
<td>*Elementary Functions</td>
<td></td>
</tr>
<tr>
<td>HHS 231</td>
<td>*Lifetime Fitness for Health (or PAC Course)</td>
<td>1-2</td>
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**Hours:** 14-15

#### Winter

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 122</td>
<td>*General Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>or CH 232 and CH 262</td>
<td>*General Chemistry and Laboratory for Chemistry 232</td>
<td></td>
</tr>
<tr>
<td>MTH 112</td>
<td>*Elementary Functions</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 251</td>
<td>*Differential Calculus</td>
<td></td>
</tr>
<tr>
<td>Two Bacc Core courses</td>
<td></td>
<td>6</td>
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**Hours:** 15

#### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>BI 298</td>
<td>Professional Development for Biologists II</td>
<td>1</td>
</tr>
<tr>
<td>CH 123</td>
<td>*General Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>or CH 233 and CH 263</td>
<td>*General Chemistry and Laboratory for Chemistry 233</td>
<td></td>
</tr>
<tr>
<td>MTH 251</td>
<td>*Differential Calculus</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 227</td>
<td>*Calculus and Probability for the Life Sciences I</td>
<td></td>
</tr>
<tr>
<td>Two Bacc Core courses</td>
<td></td>
<td>6</td>
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**Hours:** 16

#### Second Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*Principles of Biology</td>
<td>4</td>
</tr>
<tr>
<td>CH 331</td>
<td>Organic Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252 or MTH 228</td>
<td>Integral Calculus</td>
<td>4</td>
</tr>
<tr>
<td>or MTH 228</td>
<td>or Calculus and Probability for the Life Sciences II</td>
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<tr>
<td>Bacc Core</td>
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**Hours:** 15

#### Winter

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BI 212</td>
<td>*Principles of Biology</td>
<td>4</td>
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### Track II

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI 198</td>
<td>PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CH 121</td>
<td>GENERAL CHEMISTRY</td>
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<tr>
<td>or CH 231 and CHEMISTRY 231</td>
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<td>or CH 261 and CHEMISTRY 233</td>
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<tr>
<td>or GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 235</td>
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<tr>
<td>Bacc Core</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH (or PAC Course)</td>
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<tr>
<td><strong>Winter</strong></td>
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<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>CH 122</td>
<td>*GENERAL CHEMISTRY</td>
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<tr>
<td>or CH 232 and CHEMISTRY 233</td>
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<td>Two Bacc Core courses</td>
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### Second Year

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<tr>
<td>BI 311</td>
<td>GENETICS</td>
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<tr>
<td>or BB 314</td>
<td>or *CELL AND MOLECULAR BIOLOGY</td>
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<tr>
<td>or Bi 371</td>
<td>or *ECOLOGICAL METHODS</td>
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<tr>
<td>or CH 445</td>
<td>or *EVOLUTION</td>
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<tr>
<td>or Z 423</td>
<td>or *INVERTEBRATE BIOLOGY</td>
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<tr>
<td>or Z 426</td>
<td>or *INVERTEBRATE BIOLOGY LABORATORY</td>
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<tr>
<td>Writing Intensive Course or Organismal, Physiology and Systematics Elective</td>
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<td>Ecology, Evolution and Conservation Elective or Natural Resource, Management and Policy Elective</td>
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<td><strong>Spring</strong></td>
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<td>BI 311</td>
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<td>or BB 314</td>
<td>or *CELL AND MOLECULAR BIOLOGY</td>
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<td>or Bi 371</td>
<td>or *ECOLOGICAL METHODS</td>
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<td>or CH 445</td>
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<td><strong>Third Year</strong></td>
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<td>or BB 314</td>
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<tr>
<td>or Bi 370</td>
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<td>or CH 332</td>
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<td>or *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I</td>
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<td>or MTH 232</td>
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<td>BI 483</td>
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<td>or Bi 370</td>
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<td>or CH 332</td>
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<td>or CHEMISTRY 390</td>
<td>or *ENVIRONMENTAL CHEMISTRY</td>
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<td>or ST 351</td>
<td>or *INTRODUCTION TO STATISTICAL METHODS</td>
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<td>or Z 361</td>
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<tr>
<td>or Z 362</td>
<td>or *INVERTEBRATE BIOLOGY LABORATORY</td>
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<td><strong>Winter</strong></td>
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<td>BI 498</td>
<td>SENIOR BIOLOGY FIELD TEST</td>
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<td>Add electives to reach 180 credits by graduation</td>
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<td><strong>Total Hours</strong></td>
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Microbiology

The Department of Microbiology is part of the School of Life Sciences.

Microbiology is concerned with the forms and activities of bacteria, archaea, fungi, protozoa, and viruses. It plays varied roles in the practical applications of technology and medicine, as well as in the most theoretical problems of biology. Microbiologists are involved in activities as different as the study of gene structure, the control of disease, and the industrial processes based on the ability of microorganisms to decompose and synthesize complex organic molecules. Microbiology is one of the most rewarding of professions because it provides the opportunity to be in contact with all the other natural sciences and thus to contribute in many different ways to the betterment of life.

Undergraduate Studies in Microbiology

Many fields of microbiology are available to students and research workers. These include fundamental areas such as the physiology, ecology, and genetics of microorganisms; and the applications of microbiology concerned with soil and water quality, food safety, immunology, and human, animal and plant diseases. Undergraduate studies prepare students for admission to professional schools, graduate programs in microbiology, and for positions in education and as health officers, sanitariners and biotechnicians in private industry, state and federal government.

High school students or community college transferees considering a career in microbiology will find it helpful to have a strong background in mathematics and chemistry. An excellent advising program is available to undergraduates, and prospective students are encouraged to consult with a departmental advisor or with faculty members working in an area of interest to them. Upper-division students are also encouraged to carry out a research project in the laboratory of a faculty member and/or to serve as an undergraduate teaching assistant. Several partial scholarships are available for microbiology majors. For more information, contact a microbiology advisor.

Undergraduate Studies in BioHealth Sciences

Specialized programs are offered to students who wish to pursue careers in health-related fields. Such programs provide excellent academic preparation for students who plan to enter medical, pharmacy, or dental school, and for those choosing careers in physician assistant, physical therapy, optometry, clinical laboratory science, and podiatry. The curricula of the BioHealth Sciences major and accompanying options generally fulfills requirements at the respective professional schools. Because specific requirements vary from school to school, it is the student’s responsibility to check requirements for any school to which the student plans to apply.

Graduate Studies

The Department of Microbiology offers graduate programs leading to the Master of Science and Doctor of Philosophy degrees. Major fields of study in the program include molecular biology, microbial physiology, genetics, virology, soil and aquatic microbiology, immunology, pathogenic microbiology, and microbial genomes. The department also participates in the Master of Arts in Interdisciplinary Studies program. Students in both the master’s and PhD programs are required to complete a research project leading to a thesis. Students pursuing the PhD degree must complete both written and oral qualifying examinations. Teaching and research assistantships are available.

For additional information, contact the department head or other faculty members conducting research in areas that are of interest.

Undergraduate Programs

Major

• BioHealth Sciences (p. 1025)

Options:

• Pre-Clinical Laboratory Science
• Pre-Dentistry
• Pre-Medicine/Pre-Podiatry
• Pre-Optometry
• Pre-Pharmacy
• Pre-Physical Therapy
• Pre-Physician Assistant

• Microbiology (p. 1031)

Options:

• Aquatic Microbiology
• Pre-Medicine/Microbiology
Minor
- Microbiology (p. 1031)

Graduate Programs
Major
- Microbiology (p. 1030)

Minor
- Microbiology (p. 1031)

Jerri Bartholomew, Head
226 Nash Hall
Oregon State University
Corvallis, OR 97331-3804
Phone (Microbiology): 541-737-4441
Phone (BioHealth Sciences): 541-737-3875
Email: Jerri.Bartholomew@oregonstate.edu
(barholj@science.oregonstate.edu)
Website: http://microbiology.science.oregonstate.edu/

Faculty
Professors Bartholomew, Bermudez, Dreher, Field, Giovannoni, Kent, Ream, Sarker, Schuster, Trempy
Emeritus Faculty Bottomley, Geller, Rohrmann
Associate Professors Vega-Thurber, Halsey, Mueller, Sharpton
Assistant Professors David, Thurber, Lowry
Senior Instructor/Advisor Bruslind
Instructor/Advisor Evans, Hokanson, Massoni

BioHealth Sciences

BHS 107. HEALTH PROFESSIONS: DENTAL. (1 Credit)
Discussion of matters relating to a dental career. Includes application procedures, the importance of various requirements, admissions, professional school curricula, financing education and related matters. Speakers are included. Graded P/N.

BHS 110. BIOHEALTH SCIENCES ORIENTATION. (1 Credit)
Introduction of incoming BioHealth Sciences students to college life with an emphasis on facilities, services, and curricula in BHS. Exposure to career opportunities for students interested in the BioHealth Sciences. Graded P/N.

BHS 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BHS 211. PROFESSIONAL DEVELOPMENT II: MOLECULAR, MICROBIAL, BIOHEALTH. (1 Credit)
Develop awareness of the elements of professional development, identify strategic areas for growth, and design an exploration plan. Emphasis is placed on being able to analyze career opportunities to determine the best mix of technical and professional skills needed for success as a biological science professional. Graded P/N. CROSSLISTED as BB 211 / BHS 211.
This course is repeatable for 16 credits.

BHS 255. ALLIED HEALTH MICROBIOLOGY. (4 Credits)
General properties of cellular microbes and viruses, microbial biochemistry and genetics, pathogenesis and disease, immunity, and microbial infections. Lecture and lab emphasis is on medical microbiology, infectious diseases, and public health. Not intended for biological sciences majors. Lec/lab. CROSSLISTED as BHS 255/MB 255.
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: MB 255

BHS 316. PRINCIPLES OF IMMUNOLOGY. (3 Credits)
Interactions of the innate and adaptive immune responses in the context of infectious diseases, autoimmune diseases, immunodeficiencies and immunotherapies. This course is designed for non-microbiology majors.
Prerequisites: MB 230 with C- or better or ((BI 212 with C- or better or BI 212H with C- or better) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-])
Equivalent to: MB 320

BHS 320. HUMAN BACTERIOLOGY. (4 Credits)
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or ((BI 211 [C-] or BI 211H [C-]) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]))
Equivalent to: MB 320

BHS 323. MICROBIAL INFLUENCES ON HUMAN HEALTH. (3 Credits)
How microorganisms contribute in beneficial and detrimental ways to human health. Emphasis on microbial contributions to cancer, gut health, chronic infection and autoimmune diseases. This course is part of the Writing Intensive Curriculum for the BioHealth Sciences major. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MB 302 with D- or better or (BB 314 with D- or better or BB 314H with D- or better) or BB 450 with D- or better

BHS 329. MECHANISMS OF DISEASE: INTRODUCTION TO GENERAL PATHOLOGY. (3 Credits)
An introduction to basic principles of disease, focused on structural and functional changes of cells, tissues and organs, and their relationships to clinical disease. The emphasis of the course is at the cellular to organ level, but will cover some on molecular mechanisms as pertinent.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-])

BHS 340. HUMAN VIROLOGY. (4 Credits)
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or ((BI 211 [C-] or BI 211H [C-]) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]))
Equivalent to: MB 340

BHS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BHS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BHS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
MB 201. LABORATORY SKILLS. (1-16 Credits)
These credits are designed for students who are doing experiential learning in a research laboratory on campus, performing basic laboratory tasks that are not elevated to the level of an independent research project. Graded P/N.
This course is repeatable for 16 credits.

MB 230. *INTRODUCTORY MICROBIOLOGY. (4 Credits)
Microbiology as it affects our everyday lives. The impact of microorganisms on health, food/water sanitation, environment, industry, and genetic engineering. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: MB 230H

MB 230H. *INTRODUCTORY MICROBIOLOGY. (4 Credits)
Microbiology as it affects our everyday lives. The impact of microorganisms on health, food/water sanitation, environment, industry, and genetic engineering. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: MB 230

MB 255. *ALLIED HEALTH MICROBIOLOGY. (4 Credits)
General properties of cellular microbes and viruses, microbial biochemistry and genetics, pathogenesis and disease, immunity, and microbial infections. Lecture and lab emphasis is on medical microbiology, infectious diseases, and public health. Not intended for biological sciences majors. Lec/lab. CROSSLISTED as BHS 255/MB 255.
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BHS 255

MB 290. SUCCESS IN MICROBIOLOGY. (1 Credit)
Science skills, science literacy, ethics, and professional development to build a successful career in Microbiology. Learn the process of research, access and analyze primary literature, evaluate user-generated science content, practice professional skills, and identify and plan for experience-building opportunities such as jobs, research and internships. Sophomore standing or higher.

MB 299. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies.
Equivalent to: MB 299H
This course is repeatable for 16 credits.

MB 299H. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: MB 299
This course is repeatable for 16 credits.

MB 302. GENERAL MICROBIOLOGY. (3 Credits)
Emphasis on cytology, physiology, virology, growth and control of growth with coverage of the role of microorganisms in nature, in disease, and as useful tools.
Prerequisites: (CH 332 with C- or better or CH 335 with C- or better) and ((BI 212 with C- or better or BI 212H with C- or better) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

MB 303. GENERAL MICROBIOLOGY LABORATORY. (2 Credits)
Development of laboratory techniques; exercises designed to reinforce concepts covered in MB 302. MB 302 is a prereq that may be taken prior to or concurrently with MB 303. Lec/lab.
Prerequisites: MB 302 (may be taken concurrently) with D- or better
Equivalent to: MB 303H
 Recommended: Two terms organic chemistry
MB 310. BACTERIAL MOLECULAR GENETICS. (3 Credits)
Introductory concepts of bacterial molecular genetics. Topics include DNA replication, mutation, DNA repair, DNA recombination, transposons, bacteriophages, genetic manipulation, and gene regulation.
Prerequisites: MB 302 with D- or better and (BB 314 [D-] or BB 314H [D-]) and (BB 450 [D-] or BB 490 [D-]) and (BB 451 may be taken concurrently) [D-] or BB 491 (may be taken concurrently) [D-]
Equivalent to: MB 306

MB 311. *MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE. (3 Credits)
Scientific writing, laboratory notebook composition, experimental design, and laboratory experiments in bacterial molecular biology. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 310 (may be taken concurrently) [D-]
Equivalent to: MB 307

MB 312. BACTERIAL PHYSIOLOGY AND METABOLISM. (3 Credits)
Molecular structure and function, macromolecular assembly, energy production and use, and cellular growth.
Prerequisites: MB 310 with D- or better and BB 451 [D-]
Equivalent to: MB 304
Recommended: BB 450

MB 314. AQUATIC MICROBIOLOGY. (3 Credits)
A survey of the diversity, ecology, and physiology of microbes in aquatic systems, with emphasis on their roles in food webs, chemical cycling, and human health. Provides the background knowledge and quantitative/analytical skills necessary to interpret and critique current and historical research in the fields of general aquatic microbiology.
Prerequisites: (CH 231 with D- or better or CH 231H with D- or better or CH 121 with D- or better) and (CH 232 [D-] or CH 232H [D-] or CH 122 [D-]) and (CH 233 [D-] or CH 233H [D-] or CH 123 [D-])

MB 320. HUMAN BACTERIOLOGY. (4 Credits)
Properties of bacteria, their biology, pathogenesis and concern to society. Emphasis on the role of bacteria in human health and disease. CROSSLISTED as BHS 320/MB 320
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or ((BI 211 [C-] or BI 211H [C-]) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])
Equivalent to: BHS 320

MB 330. *DISEASE AND SOCIETY. (3 Credits)
Infectious disease has many effects on the development of society, and likewise, human interactions affect the development of disease. The course examines these interactions with a focus on the role of race, class, and economic status in the development of epidemics. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

MB 340. HUMAN VIROLOGY. (4 Credits)
Properties of viruses, their biology, pathogenesis and concern to society. Emphasis on viruses causing human disease. CROSSLISTED as BHS 340/MB 340
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or ((BI 211 [C-] or BI 211H [C-]) and (BI 212 [C-] and BI 213 [C-])
Equivalent to: BHS 340

MB 385. *EMERGING INFECTIOUS DISEASES AND EPIDEMICS. (3 Credits)
Emerging and reemerging infectious disease is a contemporary global issue of great concern. To understand and evaluate the issue, the course covers germ theory, disease history and ecology, microbial pathogenesis and the immune response, historic plagues, and the biological, environmental, population and social changes that contribute to disease emergence. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-]) and BI 213 [D-] or (BI 213H [D-])
Equivalent to: BI 385

MB 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

MB 399H. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: MB 399H
This course is repeatable for 16 credits.

MB 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MB 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

MB 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: MB 405
Conference: Instruction in microbiology.
This course is repeatable for 16 credits.

MB 406. SPECIAL PROJECTS. (1-16 Credits)
Equivalent to: MB 406
Reading and Conference/instructor in Microbiology.
This course is repeatable for 16 credits.

MB 407. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

MB 410. OCCUPATIONAL INTERNSHIP. (1-10 Credits)
Supervised work experience at selected cooperating institutions, agencies, laboratories, clinics or companies. Maximum of 10 credits allowed but no more than 3 credits may be used to satisfy microbiology major requirement of 36 credits. Graded P/N.
This course is repeatable for 10 credits.

MB 416. IMMUNOLOGY. (3 Credits)
Basic theory and applications of immunochemistry, immunogenetics, and cellular immunology. Examination of immunologically related diseases.
Prerequisites: BB 450 with D- or better or BB 490 with D- or better

MB 417. IMMUNOLOGY LABORATORY. (2 Credits)
Laboratory on the applications of current immunological techniques.
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 416 (may be taken concurrently) [D-]

MB 420. MICROBIAL GENOMES, BIOGEOCHEMISTRY, AND DIVERSITY. (3 Credits)
A survey of microbial diversity from the earliest lifeforms to the modern role of bacteria and archaea in global biogeochemical cycles. Topics covered include molecular evolution, microbial genomics, biochemical diversity, and metabolic pathways that adapt cells to extreme environments. Particular emphasis is placed on marine systems, from photosynthesis in surface waters to life in the ocean crust.
Prerequisites: BB 451 with D- or better
MB 422. AQUATIC MICROBIOLOGY LABORATORY. (2 Credits)
Laboratory analyzing field samples from freshwater and marine systems to examine patterns of microbial communities.
Prerequisites: MB 303 with D- or better and MB 314 [D-]

MB 430. BACTERIAL PATHOGENESIS. (3 Credits)
Bacteria pathogenic for humans, emphasizing the structural, physiological and genetic mechanisms of pathogenesis. Role of the immune system in pathogenesis and protection.
Prerequisites: MB 302 with D- or better and MB 310 (D-) and (BB 451 (D-) or BB 491 (D-))

MB 434. VIROLOGY. (3 Credits)
Properties of viruses, their biology and pathogenesis. Emphasis on viruses causing human disease.
Prerequisites: ((BB 450 with D- or better or BB 450H with D- or better) and (BB 451 (D-) or BB 451H (D-))) or (BB 490 (D-) and BB 491 (D-)) and BB 492 (D-)

MB 435. PATHOGENIC MICROBES LABORATORY. (2 Credits)
Laboratory experiments to illustrate concepts presented in MB 430 and/or MB 434, focusing on pathogenic microorganisms.
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 302 (D-) and MB 430 (may be taken concurrently) (D-) or MB 434 (may be taken concurrently) (D-)

MB 436. THE HUMAN MICROBIOME. (3 Credits)
Examines the biodiversity, function, and medical importance of the communities of microorganisms that inhabit the human body. A diverse array of topics will be discussed, including how the human microbiome is studied, case studies of specific aspects of the human microbiome, and emerging theories of how the microbiome influences human health.
Prerequisites: BI 314 with D- or better or BB 314 with D- or better or BI 314H with D- or better or MB 302 or MB 303 or other upper-division laboratory course.

MB 440. FOOD MICROBIOLOGY. (3 Credits)
Role of microorganisms in food spoilage, infection, and intoxication; also basic principles in contamination control and germicidal treatment during processing, preparing, and distributing food for consumption.
Prerequisites: MB 302 with D- or better

MB 441. FOOD MICROBIOLOGY LABORATORY. (2 Credits)
Laboratory techniques to accompany MB 440/MB 540.
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 440 (may be taken concurrently) (D-)
Recommended: MB 302

MB 448. MICROBIAL ECOLOGY. (3 Credits)
A comparison of soil sediments and freshwater as microbial habitats. Discussion of the role of microorganisms in nutrient cycles, effects of microbial activity on plant and animal life.
Prerequisites: MB 302 with D- or better

MB 456. MICROBIAL GENETICS AND BIOTECHNOLOGY. (3 Credits)
General biology of natural, genetically engineered, and composite plasmids. Major topics include extrachromosomal DNA replication, plasmid transmission, insertion elements, transposons, gene expression, and recombinant DNA vectors. Biotechnological applications and molecular genetic tools are emphasized.
Prerequisites: MB 302 with D- or better and (BB 450 (D-) or BB 490 (D-)) and (BB 451 (D-) or BB 491 (D-)) and (MB 310 (D-) or BB 492 (D-))

MB 479. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSLISTED as FST 479/MB 479 and FST 579/MB 579.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 (C-) and CH 332 (C-) and (BB 350 (D-) or BB 450 (D-)) and MB 302 (D-)
Equivalent to: FST 479

MB 480. GENERAL PARASITOLOGY. (3 Credits)
Introduction to parasitology. The course emphasizes medical parasitology, but will cover a broad overview of parasitology, covering important groups and host/parasite relationships among all taxa from invertebrates to vertebrates, including mammals.
Recommended: BI 314 or BB 450 or Z 361 or MB 302

MB 490. MICROBIOLOGY CAPSTONE EXPERIENCE. (2 Credits)
Capstone experience for microbiology students to practice professional skills necessary to sustain a career in science. Students will work in teams to analyze research data and communicate this analysis, in addition to explore career opportunities and learn how to successfully compete for jobs. Graded P/N.
Prerequisites: MB 302 with D- or better

MB 491. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: FW 491
Recommended: 9 credits of upper-division fisheries or biology.

MB 496. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSLISTED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: FW 496
Recommended: MB 303 or other upper-division laboratory course.

MB 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: One term of biology

MB 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MB 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MB 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MB 507. SEMINAR. (1 Credit)
Graded P/N.
This course is repeatable for 99 credits.

MB 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

MB 511. SCIENTIFIC SKILLS. (1 Credit)
Foundational skills for success in graduate school. Students will also become familiar with ongoing research programs in three active programs in the Microbiology Program.
MB 512. HIGHLIGHTS OF MICROBIOLOGY. (1 Credit)
Recommended:
Designed for students to gain familiarity with the history of microbiology through reading, reviewing and writing about great papers in the field. Students also meet the Microbiology Program faculty and students, and learn about some of the research in the Microbiology Program through attending colloquium.

MB 513. MICROBIAL SYSTEMS. (3 Credits)
Presentation of a modern view of microbiology through the lens of microbes’ influences on our planet’s habitats and inhabitants. Discusses current research and the use of advanced techniques to illustrate how microbiology is contributing to many cross-disciplinary problems that can involve engineering, public health, sociology, ecology, geology, etc.

MB 516. IMMUNOLOGY. (3 Credits)
Basic theory and applications of immunochemistry, immunogenetics, and cellular immunology. Examination of immunologically related diseases. Recommended: BB 450 or BB 490

MB 517. IMMUNOLOGY LABORATORY. (2 Credits)
Laboratory on the applications of current immunological techniques. Recommended: (MB 303 or MB 303H) and completion or concurrent enrollment in MB 516

MB 520. MICROBIAL GENOMES, BIOGEOCHEMISTRY, AND DIVERSITY. (3 Credits)
A survey of microbial diversity from the earliest lifeforms to the modern role of bacteria and archaea in global biogeochemical cycles. Topics covered include molecular evolution, microbial genomics, biochemical diversity, and metabolic pathways that adapt cells to extreme environments. Particular emphasis is placed on marine systems, from photosynthesis in surface waters to life in the ocean crust. Recommended: BB 451 or BB 551

MB 530. BACTERIAL PATHOGENESIS. (3 Credits)
Bacteria pathogenic for humans, emphasizing the structural, physiological and genetic mechanisms of pathogenesis. Role of the immune system in pathogenesis and protection. Recommended: MB 302 and MB 310 and (BB 451 or BB 491)

MB 534. VIROLOGY. (3 Credits)
Properties of viruses, their biology and pathogenesis. Emphasis on viruses causing human disease. Recommended: ((BB 450 or BB 450H) and (BB 451 or BB 451H)) or (BB 490 and BB 491 and BB 492)

MB 540. FOOD MICROBIOLOGY. (3 Credits)
Role of microorganisms in food spoilage, infection, and intoxication; also basic principles in contamination control and germicidal treatment during processing, preparing, and distributing food for consumption. Recommended: MB 302

MB 541. FOOD MICROBIOLOGY LABORATORY. (2 Credits)
Laboratory techniques to accompany MB 440/MB 540. Prerequisites: MB 540 (may be taken concurrently) with C or better Recommended: MB 302 and MB 303

MB 548. MICROBIAL ECOLOGY. (3 Credits)
A comparison of soil sediments and freshwater as microbial habitats. Discussion of the role of microorganisms in nutrient cycles, effects of microbial activity on plant and animal life. Recommended: MB 302

MB 555. BIOLOGY OF THE PROKARYOTES. (3 Credits)
An integrative graduate course examining bacterial and archaeal life at different levels of biological organization, emphasizing current research and analysis of primary literature. The various life styles of prokaryotes are the common theme of the course. Topics include biofilms, cooperation and communication, development, stress responses, metabolic interactions involved in global nutrient cycling. Offered every even year in winter term. Recommended: BB 450 and MB 310 and MB 312

MB 556. MICROBIAL GENETICS AND BIOTECHNOLOGY. (3 Credits)
General biology of natural, genetically engineered, and composite plasmids. Major topics include extrachromosomal DNA replication, plasmid transmission, insertion elements, transposons, gene expression, and recombinant DNA vectors. Biotechnological applications and molecular genetic tools are emphasized. Recommended: MB 302 and (BB 450 or BB 490) and (BB 451 or BB 491) and (MB 310 or BB 492)

MB 579. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSLISTED as FST 479/MB 479 and FST 579/MB 579. Equivalent to: FST 579
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and (BB 350 or BB 450) and MB 302

MB 580. GENERAL PARASITOLOGY. (3 Credits)
Introduction to parasitology. The course emphasizes medical parasitology, but will cover a broad overview of parasitology, covering important groups and host/parasite relationships among all taxa from invertebrates to vertebrates, including mammals. Recommended: BI 314 or BB 450 or Z 361 or MB 302

MB 591. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591. Equivalent to: FW 591
Recommended: 9 credits of upper-division fisheries or biology.

MB 596. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSLISTED as FW 496/MB 496 and FW 596/MB 596. Equivalent to: FW 596
Recommended: MB 303 or other upper-division laboratory course.

MB 599. SELECTED TOPICS. (0-6 Credits)
This course is repeatable for 24 credits.

MB 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MB 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
BioHealth Sciences Undergraduate Major (BS, HBS)

Administered by the Department of Microbiology under the School of Life Sciences.

The undergraduate BS degree in BioHealth Sciences is designed for students seeking an interdisciplinary background in the life sciences, public health, and social sciences. The major consists of a comprehensive core with a strong biological and physical science foundation combined with a variety of health and social science courses in a unique blend formulated to meet the needs of students interested in a career in the healthcare field. BioHealth Sciences majors receive excellent training for a variety of professional programs.

Students may elect to complete one transcript-visible option in Pre-Clinical Laboratory Science, Pre-Dentistry, Pre-Medicine/Pre-Podiatry, Pre-Optometry, Pre-Pharmacy, Pre-Physical Therapy, or Pre-Physician Assistant. An option is not required. Options in the BHS major require additional credits beyond the basic BHS major, although most students can complete the BHS core plus the additional course work in four years.

Major Code: 606

Students in the BHS major must complete the following with a C– or better:

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<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>BI 211</td>
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<tr>
<td>or BI 211H</td>
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<td>BI 212</td>
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<tr>
<td>CH 231</td>
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<tr>
<td>&amp; CH 261</td>
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<td>CH 232</td>
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<td>CH 233</td>
<td>GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233</td>
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<td>&amp; CH 263</td>
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<td>CH 331</td>
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### BioHealth Sciences Core Courses

<table>
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<tbody>
<tr>
<td>BHS 110</td>
<td>BIOHEALTH SCIENCES ORIENTATION</td>
<td>1</td>
</tr>
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</table>

#### Mathematics and Statistics Core

| ST 201 | PRINCIPLES OF STATISTICS                   | 4     |
| or ST 351 | INTRODUCTION TO STATISTICAL METHODS    |       |

Select two MTH courses from the following:

| MTH 111 | *COLLEGE ALGEBRA                           |       |
| MTH 112 | *ELEMENTARY FUNCTIONS                      |       |
| MTH 227 | *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I |       |
| MTH 228 | *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II |     |
| MTH 251 | *DIFFERENTIAL CALCULUS                     |       |
| MTH 252 | INTEGRAL CALCULUS                          |       |

#### Chemistry and Physics Core

| CH 231 | GENERAL CHEMISTRY                           | 5     |
| & CH 261 | GENERAL CHEMISTRY                           |       |
| CH 232 | GENERAL CHEMISTRY                           | 5     |
| & CH 262 | GENERAL CHEMISTRY                           |       |
| CH 331 | ORGANIC CHEMISTRY                           | 8     |
| & CH 332 | ORGANIC CHEMISTRY                           |       |
| CH 337 | ORGANIC CHEMISTRY LABORATORY                | 4     |
| PH 201 | *GENERAL PHYSICS                            | 15    |
| & PH 202 | *GENERAL PHYSICS                            |       |
| & PH 203 | *GENERAL PHYSICS                            |       |

#### Biological Sciences Core

| BI 211 | *PRINCIPLES OF BIOLOGY                      | 12    |
| & BI 212 | *PRINCIPLES OF BIOLOGY                     |       |
| & BI 213 | *PRINCIPLES OF BIOLOGY                     |       |
| MB 302 | GENERAL MICROBIOLOGY                        | 3     |
| MB 303 | GENERAL MICROBIOLOGY LABORATORY             | 2     |
| MB 310 | BACTERIAL MOLECULAR GENETICS                | 3-4   |
| or BI 311 | GENETICS                                |       |
| MB 416 | IMMUNOLOGY                                 | 3     |
| or BHS 316 | PRINCIPLES OF IMMUNOLOGY                   |       |

#### Writing Intensive Course

Select one of the following WIC courses:

| BHS 323 | *MICROBIAL INFLUENCES ON HUMAN HEALTH       |       |
| MB 385 | *EMERGING INFECTIOUS DISEASES AND EPIDEMICS |       |

#### Health and Social Sciences Core

| H 210 | *INTRODUCTION TO THE HEALTH CARE SYSTEM     | 3     |
| H 225 | *SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS | 4     |
| PHAR 210 | TERMINOLOGY OF THE HEALTH SCIENCES        | 2     |
| PSY 201 | *GENERAL PSYCHOLOGY                        | 3     |
| PSY 202 | *GENERAL PSYCHOLOGY                        | 3     |

Select two of the following Cultural Competency courses:

| ANTH 240 | INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY     | 6-8   |
| ANTH 345 | *BIOLOGICAL AND CULTURAL CONSTRUCTIONS OF RACE |       |
| ANTH 361/FCSJ 361 | *FOOD JUSTICE | |
| ECON 383 | *THE ECONOMICS OF DISCRIMINATION           |       |
| ES 351 | *ETHNIC MINORITIES IN OREGON               |       |
| ES 353 | *ENVIRONMENTAL RACISM                      |       |
| HDFS 201 | *CONTEMPORARY FAMILIES IN THE U.S.         |       |
| MB 330 | *DISEASE AND SOCIETY                       |       |
| PHL 280 | *ETHICS OF DIVERSITY                       |       |
| PSY 426 | *PSYCHOLOGY OF GENDER                      |       |
### BioHealth Sciences Undergraduate Major (BS, HBS)

**PSY 466/WGSS 466**  
**FAT STUDIES**

**QS 262/WGSS 262**  
**INTRODUCTION TO QUEER STUDIES**

**SPAN 221**  
SPANISH FOR MEDICAL PROFESSIONS I

**SPAN 222**  
SPANISH FOR MEDICAL PROFESSIONS II

**WGSS 414**  
SYSTEMS OF OPPRESSION IN WOMEN'S LIVES

### Upper-division Science Courses

Select two of the following: 6-8

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BB 331</td>
<td>*INTRODUCTION TO MOLECULAR BIOLOGY</td>
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</tr>
<tr>
<td>BB 332</td>
<td>*MOLECULAR MEDICINE</td>
<td></td>
</tr>
<tr>
<td>BB 360</td>
<td>INTRODUCTION TO NEUROSCIENCE</td>
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<tr>
<td>BB 460</td>
<td>ADVANCED CELL BIOLOGY</td>
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<tr>
<td>BB 485</td>
<td>APPLIED BIOINFORMATICS</td>
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<tr>
<td>BI 309</td>
<td>TEACHING PRACTICUM</td>
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<td>BI 409</td>
<td>ADVANCED TEACHING PRACTICUM</td>
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<td>ST 352</td>
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<td>Z 431</td>
<td>VERTEBRATE PHYSIOLOGY I</td>
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<td>Z 432</td>
<td>VERTEBRATE PHYSIOLOGY II</td>
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<td>Z 437</td>
<td>VERTEBRATE ENDOCRINOLOGY</td>
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<td>Z 438</td>
<td>BEHAVIORAL NEUROBIOLOGY</td>
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<tr>
<td>UD CH 300–CH 498</td>
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<tr>
<td>UD MB 400–MB 498</td>
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</table>

Remaining Bacc Core and/or electives to reach the 180 credit requirement 52-58

Total credits required for graduation 180

* Baccalaureate Core Course (BCC)
+ Writing Intensive Course (WIC)
++ BHS majors must complete CH 231, 232, 233, 261, 262, 263, and 331 with a C– or better
+++ BHS majors must complete BI 211, BI 212, and BI 213 with a C– or better

1 This requirement is automatically met if any BHS option is completed.

2 Not to include CH 331, CH 332, CH 334, CH 335, CH 336, CH 337 or CH 374.

3 Not to include MB 416.

No more than 3 credits may come from the following courses:

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BI 309</td>
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<td>CH 401</td>
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<td>CH 403</td>
<td>THESIS</td>
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<tr>
<td>CH 405</td>
<td>READING AND CONFERENCE</td>
<td>1-16</td>
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<tr>
<td>CH 406</td>
<td>PROJECTS</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 407</td>
<td>SEMINAR</td>
<td>1-16</td>
</tr>
<tr>
<td>CH 410</td>
<td>INTERNSHIP</td>
<td>1-16</td>
</tr>
<tr>
<td>MB 401</td>
<td>RESEARCH</td>
<td>1-16</td>
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<tr>
<td>MB 403</td>
<td>THESIS</td>
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<tr>
<td>MB 405</td>
<td>READING AND CONFERENCE</td>
<td>1-16</td>
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<tr>
<td>MB 406</td>
<td>SPECIAL PROJECTS</td>
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<tr>
<td>MB 407</td>
<td>SEMINAR</td>
<td>1-16</td>
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<tr>
<td>MB 410</td>
<td>OCCUPATIONAL INTERNSHIP</td>
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</table>

### Major Code: 606

**Course**  
**Title**  
**Hours**

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<tr>
<th>First Year</th>
<th>Fall</th>
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<tbody>
<tr>
<td>BHS 110</td>
<td>BIOHEALTH SCIENCES ORIENTATION</td>
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<tr>
<td>CH 231</td>
<td>GENERAL CHEMISTRY</td>
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<th>Second Year</th>
<th>Fall</th>
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<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>CH 331</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>PHAR 210</td>
<td>TERMINALOGY OF THE HEALTH SCIENCES</td>
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<td>PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
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<tbody>
<tr>
<td>BI 212</td>
<td>*PRINCIPLES OF BIOLOGY</td>
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<tr>
<td>CH 332</td>
<td>ORGANIC CHEMISTRY</td>
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<tr>
<td>H 225</td>
<td>*SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS</td>
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<tr>
<td>Writing II</td>
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<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
</tr>
<tr>
<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
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<tr>
<td>H 210</td>
<td>*INTRODUCTION TO THE HEALTH CARE SYSTEM</td>
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### Western Culture 3-4

### Third Year | Fall |  |
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<tbody>
<tr>
<td>BB 450</td>
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<td>PH 201</td>
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Select one of the following WIC courses: 3

| BHS 323 | *MICROBIAL INFLUENCES ON HUMAN HEALTH | |
| MB 385 | *EMERGING INFECTIOUS DISEASES AND EPIDEMICS | |

### Winter |  |
<table>
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<tr>
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<tbody>
<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
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<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
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<tr>
<td>PH 202</td>
<td>*GENERAL PHYSICS</td>
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### Cultural Diversity 3-4

### Spring |  |
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<tbody>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
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<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
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<tr>
<td>PH 203</td>
<td>*GENERAL PHYSICS</td>
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### Literature and the Arts 3-4
Pre-Clinical Laboratory Science Option

This option is offered within the following major(s):

- BioHealth Sciences - College of Science (p. 1025)

Clinical laboratory scientists (also known as medical laboratory scientists or medical technologists) perform routine and highly specialized diagnostic procedures in clinical laboratories. They must be certified by the American Society of Clinical Pathologists (ASCP) or the National Certification Agency (NCA). Certification requires 12 to 15 months of training at an accredited professional school of clinical laboratory science. Oregon currently has one such school jointly administered by the Oregon Health and Science University (OHSU) and Oregon Institute of Technology (OIT); Washington and California have several. Most clinical laboratory science schools require a bachelor of science degree for admission to their educational program; however, some schools (notably OHSU/OIT) accept students who have had three years of appropriate college work. Most pre-clinical laboratory science students complete the BS degree in BioHealth Sciences/Pre-CLS option before attending a clinical laboratory science program (4+1 program).

The BioHealth Sciences major combined with the Pre-Clinical Laboratory Science option is designed to meet most or all of the requirements for admission to CLS programs across the U.S. Satisfactory completion of the pre-CLS option facilitates, but does not guarantee, admission to a CLS program; applicants are selected on a competitive basis. Students are urged to carefully check admission requirements at their schools of interest and work closely with admission representatives in order to make sure they are meeting all current requirements.

Students may not combine the Pre-Clinical Laboratory Science option with any other option offered with the BioHealth Sciences major (Pre-Medicine/Pre-Podiatry, Pre-Pharmacy, Pre-Dentistry, Pre-Optometry, Pre-Physical Therapy, Pre-Physician Assistant).

Option Code: 576

Courses may be used to meet requirements for the BHS core and/or bacc core. For the Pre-Clinical Laboratory Sciences option, MB 416 will meet the BHS core requirement for an immunology course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>BI 331 &amp; BI 332</td>
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<td>&amp; BI 333</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
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<td>&amp; BI 341</td>
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<td>&amp; BI 342</td>
<td>LABORATORY</td>
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<td>&amp; BI 343</td>
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<tr>
<td>&amp; BI 343</td>
<td>and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY</td>
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<td>MB 416</td>
<td>IMMUNOLOGY</td>
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Select one of the following:

- MB 456 THE HUMAN MICROBIOME
- MB 480 GENERAL PARASITOLOGY
- H 425 FOUNDATIONS OF EPIDEMIOLOGY

Select one of the following:

- PSY 350 HUMAN LIFESPAN DEVELOPMENT
- PSY 381 ABNORMAL PSYCHOLOGY
- SOC 204 INTRODUCTION TO SOCIOLOGY

---

1 Not to include CH 331, CH 332, CH 334, CH 335, CH 336, CH 337 or CH 374.
2 Not to include MB 416.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)
Pre-Dentistry Option

This option is offered within the following major(s):

- BioHealth Sciences - College of Science (p. 1025)

The BioHealth Sciences major combined with the Pre-Dentistry option is designed to meet most or all of the requirements for admission to dentistry schools across the U.S. Satisfactory completion of the pre-dentistry option facilitates, but does not guarantee, admission to dental school; applicants are selected on a competitive basis. Students are typically selected on the basis of grades, DAT scores, dental experience, and apparent motivation for dentistry. Students are urged to carefully check admission requirements at their schools of interest and work closely with admission representatives in order to make sure they are meeting all current requirements. A member of the pre-dental committee is assigned to each student as an advisor to assist them in the process.

Students may not combine the Pre-Dentistry/BioHealth Sciences option with any other option offered with the BioHealth Sciences major (Pre-Medicine/Pre-Podiatry, Pre-Pharmacy, Pre-Clinical Laboratory Science, Pre-Optometry, Pre-Physical Therapy, Pre-Physician Assistant).

Option Code: 595

Courses may be used to meet requirements for the BHS core and/or bacc core. For the Pre-Dentistry option, MTH 251 and MTH 252 will meet the BHS core requirement for two MTH courses at MTH 111 or higher. ST 351, if chosen, will meet the BHS core requirement for a statistics course. BHS 323, if chosen, will meet the BHS core requirement for a Writing Intensive Course (WIC).

Graduation in BioHealth Sciences with the Pre-Dentistry option requires a total of 40 credits of upper-division courses in science.

Option Code: 775

Pre-Medicine/Pre-Podiatry Option

This option is offered within the following major(s):

- BioHealth Sciences - College of Science (p. 1025)

Physicians diagnose illness and injury, prescribe and administer treatment and advise patients about how to prevent and manage wellbeing. There are two traditional paths to becoming a doctor: allopathic medicine, which leads to Doctor of Medicine (MD), or osteopathic medicine, which leads to a Doctor of Osteopathy (DO). Both provide the education and training necessary to practice medicine. A podiatrist is a Doctor of Podiatric Medicine (DPM), trained specifically to diagnose and treat conditions of the foot, ankle, and related structures of the leg.

The BioHealth Sciences major combined with the Pre-Medicine/Pre-Podiatry option is designed to meet most or all of the requirements for admission to allopathic, osteopathic, or podiatric medical schools across the U.S. Satisfactory completion of the Pre-Medicine/Pre-Podiatry option facilitates, but does not guarantee, admission to any medical school. The BioHealth Sciences major is also suited for postbaccalaureate students who already have a bachelor’s degree in another subject and need science course work to apply to medical school.

The book, Medical School Admission Requirements, published by the Association of American Medical Colleges (https://www.aamc.org/), lists specific entrance requirements for allopathic (MD) schools. The American Association of Colleges of Osteopathic Medicine (http://www.aacom.org/) lists requirements for osteopathic (DO) schools. The American Association of College of Podiatric Medicine (http://www.aacpm.org/) lists requirements for podiatric (DPM) schools. Students are urged to carefully check admission requirements at their schools of interest and work closely with admission representatives in order to make sure they are meeting all requirements.

Admission to medical school is very competitive. Students are chosen according to grades, MCAT scores, medical experience, and apparent motivation for medicine. A member of the premedical committee is assigned to each student as an advisor.

Students may not combine the Pre-Medicine/Pre-Podiatry option with any other option offered with the BioHealth Sciences major (Pre-Physician Assistant, Pre-Pharmacy, Pre-Clinical Laboratory Science, Pre-Dentistry, Pre-Optometry, Pre-Physical Therapy).

Option Code: 775

Courses may be used to meet requirements for the BHS core and/or bacc core. For the Pre-Medicine/Pre-Podiatry option, MB 416 will meet the BHS core requirement for an immunology course, the combination of MTH 251/MTH 252 or MTH 227/MTH 228 will meet the BHS core requirement for two MTH courses, and ST 351 will meet the BHS core requirement for a statistics course. PHL 444, if chosen, will meet the bacc core requirement for a Science, Technology, and Society synthesis course. ANTH 383, if chosen, will meet the bacc core requirement for a Contemporary Global Issues synthesis course.
Pre-Optometry Option

This option is offered within the following major(s):
- BioHealth Sciences - College of Science (p. 1025)

The Pre-Optometry option is designed to meet most or all of the requirements for admission to optometry programs across the U.S. Satisfactory completion of the pre-optometry option facilitates, but does not guarantee, admission to an optometry program; applicants are selected on a competitive basis. Students are urged to carefully check admission requirements at their schools of interest and work closely with admission representatives in order to make sure they are meeting all current requirements.

Students may not combine the Pre-Optometry option with any other option offered with the BioHealth Sciences major (Pre-Medicine/Pre-Podiatry, Pre-Dentistry, Pre-Clinical Laboratory Science, Pre-Dentistry, Pre-Physical Therapy, Pre-Physician Assistant).

Option Code: 603

Courses may be used to meet requirements for the BHS core and/or bacc core. For the Pre-Optometry option, MTH 251 and MTH 252 meet the BHS core requirement of two MTH courses at MTH 111 or higher. ST 201 meets the BHS core requirement for a statistics course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 331</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
<tr>
<td>&amp; BI 332 &amp; BI 333 &amp; BI 333</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)

Option Code: 583

Courses may be used to meet requirements for the BHS core and/or bacc core. For the Pre-Pharmacy option, MTH 251 will meet the BHS core requirements for one MTH class at MTH 111 or higher.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 331</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
<tr>
<td>&amp; BI 332 &amp; BI 333 &amp; BI 333</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
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</table>

* Baccalaureate Core Course (BCC)

Option Code: 583

Courses may be used to meet requirements for the BHS core and/or bacc core. For the Pre-Pharmacy option, MTH 251 will meet the BHS core requirements for one MTH class at MTH 111 or higher.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 331</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
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<td>&amp; BI 332 &amp; BI 333 &amp; BI 333</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY</td>
<td>9</td>
</tr>
</tbody>
</table>

* Baccalaureate Core Course (BCC)

Option Code: 583
Pre-Physical Therapy Option

This option is offered within the following major(s):

- BioHealth Sciences - College of Science (p. 1025)

The BioHealth Sciences major combined with the Pre-Physical Therapy option is designed to meet most or all of the requirements for admission to PT programs across the U.S. Satisfactory completion of the pre-PT option facilitates, but does not guarantee, admission to a PT program; applicants are selected on a competitive basis. Students are urged to carefully check admission requirements at their schools of interest and work closely with admission representatives in order to make sure they are meeting all current requirements.

Students may not combine the Pre-Physical Therapy option with any other option offered with the BioHealth Sciences major (Pre-Medicine/Pre-Podiatry, Pre-Pharmacy, Pre-Clinical Laboratory Science, Pre-Dentistry, Pre-Optometry, Pre-Physician Assistant).

Option Code: 585

Courses may be used to meet requirements for the BHS core and/or bacc core.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 331 &amp; BI 332 &amp; BI 333</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY &amp; BI 333 &amp; BI 333 &amp; BI 333</td>
<td>9</td>
</tr>
<tr>
<td>BI 341 &amp; BI 342 &amp; BI 343</td>
<td>ADVANCED HUMAN ANATOMY AND PHYSIOLOGY &amp; BI 341 &amp; BI 342 &amp; BI 343</td>
<td>6</td>
</tr>
<tr>
<td>KIN 321</td>
<td>BIOMECHANICS OF HUMAN MOVEMENT</td>
<td>4</td>
</tr>
<tr>
<td>PSY 350 or PSY 381</td>
<td>HUMAN LIFESPAN DEVELOPMENT or PSY 381</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 23

Pre-Physician Assistant Option

This option is offered within the following major(s):

- BioHealth Sciences - College of Science (p. 1025)

The BioHealth Sciences major with the Pre-Physician Assistant option is designed to meet most or all of the requirements for admission to PA programs across the U.S. Satisfactory completion of the pre-PA option facilitates, but does not guarantee, admission to a PA program. Admission to physician assistant school is very competitive and student selection is based on grades, GRE scores, clinical experiences and more. Students are urged to carefully check admission requirements at their schools of interest and work closely with admission representatives in order to make sure they are meeting all requirements.

Students may not study the Pre-Physician Assistant option alongside any other option offered with the BioHealth Sciences major (Pre-Medicine/Pre-Podiatry, Pre-Pharmacy, Pre-Clinical Laboratory Science, Pre-Dentistry, Pre-Optometry, Pre-Physical Therapy).

Option Code: 597

Microbiology Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration

Environmental microbiology, food microbiology, genomics, immunology, microbial ecology, microbial evolution, parasitology, pathogenic microbiology, virology

Administered by the Department of Microbiology under the School of Life Sciences.

The Department of Microbiology offers graduate programs leading to the Master of Science (thesis and non-thesis), and Doctor of Philosophy degrees. Major fields of study are diverse and include basic and applied aspects of virology and bacteriology; pathogenic microbiology; environmental and applied microbiology, bioinformatics and microbial evolution. Students may minor in a variety of related disciplines in the life sciences, biological data sciences and biochemistry.

The principal objectives of the thesis-based M.S. and Ph.D. programs in Microbiology are the completion of a comprehensive research project and preparation of a thesis document. Coursework and research projects are developed with the major professor and are subject to approval by a committee of graduate faculty members. Microbiology research facilities are excellent and well-equipped. A non-thesis M.S. engages students through classroom and laboratory courses.

For more information, contact Jerri Bartholomew, Professor, Department of Microbiology, 226 Nash Hall, OSU, Corvallis OR 97331-3804 or email: jerri.bartholomew@oregonstate.edu.

Major Code: 5700
Students in the Microbiology Graduate Program are required to take the following core sequence of courses during their first year of enrollment in the program:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAD 520</td>
<td>RESPONSIBLE CONDUCT OF RESEARCH</td>
<td>2</td>
</tr>
<tr>
<td>MB 511</td>
<td>SCIENTIFIC SKILLS</td>
<td>1</td>
</tr>
<tr>
<td>MB 512</td>
<td>HIGHLIGHTS OF MICROBIOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>MB 513</td>
<td>MICROBIAL SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Major Code: 5700

Microbiology Graduate Minor

Administered by the Department of Microbiology under the School of Life Sciences.

Minor Code: 5700

Microbiology Minor

Also available via Ecampus.

Administered by the Department of Microbiology (https://catalog.oregonstate.edu/college-departments/science/school-life-sciences/microbiology/) under the School of Life Sciences.

The Microbiology minor is designed for students from other majors who have an additional interest in the field of microbiology. Student majoring in Biology (BI) or BioHealth Sciences (BHS) cannot declare the Microbiology minor. The courses used for the MB minor may be shared with other majors, options, and minors.

Minor Code: 570

Some of the courses required for the Microbiology minor have additional prerequisites or grade requirements that are separate from the MB minor. At a minimum students will need to take BI 204, BI 205, BI 206 or BI 211, BI 212, BI 213.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHS 255/MB 255</td>
<td>ALLIED HEALTH MICROBIOLOGY</td>
<td>4-5</td>
</tr>
<tr>
<td>or MB 230</td>
<td>INTRODUCTORY MICROBIOLOGY</td>
<td></td>
</tr>
<tr>
<td>or MB 302 &amp; MB 303</td>
<td>GENERAL MICROBIOLOGY and GENERAL MICROBIOLOGY LABORATORY</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>Select 23 credits from the courses in Category I and Category II. No more than 9 credits can come from Category II.</td>
<td>23</td>
</tr>
</tbody>
</table>

Category I Electives

Select 14-23 credits from the following courses:

- BHS 316 PRINCIPLES OF IMMUNOLOGY
- BHS 320/MB 320 HUMAN BACTERIOLOGY
- BHS 322 *MICROBIAL INFLUENCES ON HUMAN HEALTH
- BHS 329 MECHANISM OF DISEASE: INTRODUCTION TO GENERAL PATHOLOGY
- BHS 340/MB 340 HUMAN VIROLOGY
- BOT 350 INTRODUCTORY PLANT PATHOLOGY
- BOT 461 MYCOLOGY
- MB 385 *EMERGING INFECTIOUS DISEASES AND EPIDEMICS
- MB 310 BACTERIAL MOLECULAR GENETICS

Minor Code: 570

Microbiology Undergraduate Major (BS, HBS)

Administered by the Department of Microbiology under the School of Life Sciences.

The undergraduate BS degree in Microbiology (MB) is designed for students seeking a focused education in the field of microbiology. The major consists of a comprehensive core with a strong biological and physical science foundation combined with select fundamental courses in microbiology, followed by the completion of a number of upper division microbiology courses selected by each student based on their specific...
interests. The Microbiology major integrates a number of laboratory classes, providing students with a wide variety of hands-on experiences. Students can also choose to do microbiology research in a number of laboratories on campus. Microbiology majors receive excellent training for a variety of professional programs, such as medical, dental, and pharmacy programs, as well as graduate school.

The Microbiology major has a built-in Chemistry minor. Students may also elect to complete one transcript-visible option in Pre-Medicine or Aquatic Microbiology. An option is not required. Options in the MB major require additional credits beyond the basic MB major, although most students can complete the MB degree requirements plus the additional course work for either option in four years. The Pre-Medicine option will help prepare a student for taking the standardized test required for medical school application (MCAT), as well as provide an additional perspective in the humanities that is valued by medical programs. The Aquatic Microbiology option takes advantage of an area of expertise by various researchers at OSU, exposing students to both fundamental concepts as well as unique perspectives related to microbiology in both freshwater and ocean systems.

**Major Code: 570**

To receive the BS degree in Microbiology, a student must complete all university baccalaureate core requirements plus departmental requirements listed below. All departmental requirements must be taken for a grade, with the exception of CH 324, which may be taken S/U, however, if taken S/U the student will not receive the chemistry minor.

Microbiology majors planning advanced professional training in medicine, dentistry, pharmacy, etc should consult an appropriate advisor.

**Code** | **Title** | **Hours**
--- | --- | ---
**Mathematics and Statistics Core (12 credits)**
MTH 227 & MTH 228 | CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I and II | 8
or MTH 251 & MTH 252 | *Differential Calculus and Integral Calculus | 5
ST 351 | INTRODUCTION TO STATISTICAL METHODS | 4
**Chemistry and Physics Core (46 credits)**
CH 231 & CH 261 | GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231 | 5
CH 232 & CH 262 | GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232 | 5
CH 233 & CH 263 | GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233 | 5
CH 324 | QUANTITATIVE ANALYSIS | 4
CH 331 & CH 332 | ORGANIC CHEMISTRY and ORGANIC CHEMISTRY | 8
CH 337 | ORGANIC CHEMISTRY LABORATORY | 4
PH 201 & PH 202 | *GENERAL PHYSICS and *GENERAL PHYSICS | 15
& PH 203 | *GENERAL PHYSICS | 5
**Biological Sciences Core (23 credits)**
BB 314 | CELL AND MOLECULAR BIOLOGY | 4
BB 450 & BB 451 | GENERAL BIOCHEMISTRY and GENERAL BIOCHEMISTRY | 7
BI 211 & BI 212 | *PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY | 12
& BI 213 | *PRINCIPLES OF BIOLOGY | 5
**Microbiological Sciences Core (18 credits)**
MB 110 | ORIENTATION TO MICROBIOLOGY | 1
MB 290 | SUCCESS IN MICROBIOLOGY | 1
MB 302 | GENERAL MICROBIOLOGY | 3
MB 303 | GENERAL MICROBIOLOGY LABORATORY | 2
MB 310 | BACTERIAL MOLECULAR GENETICS | 3
MB 311 | *MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE | 3
MB 312 | BACTERIAL PHYSIOLOGY AND METABOLISM | 3
MB 490 | MICROBIOLOGY CAPSTONE EXPERIENCE | 2
**Upper-division Microbiology Laboratory (2 credits)**
Select one of the upper division MB labs from the following:
MB 417 | IMMUNOLOGY LABORATORY | 2
MB 422 | AQUATIC MICROBIOLOGY LABORATORY | 3
MB 435 | PATHOGENIC MICROBES LABORATORY | 3
MB 441 | FOOD MICROBIOLOGY LABORATORY | 3
MB 461 | FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB | 3
**Upper-division Microbiology Electives (18 credits)**
Select 18 credits from the following:
BOT 350 | INTRODUCTORY PLANT PATHOLOGY | 18
BOT 461 | MYCOLOGY | 3
MB 401 | RESEARCH | 3
MB 403 | THESIS | 3
MB 405 | READING AND CONFERENCE | 3
MB 406 | SPECIAL PROJECTS | 3
MB 410 | OCCUPATIONAL INTERNSHIP | 3
MB 416 | IMMUNOLOGY | 3
MB 417 | IMMUNOLOGY LABORATORY | 3
MB 420 | MICROBIAL GENOMES, BIOGEOCHEMISTRY, AND DIVERSITY | 3
MB 422 | AQUATIC MICROBIOLOGY LABORATORY | 3
MB 430 | BACTERIAL PATHOGENESIS | 3
MB 434 | VIROLOGY | 3
MB 435 | PATHOGENIC MICROBES LABORATORY | 3
MB 436 | THE HUMAN MICROBIOME | 3
MB 440 | FOOD MICROBIOLOGY | 3
MB 441 | FOOD MICROBIOLOGY LABORATORY | 3
MB 448 | MICROBIAL ECOLOGY | 3
MB 456 | MICROBIAL GENETICS AND BIOTECHNOLOGY | 3
MB 479/FST 479 | FERMENTATION BIOCHEMISTRY | 3
MB 480 | GENERAL PARASITOLOGY | 3
MB 491/FST 491 | FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE | 3
MB 496 | FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB | 3
MB 499 | SPECIAL TOPICS | 3

Remaining Bacc Core and/or electives to reach the 180 credit requirement | 180

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
+ MB majors must complete the following courses with a grade of C- or better: MTH 227 (or MTH 251), CH 231, CH 232, CH 233, CH 261, CH 262, CH 263 and CH 331
** MB majors must have a minimum 2.0 GPA in microbiology classes. This includes courses in the Microbiology Sciences Core, Microbiology Laboratory, and Microbiology Electives
1 Additional upper division MB lab credits may count towards the Upper-division Microbiology Electives credits
2 No more than 3 credits may come from the following courses: MB 401, MB 403, MB 405, MB 410. No more than 3 credits may come from MB 406

**Major Code: 570**
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 211</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>12</td>
</tr>
<tr>
<td>BI 212 &amp; BI 213</td>
<td>*PRINCIPLES OF BIOLOGY</td>
<td>5</td>
</tr>
<tr>
<td>CH 231 &amp; CH 261</td>
<td>GENERAL CHEMISTRY &amp; *LABORATORY FOR CHEMISTRY 231</td>
<td>5</td>
</tr>
<tr>
<td>CH 232 &amp; CH 262</td>
<td>GENERAL CHEMISTRY &amp; *LABORATORY FOR CHEMISTRY 232</td>
<td>5</td>
</tr>
<tr>
<td>CH 233 &amp; CH 263</td>
<td>GENERAL CHEMISTRY &amp; *LABORATORY FOR CHEMISTRY 233</td>
<td>5</td>
</tr>
<tr>
<td>MB 110</td>
<td>ORIENTATION TO MICROBIOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>MTH 251 or MTH 227</td>
<td>*DIFFERENTIAL CALCULUS or *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 252 or MTH 228</td>
<td>INTEGRAL CALCULUS or CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II</td>
<td>4</td>
</tr>
<tr>
<td>Fitness</td>
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<td>3</td>
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<tr>
<td>Speech</td>
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<td>3</td>
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<tr>
<td>Writing I</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>45</td>
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<tr>
<td>Second Year</td>
<td></td>
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<tr>
<td>BB 314</td>
<td>CELL AND MOLECULAR BIOLOGY</td>
<td>4</td>
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<tr>
<td>CH 331 &amp; CH 332</td>
<td>ORGANIC CHEMISTRY &amp; ORGANIC CHEMISTRY</td>
<td>8</td>
</tr>
<tr>
<td>CH 337</td>
<td>ORGANIC CHEMISTRY LABORATORY</td>
<td>4</td>
</tr>
<tr>
<td>MB 302</td>
<td>GENERAL MICROBIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MB 303</td>
<td>GENERAL MICROBIOLOGY LABORATORY</td>
<td>2</td>
</tr>
<tr>
<td>PH 201 &amp; PH 202 &amp; PH 203</td>
<td>*GENERAL PHYSICS and *GENERAL PHYSICS and *GENERAL PHYSICS</td>
<td>15</td>
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<tr>
<td>ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
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<tr>
<td>Electives</td>
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<td>3</td>
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<tr>
<td>Writing II</td>
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<td>3</td>
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<tr>
<td></td>
<td>Hours</td>
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<td>Third Year</td>
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<td>BB 450</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>4</td>
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<tr>
<td>BB 451</td>
<td>GENERAL BIOCHEMISTRY</td>
<td>3</td>
</tr>
<tr>
<td>CH 324</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>MB 310</td>
<td>BACTERIAL MOLECULAR GENETICS</td>
<td>3</td>
</tr>
<tr>
<td>MB 311</td>
<td>*MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE</td>
<td>3</td>
</tr>
<tr>
<td>MB 312</td>
<td>BACTERIAL PHYSIOLOGY AND METABOLISM</td>
<td>3</td>
</tr>
<tr>
<td>Perspectives</td>
<td></td>
<td>15</td>
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<td>Synthesis</td>
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<td>Elective</td>
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<td>3</td>
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<tr>
<td></td>
<td>Hours</td>
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<tr>
<td>Fourth Year</td>
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<tr>
<td>MB 490</td>
<td>MICROBIOLOGY CAPSTONE EXPERIENCE</td>
<td>2</td>
</tr>
<tr>
<td>Select 20 credits from the approved 400-level microbiology courses below</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>BOT 350</td>
<td>INTRODUCTORY PLANT PATHOLOGY</td>
<td></td>
</tr>
<tr>
<td>BOT 461</td>
<td>MYCOLOGY</td>
<td></td>
</tr>
<tr>
<td>MB 401</td>
<td>RESEARCH</td>
<td></td>
</tr>
<tr>
<td>MB 405</td>
<td>READING AND CONFERENCE</td>
<td></td>
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<tr>
<td>MB 406</td>
<td>SPECIAL PROJECTS</td>
<td></td>
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<tr>
<td>MB 410</td>
<td>OCCUPATIONAL INTERNSHIP</td>
<td></td>
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<tr>
<td>MB 416</td>
<td>IMMUNOLOGY</td>
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<tr>
<td>MB 417</td>
<td>IMMUNOLOGY LABORATORY</td>
<td></td>
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<tr>
<td>MB 420</td>
<td>MICROBIAL GENOMES, BIODEGEOCHEMISTRY, AND DIVERSITY</td>
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<td>MB 422</td>
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<td>MB 430</td>
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<td>MB 434</td>
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<td>MB 435</td>
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<td>MB 436</td>
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<td>MB 440</td>
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<td>MB 448</td>
<td>MICROBIAL ECOLOGY</td>
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<td>MB 456</td>
<td>MICROBIAL GENETICS AND BIOTECHNOLOGY</td>
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<td>MB 479/FST 479</td>
<td>FERMENTATION MICROBIOLOGY</td>
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<td>MB 491/FW 491</td>
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<td>MB 496</td>
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<td>MB 499</td>
<td>SPECIAL TOPICS</td>
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<td>MB 420</td>
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<td>MB 448</td>
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<tr>
<td>BI 351</td>
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<tr>
<td>BI 373</td>
<td>*FIELD METHODS IN MARINE ECOLOGY</td>
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<tr>
<td>BI 450</td>
<td>*MARINE BIOLOGY AND ECOLOGY</td>
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<tr>
<td>BI 495</td>
<td>DISEASE ECOLOGY</td>
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<tr>
<td>BOT 416</td>
<td>AQUATICBOTANY</td>
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<tr>
<td>BOT 476</td>
<td>INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES</td>
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<tr>
<td>BOT 480</td>
<td>PHOTOSYNTHESIS AND PHOTOBIOLOGY</td>
<td></td>
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<tr>
<td>FW 434</td>
<td>ESTUARINE ECOLOGY</td>
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<tr>
<td>or OC 434</td>
<td>ESTUARINE ECOLOGY</td>
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<tr>
<td>FW 456</td>
<td>FRESHWATER ECOLOGY AND CONSERVATION</td>
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<tr>
<td>FW 464</td>
<td>MARINE CONSERVATION BIOLOGY</td>
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<tr>
<td>MB 491/FW 491</td>
<td>FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE</td>
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</table>

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

**Aquatic Microbiology Option**

This option is offered within the following major(s):

- Microbiology - College of Science (p. 1031)

The Aquatic Microbiology option encompasses a core of oceanography and microbiology courses heavy in coverage of aquatic systems, combined with a selection of elective courses offered by various departments. The option is designed to provide a microbiology major with a detailed understanding of the role that microbes play in aquatic systems and for aquatic organisms, as well as an understanding of aquatic systems in general. The option complements the Marine Studies Initiative, which should stimulate interest in aquatic systems by students across campus.

**Option Code: 736**

Courses used to satisfy the Aquatic Microbiology option requirements may also satisfy the Upper-Division Microbiology Electives and Upper-Division Microbiology laboratory requirements in the Microbiology major.

**Code | Title | Hours**
---|---|---
MB 314 | AQUATIC MICROBIOLOGY | 3
MB 420 | MICROBIAL GENOMES, BIODEGEOCHEMISTRY, AND DIVERSITY | 3
MB 448 | MICROBIAL ECOLOGY | 3
OC 201 | *OCEANOGRAPHY | 4
Select 8 credits of the following:

**Code | Title | Hours**
---|---|---
BI 351 | MARINE ECOLOGY | 
BI 373 | *FIELD METHODS IN MARINE ECOLOGY | 
BI 450 | *MARINE BIOLOGY AND ECOLOGY | 
BI 495 | DISEASE ECOLOGY | 
BOT 416 | AQUATICBOTANY | 
BOT 476 | INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES | 
BOT 480 | PHOTOSYNTHESIS AND PHOTOBIOLOGY | 
FW 434 | ESTUARINE ECOLOGY | 
or OC 434 | ESTUARINE ECOLOGY | 
FW 456 | FRESHWATER ECOLOGY AND CONSERVATION | 
FW 464 | MARINE CONSERVATION BIOLOGY | 
MB 491/FW 491 | FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE | 

**Aquatic Microbiology Option**

This option is offered within the following major(s):

- Microbiology - College of Science (p. 1031)

The Aquatic Microbiology option encompasses a core of oceanography and microbiology courses heavy in coverage of aquatic systems, combined with a selection of elective courses offered by various departments. The option is designed to provide a microbiology major with a detailed understanding of the role that microbes play in aquatic systems and for aquatic organisms, as well as an understanding of aquatic systems in general. The option complements the Marine Studies Initiative, which should stimulate interest in aquatic systems by students across campus.

**Option Code: 736**

Courses used to satisfy the Aquatic Microbiology option requirements may also satisfy the Upper-Division Microbiology Electives and Upper-Division Microbiology laboratory requirements in the Microbiology major.
Pre-Medicine/Microbiology Option

This option is offered within the following major(s):

- Microbiology - College of Science (p. 1031)

The Pre-Medicine/Microbiology option for the Microbiology major is designed to meet the current requirements for application to most medical schools in the U.S. (although students are advised to consult the requirements for specific schools before they apply, in the case of changes). Students pursuing a Microbiology degree receive a broad education in microbiological topics. The option focuses some of that education at the 400-level to ensure that students pursuing medicine take microbiology courses of interest to the medical field. In addition, the option adds important social science requirements and medical humanities electives that are not part of the general microbiology degree, but that are important for students pursuing a degree in medicine.

Option Code: 607

Courses used to satisfy the Pre-Medicine option requirements may also satisfy the Upper-Division Microbiology Electives and Upper-Division Microbiology laboratory requirements in the Microbiology major. Courses may also be used to satisfy areas of the baccalaureate core.

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<tr>
<th>Code</th>
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<td>*GENERAL PSYCHOLOGY</td>
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<td>PSY 202</td>
<td>*GENERAL PSYCHOLOGY</td>
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<td>BACTERIAL PATHOGENESIS</td>
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<td>MB 434</td>
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<td>MB 417</td>
<td>IMMUNOLOGY LABORATORY</td>
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<td>MB 435</td>
<td>PATHOGENIC MICROBES LABORATORY</td>
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<td>ANTH 383</td>
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<td>BI 420</td>
<td>*VIRUSES IN MODERN SOCIETY</td>
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<td>H 312</td>
<td>*HIV/AIDS AND STIS IN MODERN SOCIETY</td>
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<td>H 320</td>
<td>INTRODUCTION TO HUMAN DISEASE</td>
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<td>H 425</td>
<td>FOUNDATIONS OF EPIDEMIOLOGY</td>
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<td>HSTS 417</td>
<td>**HISTORY OF MEDICINE</td>
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<td>PHL 444</td>
<td>*BIOMEDICAL ETHICS</td>
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<td>SOC 350</td>
<td>HEALTH, ILLNESS AND SOCIETY</td>
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<td>ST 352</td>
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<td>Z 431</td>
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Statistics

The Department of Statistics offers undergraduate service courses and an undergraduate minor, as well as graduate courses and programs leading to the MA, MS, and PhD degrees or to a minor for an advanced degree in other fields. Students planning to major in statistics at the graduate level should have a minimum of mathematics through multivariable calculus, linear algebra, and an upper-division sequence in mathematical statistics.

Survey Research Center

Established in 1973, the Oregon State University Survey Research Center (http://stat.oregonstate.edu/src/survey-research-center/) (OSU-SRC) provides comprehensive survey services including proposal development, questionnaire design and layout, survey administration and data collection, survey analysis and professional report writing. Our staff offers customized options, working with our clients to determine the best approach to collect survey data based on the study objectives, population of interest, and budgetary concerns. Our past and current clients include federal, state, and local agencies, national non-profit organizations, and OSU-affiliated entities. The OSU-SRC maintains several contracts with clients to provide our services on a recurrent basis, from monthly, annually, to ever few years.

Operating as a center for research in survey methodology, the OSU-SRC routinely conducts experiments using self-administered surveys with an aim to contribute to survey methodology research. The OSU-SRC subsequently publishes related material in scientific journals and presents experimental findings at professional meetings. The OSU-SRC provides expertise using survey best practices to maximize response rates and reduce non-response bias. Various sampling plans are examined for each survey to minimize total survey error. The OSU-SRC also offers consulting for OSU community members on research-based survey design and analysis.

Undergraduate Programs

Minor
- Statistics (p. 1040)

Graduate Programs

Majors
- Data Analytics (p. 1039)
- Statistics (p. 1039)

Minor
- Statistics (p. 1040)

Certificate
- Data Analytics (p. 1039)

Virginia M. Lesser, Chair
239 Weniger Hall
ST 352. INTRODUCTION TO STATISTICAL METHODS. (4 Credits)
Randomization tests and other nonparametric tests for one- and two-sample inference, simple and multiple linear regression, correlation, one- and two-way analysis of variance, logistic regression. Lec/lab.
Prerequisites: ST 351 with D- or better or ST 351H with D- or better

ST 406. PROJECTS. (1-16 Credits)
Section 1: Projects, graded P/N. Section 2: Teaching Experience, graded P/N. Section 3: Directed Work, graded P/N.
This course is repeatable for 16 credits.

ST 407. SEMINAR. (1 Credit)
Attendance at consulting practicum. Graded P/N.

ST 410. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ST 411. METHODS OF DATA ANALYSIS. (4 Credits)
Graphical, parametric and nonparametric methods for comparing two samples; one-way and two-way analysis of variance; simple linear regression. Lec/lab.
Recommended: ST 351

ST 412. METHODS OF DATA ANALYSIS. (4 Credits)
Multiple linear regression, including model checking, dummy variables, using regression to fit analysis of variance models, analysis of covariance, variable selection methods. Lec/lab.
Prerequisites: ST 411 with D- or better
Recommended: ST 351

ST 413. METHODS OF DATA ANALYSIS. (4 Credits)
Principles of experimental design; randomized block and factorial designs; repeated measures; categorical data analysis, including comparison of proportions, tests of homogeneity and independence in cross-classified frequency tables, Mantel-Haenszel test, logistic regression, log-linear regression. Introduction to multivariate statistics. Lec/lab.
Prerequisites: ST 412 with D- or better
Recommended: ST 351

ST 415. DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS. (3 Credits)
Principles of experimental design; uses, construction and analysis of completely randomized, randomized block and Latin square designs; covariates; factorial treatments, split-plotting; random effects and variance components.
Prerequisites: ST 352 with D- or better or ST 411 with D- or better or ST 511 with D- or better

ST 421. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Probability, random variables, expectation, discrete and continuous distributions, multivariate distributions.
Recommended: MTH 253

ST 422. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Sampling distributions, Central Limit Theorem, estimation, confidence intervals, properties of estimators, and hypothesis testing.
Prerequisites: ST 421 with D- or better
Recommended: MTH 253

ST 431. SAMPLING METHODS. (3 Credits)
Estimation of means, totals and proportions; sampling designs including simple random, stratified, cluster, systematic, multistage and double sampling; ratio and regression estimators; sources of error in surveys; capture-recapture methods.
Recommended: ST 411 or ST 511
ST 435. QUANTITATIVE ECOLOGY. (3 Credits)
Overview of statistical methods that are useful for analyzing ecological data, including spatial pattern analysis, multivariate techniques, logistic regression, Bayesian statistics and computer-intensive methods. Consideration of special topics such as population dynamics, food webs and ecological indicators. Not offered every year.
Prerequisites: ST 412 with D- or better or ST 512 with D- or better

ST 439. SURVEY METHODS. (3 Credits)
Survey design, data collection and analysis, general methodology.
Prerequisites: ST 201 with D- or better or ST 351 with D- or better

ST 441. PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS. (4 Credits)
Prerequisites: ST 422 with D- or better or ST 522 with D- or better

ST 443. APPLIED STOCHASTIC MODELS. (3 Credits)
Development of stochastic models commonly arising in statistics and operations research, such as Poisson processes, birth-and-death processes, discrete-time and continuous-time Markov chains, renewal and Markov renewal processes. Analysis of stochastic models by simulation and other computational techniques.
Prerequisites: ST 421 with D- or better or ST 521 with D- or better
Recommended: Experience with a high-level programming language or mathematical computation package

ST 499. SPECIAL TOPICS. (1-4 Credits)
May be repeated for credit.
This course is repeatable for 4 credits.

ST 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ST 503. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

ST 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ST 506. PROJECTS. (1-16 Credits)
Section 1: Projects. Section 2: Teaching Experience. Section 3: Directed Work.
This course is repeatable for 16 credits.

ST 507. SEMINAR. (1 Credit)
Section 1: Attendance at consulting practicum, 1 credit. Section 3: Research Seminar, 1 credit. Section 4: Computing Facilities, 1 credit. All sections graded P/N.
This course is repeatable for 99 credits.

ST 509. CONSULTING PRACTICUM. (2 Credits)
The student provides statistical advice, under faculty guidance, on university-related research projects.
This course is repeatable for 99 credits.
Recommended: ST 507 and ST 553

ST 510. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ST 511. METHODS OF DATA ANALYSIS. (4 Credits)
Graphical, parametric and nonparametric methods for comparing two samples; one-way and two-way analysis of variance; simple linear regression. Lec/lab.
Recommended: ST 351

ST 512. METHODS OF DATA ANALYSIS. (4 Credits)
Multiple linear regression, including model checking, dummy variables, using regression to fit analysis of variance models, analysis of covariance, variable selection methods. Lec/lab.
Prerequisites: ST 511 with C or better
Recommended: ST 351

ST 513. METHODS OF DATA ANALYSIS. (4 Credits)
Principles of experimental design; randomized block and factorial designs; repeated measures; categorical data analysis, including comparison of proportions, tests of homogeneity and independence in cross-classified frequency tables, Mantel-Haenszel test, logistic regression, log-linear regression. Introduction to multivariate statistics. Lec/lab.
Prerequisites: ST 512 with C or better
Recommended: ST 351

ST 514. METHODS OF DATA ANALYSIS. (4 Credits)
Inspection of residuals; assessment of model fit; graphical methods; model checking; estimation and prediction with one- and two-sample problems; categorical data analysis, including logistic regression, log-linear regression. Introduction to multivariate statistics. Lec/lab.
Recommended: ST 511 or ST 512

ST 515. DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS. (3 Credits)
Principles of experimental design; uses, construction and analysis of completely randomized, randomized block and Latin square designs; covariates; factorial treatments, split-ploting; random effects and variance components.
Recommended: ST 352 or (ST 411 or ST 511)

ST 516. FOUNDATIONS OF DATA ANALYTICS. (4 Credits)
Foundations of estimation and hypothesis testing; desirable properties of estimators; maximum likelihood; one- and two-sample problems; theoretical results are explored through simulations and analysis using R. Offered via Ecampus only.
Recommended: ST 351

ST 517. DATA ANALYTICS I. (4 Credits)
Methods for modeling quantitative data and statistical learning—simple and multiple linear regression; linear mixed effects models; data imputation; prediction and cross-validation; scaling up to large datasets. Simulations and data analysis using R. Offered via Ecampus only.
Prerequisites: ST 516 with C+ or better

ST 518. DATA ANALYTICS II. (4 Credits)
Statistical methods and data analysis techniques for count data. Topics include tests for tables of counts, logistic regression, log-linear regression, generalized linear mixed models, and issues for large datasets. Data analysis in R.
Prerequisites: ST 517 with C+ or better

ST 521. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Probability, random variables, expectation, discrete and continuous distributions, multivariate distributions.
Recommended: MTH 253

ST 522. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Sampling distributions, Central Limit Theorem, estimation, confidence intervals, properties of estimators, and hypothesis testing.
Prerequisites: ST 521 with C or better
Recommended: MTH 253
ST 525. APPLIED SURVIVAL ANALYSIS. (3 Credits)
Statistical methods for analyzing survival data or time-to-event data, which may be censored and/or truncated. Specific topics can vary term to term, and could include Kaplan-Meier estimator; K-sample hypothesis tests for survival data; Accelerated failure time model; Cox proportional hazard regression model.
Prerequisites: ST 516 with C or better and ST 517 [C] and ST 518 [C]

ST 531. SAMPLING METHODS. (3 Credits)
Estimation of means, totals and proportions; sampling designs including simple random, stratified, cluster, systematic, multistage and double sampling; ratio and regression estimators; sources of errors in surveys; capture-recapture methods.
Recommended: ST 411 or ST 511

ST 535. QUANTITATIVE ECOLOGY. (3 Credits)
Overview of statistical methods that are useful for analyzing ecological data, including spatial pattern analysis, multivariate techniques, logistic regression, Bayesian statistics and computer-intensive methods. Consideration of special topics such as population dynamics, food webs and ecological indicators. Not offered every year.
Recommended: ST 412 or ST 512

ST 536. DATA VISUALIZATION. (3 Credits)
Perceptual principles for displaying data; critique and improvement of data visualizations; use of color in visualization; principles of tidy data; strategies for data exploration; select special topics.
Prerequisites: ST 512 with C or better or ST 517 with C or better or ST 552 with C or better
Recommended: Familiarity with linear regression and using R

ST 538. MODERN STATISTICAL METHODS FOR LARGE AND COMPLEX DATA SETS. (3 Credits)
Provides students with the tools and experience to analyze big and messy data and work effectively in a data science team. Covers the tools to handle big data and answer statistical questions based on the data. Includes three big data analysis projects that students work on in groups. Focuses on proper use of modern data analysis techniques related to regression, classification and clustering for data coming from a variety of application fields. R will be the lingua franca.
Prerequisites: ST 512 with C or better or ST 517 with C or better or ST 552 with C or better or ST 412 with C or better

ST 539. SURVEY METHODS. (3 Credits)
Survey design, data collection and analysis, general methodology.
Recommended: ST 201 or ST 351

ST 541. PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS. (4 Credits)
Recommended: ST 422 or ST 522

ST 543. APPLIED STOCHASTIC MODELS. (3 Credits)
Development of stochastic models commonly arising in statistics and operations research, such as Poisson processes, birth-and-death processes, discrete-time and continuous-time Markov chains, renewal and Markov renewal processes. Analysis of stochastic models by simulation and other computational techniques.
Recommended: (ST 421 or ST 521) and experience with a high-level programming language or mathematical computation package.

ST 551. STATISTICAL METHODS. (4 Credits)
Properties of $t$, chi-square and F tests; randomized experiments; sampling distributions and standard errors of estimators, delta method, comparison of several groups of measurements; two-way tables of measurements.
Recommended: Concurrent enrollment in MTH 341 and (ST 422 or ST 522)

ST 552. STATISTICAL METHODS. (4 Credits)
Simple and multiple linear regression including polynomial regression, indicator variables, weighted regression, and influence statistics, nonliner regression and linear models for binary data.
Prerequisites: ST 551 with C or better
Recommended: ST 422 or ST 522.

ST 553. STATISTICAL METHODS. (4 Credits)
Principles and analysis of designed experiments, including factorial experiments, analysis of covariance, random and mixed effect models. Lec/lab.
Prerequisites: ST 552 with C or better

ST 555. ADVANCED EXPERIMENTAL DESIGN. (3 Credits)
Designs leading to mixed models including split plots, repeated measures, crossovers and incomplete blocks. Introduction to experimental design in industry including confounding, fractional factorials and response surface methodology. Analysis of unbalanced data.
Prerequisites: ST 553 with C or better

ST 557. APPLIED MULTIVARIATE ANALYSIS. (3 Credits)
Multivariate data structures, linear combinations; principal components, factor and latent structure analysis, canonical correlations, discriminant analysis; cluster analysis, multidimensional scaling. Not offered every year.
Recommended: (ST 412 or ST 512) and (MTH 252 or MTH 245)

ST 558. MULTIVARIATE ANALYTICS. (3 Credits)
Basics of matrix algebra, principal components analysis, cluster analysis, factor analysis, multidimensional scaling.
Prerequisites: ST 518 with C- or better

ST 559. BAYESIAN STATISTICS. (3 Credits)
Bayesian statistics for data analysis. Characterizations of probability; comparative (Bayesian versus frequentist) inference; prior, posterior and predictive distributions; hierarchical modeling. Computational methods include Markov Chain Monte Carlo for posterior simulation.
Recommended: ST 562

ST 561. THEORY OF STATISTICS. (4 Credits)
Distributions of functions of random variables, joint and conditional distributions, sampling distributions, convergence concepts, order statistics. Lec/rec.
Recommended: ST 422 or ST 522

ST 562. THEORY OF STATISTICS. (4 Credits)
Sufficiency, exponential families, location and scale families; point estimation: maximum likelihood, Bayes, and unbiased estimators; asymptotic distributions of maximum likelihood estimators; Taylor series approximations.
Prerequisites: ST 561 with C or better
Recommended: ST 422 or ST 522
ST 563. THEORY OF STATISTICS. (4 Credits)
Hypothesis testing: likelihood ratio, Bayesian, and uniformly most powerful tests; similar tests in exponential families; asymptotic distributions of likelihood ratio test statistics; confidence intervals.
Prerequisites: ST 562 with C or better
This course is repeatable for 4 credits.
Recommended: ST 422 or ST 522

ST 565. TIME SERIES. (3 Credits)
Analysis of serially correlated data in both time and frequency domains. Autocorrelation and partial autocorrelation functions, autoregressive integrated moving average models, model building, forecasting; filtering, smoothing, spectral analysis, frequency response studies, Offered winter term in even years.
Recommended: (ST 412 or ST 512) and (ST 422 or ST 522)

ST 566. TIME SERIES ANALYSES. (3 Credits)
Focuses on statistical and analytical tools for analyzing data that are observed sequentially over time. Specific topics can vary term to term, and could include methods for exploratory time series analysis, linear time series models (ARMA, ARIMA), forecasting, spectral analysis and state-space models. The focus will be on applied problems, though some mathematical statistics is necessary for a solid understanding of the statistical issues. This course is designed for students in Data Analytics MS and Certificate programs.
Prerequisites: ST 516 with C or better and ST 517 [C] and ST 518 [C]

ST 567. SPATIAL STATISTICS. (3 Credits)
The analysis of spatial data. Graphical tools for exploring spatial data, geostatistics, variogram estimation, kriging, areal models, hierarchical spatial models, and spatio-temporal modelling. Offered winter term in odd years.
Recommended: (ST 412 or ST 512) and (ST 422 or ST 522)

ST 591. INTRODUCTION TO QUANTITATIVE GENOMICS. (3 Credits)
Provides an overview of how genomic data is generated and analyzed. It focuses on the underlying biological motivation, theoretical concepts, and analytical challenges associated with genomic research, especially the generation of statistics that summarize genomic data. The class is organized as a combination of lectures and group literature review discussions. Students are expected to actively participate in the class. Students from diverse backgrounds, including quantitative, biological, and computations sciences, are encouraged to enroll.
Recommended: ST 411 or ST 511

ST 592. STATISTICAL METHODS FOR GENOMICS RESEARCH. (3 Credits)
Lectures include an overview of statistical methods commonly applied in genomics research. Specific methods can vary term to term, and could include cluster analysis, decision trees, dimension reduction tools, regression models, multiple testing adjustment, variable selection methods, etc. Journal clubs include team-based review and presentations of landmark papers in both statistical methodology and genomics research. Research experience includes whole-term collaboration between students from statistics and other disciplines on real projects.
Recommended: ST 411 or ST 511 or a higher level course such as ST 551

ST 595. CAPSTONE PROJECT. (3 Credits)
Provides an opportunity for students to integrate and apply the analytics skills learned in MS in Data Analytics program to solve real-world problems and to interpret and communicate their results. Students will engage in the entire process of solving data science projects in realistic settings, from placing the problem into appropriate statistical framework to applying suitable analytic methods to the problem. Problem solving, written and oral communication skills will be emphasized.
Prerequisites: ST 516 with C or better and ST 517 [C] and ST 518 [C] and ST 558 [C]

ST 599. SPECIAL TOPICS. (1-4 Credits)
May be repeated for credit when topic varies.
This course is repeatable for 16 credits.

ST 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ST 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ST 606. PROJECTS. (1-16 Credits)
Section 1: Projects; Section 2: Teaching Experience, graded P/N; Section 3: Directed Work, graded P/N.
This course is repeatable for 16 credits.

ST 623. GENERALIZED REGRESSION MODELS. (3 Credits)
Maximum likelihood analysis for frequency data; regression-type models for binomial and Poisson data; iterative weighted least squares and maximum likelihood; analysis of deviance and residuals; over-dispersion and quasilikelihood models; log-linear models for multidimensional contingency tables.
Prerequisites: ST 553 with C or better and ST 563 [C]

ST 625. SURVIVAL ANALYSIS. (3 Credits)
Prepares students to understand and analyze survival data. Concepts to be discussed include: hazard function (failure rate function); nonparametric likelihood; empirical processes; empirical distribution function; censoring (mostly right independent censoring); Kaplan-Meier estimator; Bias of the KM estimator; Cox proportional hazards model; Accelerated Failure Time Model; Partial Likelihood; log-rank test.
Prerequisites: ST 553 with C or better or ST 563 with C or better

ST 651. LINEAR MODEL THEORY. (3 Credits)
Least squares estimation, best linear unbiased estimation, parameterizations, multivariate normal distributions, distributions of quadratic forms, testing linear hypotheses, simultaneous confidence intervals. Offered alternate years.
Recommended: ST 553 and ST 563

ST 652. LINEAR MODEL THEORY . (3 Credits)
Prepares students to understand and analyze survival data. Concepts to be discussed include: hazard function (failure rate function); nonparametric likelihood; empirical processes; empirical distribution function; censoring (mostly right independent censoring); Kaplan-Meier estimator; Bias of the KM estimator; Cox proportional hazards model; Accelerated Failure Time Model; Partial Likelihood; log-rank test.
Prerequisites: ST 553 with C or better and ST 563 [C]

ST 661. ADVANCED THEORY OF STATISTICS. (3 Credits)
Exponential families, sufficient statistics; unbiased, equivarient, Bayes, and admissible estimation. Offered alternate years.
Recommended: ST 563 and MTH 511

ST 662. ADVANCED THEORY OF STATISTICS. (3 Credits)
Uniformly most powerful, unbiased, similar, and invariant tests. Offered alternate years.
Prerequisites: ST 661 with C or better
Recommended: ST 563 and MTH 511
ST 663. ADVANCED THEORY OF STATISTICS. (3 Credits)
First-order and higher-order asymptotics; likelihood ratio, score, and Wald tests; Edgeworth and saddlepoint approximations. Offered alternate years.
Prerequisites: ST 662 with C or better
Recommended: ST 563 and MTH 511

Data Analytics Graduate Certificate
Available only via Ecampus.
Certificate Code: CG17

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Required Core</td>
<td></td>
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</tr>
<tr>
<td>ST 516</td>
<td>FOUNDATIONS OF DATA ANALYTICS</td>
<td>4</td>
</tr>
<tr>
<td>ST 517</td>
<td>DATA ANALYTICS I</td>
<td>4</td>
</tr>
<tr>
<td>ST 518</td>
<td>DATA ANALYTICS II</td>
<td>4</td>
</tr>
<tr>
<td>ST 558</td>
<td>MULTIVARIATE ANALYTICS</td>
<td>3</td>
</tr>
<tr>
<td>ST 566</td>
<td>TIME SERIES ANALYTICS</td>
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<td>Total Hours</td>
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</table>

Certificate Code: CG17

Data Analytics Graduate Major (MS)
Available only via Ecampus.
Major Code: 6160

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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>Prerequisites</td>
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<tr>
<td>ST 516</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics to the level of calculus is recommended but not required</td>
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</tr>
<tr>
<td>Statistics Core</td>
<td></td>
<td></td>
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<tr>
<td>ST 516</td>
<td>FOUNDATIONS OF DATA ANALYTICS</td>
<td>4</td>
</tr>
<tr>
<td>ST 517</td>
<td>DATA ANALYTICS I</td>
<td>4</td>
</tr>
<tr>
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<td>DATA ANALYTICS II</td>
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<td>ST 558</td>
<td>MULTIVARIATE ANALYTICS</td>
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</tr>
<tr>
<td>ST 566</td>
<td>TIME SERIES ANALYTICS</td>
<td>3</td>
</tr>
<tr>
<td>ST 595</td>
<td>CAPSTONE PROJECT</td>
<td>3</td>
</tr>
<tr>
<td>Computer Science Core</td>
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<td></td>
</tr>
<tr>
<td>CS 511</td>
<td>PROGRAMMING AND DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>CS 512</td>
<td>DATA SCIENCE TOOLS AND PROGRAMMING</td>
<td>4</td>
</tr>
<tr>
<td>CS 513</td>
<td>(Applied Machine Learning [pending approval])</td>
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</tr>
<tr>
<td>Electives in Statistics</td>
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<td>Select 12 credits of the following:</td>
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<td>ST 515</td>
<td>DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS</td>
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<tr>
<td>ST 525</td>
<td>APPLIED SURVIVAL ANALYSIS</td>
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<tr>
<td>ST 537</td>
<td>DATA VISUALIZATION</td>
<td></td>
</tr>
<tr>
<td>ST 538</td>
<td>MODERN STATISTICAL METHODS FOR LARGE AND COMPLEX DATA SETS</td>
<td></td>
</tr>
<tr>
<td>ST 539</td>
<td>SURVEY METHODS</td>
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<tr>
<td>ST 591</td>
<td>INTRODUCTION TO QUANTITATIVE GENOMICS</td>
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<td>ST 592</td>
<td>STATISTICAL METHODS FOR GENOMICS RESEARCH</td>
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</table>

Major Code: 6160

Statistics Graduate Major (MA, MS, PhD)

Graduate Areas of Concentration
Statistics
The Department of Statistics offers Master of Arts, Master of Science, and Doctor of Philosophy degrees in Statistics. Students can concentrate on theory or applications, and programs can be tailored to emphasize such areas of interest as ecology, engineering, forestry, finance, mathematics, or oceanography. The thesis is optional for MS and MA degrees. Statistical consulting is part of the program, enabling the student to gain a deeper appreciation of the need, power, and applicability of statistical tools through exposure to real problems.

Major Code: 6150

MS in Statistics
The MS program is designed to prepare a candidate for a career in industry or government or for further study at the PhD level. Recent MS graduates have found employment with the U.S. Environmental Protection Agency, U.S. Census Bureau, Abt Associates, state of Oregon, Fred Hutchinson Cancer Research Center, Kaiser Permanente, Mayo Clinic, Bureau of Labor Statistics, Department of Veteran's Affairs, NOAA, MRI Global, and Capital One.

Prerequisites
- Single-variable and multivariable calculus (approximately 4 quarters).
- Linear algebra.
- One or more applied statistics courses (recommended, but not required).

Students who meet all of the requirements except for one or two courses may be granted provisional admission so they can begin their graduate studies while completing the remaining required courses. When the remedial course work is completed the Graduate School will remove the provisional status.

Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Required</td>
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<tr>
<td>ST 501</td>
<td>RESEARCH</td>
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<tr>
<td>ST 506</td>
<td>PROJECTS (Sect 2: Teaching Experience)</td>
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<tr>
<td>ST 507</td>
<td>SEMINAR (Sect 1: Attendance at Consulting Seminar)</td>
<td>1</td>
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<tr>
<td>ST 507</td>
<td>SEMINAR (Sect 3: Attendance at Research Seminar)</td>
<td>2</td>
</tr>
<tr>
<td>ST 509</td>
<td>CONSULTING PRACTICUM</td>
<td>2</td>
</tr>
<tr>
<td>ST 541</td>
<td>PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>ST 551</td>
<td>STATISTICAL METHODS</td>
<td>12</td>
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<tr>
<td>&amp; ST 552</td>
<td>and STATISTICAL METHODS</td>
<td></td>
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<tr>
<td>&amp; ST 553</td>
<td>and STATISTICAL METHODS</td>
<td></td>
</tr>
<tr>
<td>ST 561</td>
<td>THEORY OF STATISTICS</td>
<td>12</td>
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<tr>
<td>&amp; ST 562</td>
<td>and THEORY OF STATISTICS</td>
<td></td>
</tr>
<tr>
<td>&amp; ST 563</td>
<td>and THEORY OF STATISTICS</td>
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<tr>
<td>ST 623</td>
<td>GENERALIZED REGRESSION MODELS</td>
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<tr>
<td>Additional approved courses</td>
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<tr>
<td>Total Hours</td>
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</table>
Approved courses include all 500- and 600-level courses in the Statistics Department except:

ST 511, ST 512, ST 513
ST 515
ST 521, ST 522

Courses with a zero middle digit and courses in other departments may be used only with the consent of the major professor (and minor professor if the course is listed in the minor).

A student intending to pursue the PhD in Statistics should review the mathematics prerequisites and requirements for that program and plan a course of study to satisfy them.

Other Requirements

- Pass written comprehensive exams in statistical methods and in statistical theory. These exams are given each year in September.
- Pass a final oral exam.

PhD in Statistics

The PhD program is designed to prepare a candidate for a career in teaching and research. Recent PhD graduates have found employment with US Geological Survey, Chase Bank, Bureau of Labor Statistics, USDA Forest Service, Weyerhauser, as well as with universities in the U.S. and abroad.

Prerequisites

- Equivalent to the OSU Master’s degree in Statistics.
- Pass the MS comprehensive exams in methods and theory.
- Apply for admission to PhD program. (Evaluation is by the entire faculty. The evaluation criteria for admission are: course work, grades, MS comprehensive exam results, and any information you provide in your application giving evidence of capability to do original research.)
- Course work equivalent to MTH 311 and MTH 312.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MTH 511</td>
<td>REAL ANALYSIS</td>
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<tr>
<td>MTH 664</td>
<td>PROBABILITY THEORY</td>
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</tr>
<tr>
<td>ST 509</td>
<td>CONSULTING PRACTICUM</td>
<td>2</td>
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<tr>
<td>ST 541</td>
<td>PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>ST 551</td>
<td>STATISTICAL METHODS</td>
<td>12</td>
</tr>
<tr>
<td>&amp; ST 552</td>
<td>and STATISTICAL METHODS</td>
<td></td>
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<tr>
<td>&amp; ST 553</td>
<td>and STATISTICAL METHODS</td>
<td></td>
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<tr>
<td>ST 561</td>
<td>THEORY OF STATISTICS</td>
<td>12</td>
</tr>
<tr>
<td>&amp; ST 562</td>
<td>and THEORY OF STATISTICS</td>
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</tr>
<tr>
<td>&amp; ST 563</td>
<td>and THEORY OF STATISTICS</td>
<td></td>
</tr>
<tr>
<td>ST 603</td>
<td>THESIS $^1$</td>
<td>36</td>
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<tr>
<td>ST 623</td>
<td>GENERALIZED REGRESSION MODELS</td>
<td>6</td>
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<tr>
<td>&amp; ST 625</td>
<td>and SURVIVAL ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>ST 651</td>
<td>LINEAR MODEL THEORY</td>
<td>6</td>
</tr>
<tr>
<td>&amp; ST 652</td>
<td>and LINEAR MODEL THEORY</td>
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<tr>
<td>ST 661</td>
<td>ADVANCED THEORY OF STATISTICS</td>
<td>9</td>
</tr>
<tr>
<td>&amp; ST 662</td>
<td>and ADVANCED THEORY OF STATISTICS</td>
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<tr>
<td>&amp; ST 663</td>
<td>and ADVANCED THEORY OF STATISTICS</td>
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<tr>
<td>Select 30 credits to total about 120 credits of course work $^1$</td>
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<td>Total Hours</td>
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</table>

Credits completed for an MS degree as well as the 36 or more credits of ST 603 count toward this total. The specific courses to be taken are decided at a meeting of the PhD committee.

Other Requirements

- Pass the preliminary exam over PhD course work.
- Write a thesis describing the results of original research.
- Pass the final examination over thesis and related material.

Major Code: 6150

Statistics Graduate Minor

Minor Code: 6150

All programs must be approved by the student’s minor professor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 521</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS &amp; ST 522</td>
<td>and INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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<tr>
<td>ST 511</td>
<td>METHODS OF DATA ANALYSIS</td>
<td>8</td>
</tr>
<tr>
<td>&amp; ST 512</td>
<td>and METHODS OF DATA ANALYSIS</td>
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<tr>
<td>Select one or two courses from the following $^2$</td>
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<tr>
<td>ST 513</td>
<td>METHODS OF DATA ANALYSIS</td>
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</tr>
<tr>
<td>ST 515</td>
<td>DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS</td>
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<tr>
<td>ST 531</td>
<td>SAMPLING METHODS</td>
<td></td>
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<tr>
<td>ST 535</td>
<td>QUANTITATIVE ECOLOGY</td>
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<tr>
<td>ST 557</td>
<td>APPLIED MULTIVARIATE ANALYSIS</td>
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<tr>
<td>ST 565</td>
<td>TIME SERIES</td>
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<tr>
<td>ST 521</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS &amp; ST 522</td>
<td>and INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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<td>ST 561</td>
<td>THEORY OF STATISTICS &amp; ST 562</td>
<td>and THEORY OF STATISTICS &amp; ST 563</td>
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<tr>
<td>Select one course from the following:</td>
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<tr>
<td>ST 551</td>
<td>STATISTICAL METHODS &amp; ST 552</td>
<td>and STATISTICAL METHODS &amp; ST 553</td>
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<td>ST 511</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>&amp; ST 512</td>
<td>and METHODS OF DATA ANALYSIS &amp; ST 513</td>
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<td>Select additional statistics courses approved by the minor professor $^2$</td>
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<td>Total Hours</td>
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<td>23-27</td>
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</table>

1. The student and/or minor professor may wish to add one or two additional courses
2. If ST 551, ST 552, and ST 553 are taken, the additional courses should total at least 3 credits
   If ST 511, ST 512, and ST 513 are taken, they should total at least 6 credits

Minor Code: 6150

Statistics Minor

Minor Code: 615

[1]: Approved courses include all 500- and 600-level courses in the Statistics Department except:
[2]: The student and/or minor professor may wish to add one or two additional courses
The undergraduate minor in Statistics requires a minimum of 27 credits in statistics.

<table>
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<tr>
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<tbody>
<tr>
<td>ST 201</td>
<td>PRINCIPLES OF STATISTICS</td>
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<tr>
<td>or ST 314</td>
<td>INTRODUCTION TO STATISTICS FOR ENGINEERS</td>
<td></td>
</tr>
<tr>
<td>or ST 351</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
<td>4</td>
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<td>ST 407</td>
<td>SEMINAR (Attendance at Consulting Practicum)</td>
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<td>ST 421</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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<tr>
<td>&amp; ST 422</td>
<td>and INTRODUCTION TO MATHEMATICAL STATISTICS</td>
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Approved Courses
Select at least 10 credits of additional approved courses: ¹

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<tr>
<td>BOT 440</td>
<td>FIELD METHODS IN PLANT ECOLOGY</td>
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<tr>
<td>ECE 461</td>
<td>INTRODUCTION TO ANALOG AND DIGITAL COMMUNICATIONS</td>
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<td>ECON 424</td>
<td>INTRODUCTION TO ECONOMETRICS</td>
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<td>FOR 321</td>
<td>FOREST MENSURATION</td>
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<td>H 425</td>
<td>FOUNDATIONS OF EPIDEMIOLOGY</td>
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<td>IE 355</td>
<td>STATISTICAL QUALITY CONTROL</td>
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<td>IE 356</td>
<td>EXPERIMENTAL DESIGN FOR INDUSTRIAL PROCESSES</td>
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<td>MTH 465</td>
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<td>ACTUARIAL MATHEMATICS</td>
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<td>PSY 301</td>
<td>RESEARCH METHODS IN PSYCHOLOGY</td>
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<tr>
<td>SOC 315</td>
<td>*METHODS I: RESEARCH DESIGN</td>
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<td>ST 411</td>
<td>METHODS OF DATA ANALYSIS</td>
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<td>&amp; ST 412</td>
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<td>&amp; ST 413</td>
<td>and METHODS OF DATA ANALYSIS</td>
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<tr>
<td>&amp; ST 415</td>
<td>DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS</td>
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<td>ST 431</td>
<td>SAMPLING METHODS</td>
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<td>ST 435</td>
<td>QUANTITATIVE ECOLOGY</td>
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<td>ST 439</td>
<td>SURVEY METHODS</td>
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<td>ST 441</td>
<td>PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS</td>
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<tr>
<td>ST 499</td>
<td>SPECIAL TOPICS</td>
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</table>

Total Hours 27

¹ Writing Intensive Course (WIC)

Other statistics-related courses may be substituted, subject to departmental approval

Minor Code: 615

College of Veterinary Medicine

The Carlson College of Veterinary Medicine at Oregon State University was established in 1975 with three major areas of responsibility—teaching, research, and public service. The college is fully accredited by the American Veterinary Medical Association’s Council on Education.

200 Magruder Hall
Oregon State University
Corvallis, OR 97331-4801
Phone: 541-737-2098
Email: cvmproginfo@oregonstate.edu
Website: http://vetmed.oregonstate.edu/

Administration
Susan J. Tornquist, Lois Bates Acheson Dean, 541-737-6943, susan.tornquist@oregonstate.edu

Luiz Bermudez, Head, Department of Biomedical Sciences, 541-737-6532, luiz.bermudez@oregonstate.edu
Chris Cebr, Chair, Department of Clinical Sciences, 541-737-4456, chris.cebra@oregonstate.edu
Helio de Morais, Director, Veterinary Teaching Hospital, 541-737-4458, helio.demorais@oregonstate.edu
Mark Ackermann, Director, Veterinary Diagnostic Laboratory, 541-737-6964, mark.ackermann@oregonstate.edu

Teaching

The college was established in 1975 and began its professional education program in 1979. Approximately 40 residents of Oregon and 32 nonresident students are selected to enter the OSU Carlson College of Veterinary Medicine. These students will complete all four years of their professional education in Corvallis. Completion of the professional program leads to the Doctor of Veterinary Medicine (DVM) degree.

There are two departments supporting the DVM doctoral program: Biomedical Sciences and Clinical Sciences.

Comprehensive research training is provided through graduate programs leading to the MS degree in Comparative Health Sciences.

Post-DVM residency training leading to board eligibility in several clinical disciplines and pathology is also available.

Research

Biomedical research is conducted in the college, supported by federal agencies such as NIH, USDA, DOE, as well as by a number of foundations. Collaboration with the OSU Agricultural Experiment Station, colleges of Pharmacy, Public Health and Human Sciences, Engineering and many other colleges, is part of the program. The research is of economic and public health significance, aimed at improving the health of animals and people.

The college emphasizes research of infectious diseases, such as those caused by Mycobacteria, Chlamydia, Clostridia, Vibrio, Mycoplasma, Cryptosporidium, herpesvirus, respiratory syncytial virus, influenza virus, and HIV-1 virus. Research is also conducted on immunity and nutrition, neuroscience, cancer, cardiovascular diseases, diabetes, reproductive diseases, and diseases of terrestrial and aquatic wildlife.

Public Service

The service programs focus on the diagnosis, prevention, treatment, and control and prevention of animal diseases. The college assists veterinary practitioners, animal owners, and the general public through the Oregon Veterinary Diagnostic Laboratory and the Veterinary Teaching Hospital.

The Oregon Veterinary Diagnostic Laboratory is a full-service facility providing a wide range of animal disease diagnostic testing services to veterinarians, animal owners, and public agencies. The laboratory offers testing and expertise in pathology, clinical pathology, bacteriology, and virology, and is accredited by the American Association of Veterinary Laboratory Diagnosticians.

The Veterinary Teaching Hospital is designed and equipped for diagnosis and medical and surgical treatment of canine, feline, equine, food animal, and camelid patients. Patients are admitted directly from animal owners and through referrals from practicing veterinarians in Oregon and the Pacific Northwest. Imaging (radiology, ultrasonography, fluoroscopy, CAT
During the fourth year of the veterinary curriculum, students complete in Institutional Animal Care and Use committee. All use of animals in teaching is approved by the university's Institutional Animal Care and Use committee. In most instances, the animals are anesthetized. Strict protocol is enforced regarding the animals' well-being in exercises requiring post-operative recovery. All use of animals in teaching is approved by the university's Institutional Animal Care and Use committee. Providing continuing education for veterinarians is also considered a major responsibility of the college. One- to three-day intensive courses of instruction on specific topics are offered periodically.

Career Opportunities in Veterinary Medicine

Opportunities for employment in veterinary medicine are excellent. Nearly 80 percent of the professionally active veterinarians in the United States are engaged in private practice. Some practices are limited to types of animals, such as food animal, equine, or companion animal practices. Others involve specialties such as surgery, ophthalmology, cardiology, or radiology. In addition to private practice, there are numerous teaching and research opportunities in academic, government, and industrial settings. Expanding areas include laboratory animal medicine and public health.

Veterinary Student Expenses

Oregon resident students registered in the Carlson College of Veterinary Medicine will pay tuition and fees of approximately $8,507 per term. Students from the WICHE (http://www.wiche.edu/states/) states will pay the same fees as Oregon resident students. Nonresident student fees currently are $16,263 per term.

Veterinary students must provide required professional attire, as well as dissection, surgical, and diagnostic instruments, and notes and books.

Occasional field trips are scheduled in the veterinary curriculum. Transportation is provided by the university for required trips, but students must provide their own food and lodging. For optional trips, the student is usually expected to provide transportation, lodging, and food. All other expenses, such as residence hall and living expenses, are the same as for students in other colleges of the university.

Students desiring additional information about veterinary medicine should write to the Office of the Dean, Carlson College of Veterinary Medicine, Oregon State University, 200 Magruder Hall, Corvallis, Oregon 97331-4801, email cvmproginfo@oregonstate.edu or see our website (http://vetmed.oregonstate.edu/).

Policy on Laboratory and Duty Hours

During the professional curriculum, several laboratory exercises in the preclinical years require the use of live animals. The exercises are designed to complement didactic lectures and demonstrations through hands-on experience with various species of animals. In all instances, the animals are humanely treated and anesthetized if the procedures are potentially painful.

During the clinical years, animals are used in laboratory exercises in the teaching of basic surgical skills and medical procedures. In most instances, the animals are anesthetized. Strict protocol is enforced regarding the animals' well-being in exercises requiring post-operative recovery. All use of animals in teaching is approved by the university’s Institutional Animal Care and Use committee.

During the fourth year of the veterinary curriculum, students complete rotations in sections of the Veterinary Teaching Hospital and Oregon Veterinary Diagnostic Laboratory. Emergency services are offered to the public on a 24-hour basis, seven days a week. Student assignments in the clinical blocks are demanding, and students are required to spend time at night, weekends, and holidays in the delivery of health care to patients. Hospital operations continue seven days per week, and students are responsible for their assigned tasks regardless of time and day of the week.

DVM and MPH Dual Degree

Students enrolled in the Doctor of Veterinary Medicine (DVM) degree program wishing also to complete a Master’s of Public Health Degree may do so if successfully admitted to the Graduate School and the College of Public Health and Human Sciences (CPHHS). Using pre-approved and cross-listed courses as electives, veterinary students may complete the MPH degree (http://health.oregonstate.edu/degrees/graduate/public-health/mph/dvm-mph-dual-degree/) with an additional (5th) year of study.

The CPHHS offers an MPH degree in six tracks: Biostatistics; Epidemiology; Environment, Safety and Health; Health Management and Policy; Health Promotion and Health Behavior; and International Health.

In order to maximize use of elective courses in the dual degree program, it is important that veterinary students enter the dual degree option as early in their studies as possible. The five core MPH courses are offered through distance education. In consultation with the student's MPH adviser, internships, culminating activities and senior papers should be coordinated as well. The student's MPH adviser must approve all veterinary courses counted toward the graduate (MPH) degree.

Biomedical Sciences

Luiz E. Bermudez, Head
105 Dryden Hall
Oregon State University
Corvallis, OR 97331-4801
Phone: 541-737-6532
Email: cvm.biomed@oregonstate.edu
Website: https://vetmed.oregonstate.edu/biomed (https://vetmed.oregonstate.edu/biomed/)

Faculty
Professors Bermudez, Bildfell, Hall, Häse, Heidel, Jin, Kent, Löhr, Magnusson, Rockey, Sarker, Tornquist, Valentine
Associate Professors Dolan, Gorman, Jolles, Medlock, Moulton, O'Reilly, Pastey, Shulzhenko
Assistant Professors Beechler, Chappell, Danelishvili, D. Johns, J. Johns, Miller-Morgan, Nigussie, Puttachary, Ramsey, Russell, Sanders, Schubiger, Spagnoli
Instructors Alcantar, Grossman, Mansouri, Sona
Adjunct Fu
Emeriti Blythe
courtesy Burco, Steinauer

Clinical Sciences

Chris Cebra, Chair
Department of Clinical Sciences
272 Magruder Hall
Oregon State University
Corvallis, OR 97331-4801
Faculty
Professors Cebra, de Morais, Estill, Huber, McKenzie, Riebold, Semevolos
Associate Professors Baltzer, Gordon, Mandsager, Milovancev, Parker, Ruaux, Scollan, Stieger-Vanegas, Warnock, Zelimer
Assistant Professors Biskup, Bracha, Cooley, Curran, Holder, Klopfenstein, LeBlanc, Lhee, Mecham, Montilla, Nemanic, Pacheco, Palmer, Schlipf, Townsend, Vanegas, Whitler
Instructor Husby, Miller
Emeriti Crisman, Pearson, Sisson, Watrous
Adjunct Campbell
Courtesy Brown, Otteman

Professional Programs
- Doctor of Veterinary Medicine (p. 1050)

Veterinary Medicine Biomedical

VMB 110. PREVETERINARY MEDICINE. (1 Credit)
Introduction to the profession's role in society. Graded P/N.
Equivalent to: VM 110

VMB 228. WILDLIFE CAPTURE AND IMMOBILIZATION. (2 Credits)
Manual and chemical restraint methods are covered with an emphasis on darting equipment, animal and human safety, drug pharmacology and species specific recommendations. CROSSLISTED as FW 228/VMB 228.
Equivalent to: FW 228
This course is repeatable for 4 credits.

VMB 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

VMB 415. ONE HEALTH IN PRACTICE. (3 Credits)
One health is the concept that human, animal and environmental health are all intertwined. Utilizes current one health issues such as disease outbreaks and antimicrobial resistance to encourage students from diverse fields to develop interdisciplinary collaboration and communication skills. CROSSLISTED as BHS 415/VMB 415.
Equivalent to: BHS 415

VMB 599. SPECIAL TOPICS. (1-16 Credits)
Special studies course to allow different instructors the ability to teach a new class or one time class. Graded P/N.
This course is repeatable for 16 credits.

VMB 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 501
This course is repeatable for 16 credits.

VMB 503. THESIS. (1-12 Credits)
This course is repeatable for 999 credits.

VMB 504. WRITING AND CONFERENCE (NON-THESIS). (1-9 Credits)
This course is repeatable for 9 credits.

VMB 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: VM 505
This course is repeatable for 16 credits.

VMB 507. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: VM 507
This course is repeatable for 16 credits.

VMB 517. VETERINARY PHYSIOLOGY. (5 Credits)
Physiology of body fluids, muscles, membranes, intermediary metabolism, cardiovascular system, and metabolism.
Equivalent to: VM 517

VMB 518. VETERINARY PHYSIOLOGY. (5 Credits)
Physiology of gastrointestinal, endocrine and reproductive systems.
Prerequisites: VMB 517 with C or better
Equivalent to: VM 518

VMB 519. VETERINARY PHYSIOLOGY. (4 Credits)
Physiology of respiratory and renal systems and acid-base balance.
Prerequisites: VMB 518 with C or better
Equivalent to: VM 519

VMB 521. ANIMAL MODELS. (3 Credits)
Selection/use criteria for models describing animal or human diseases or processes with emphasis on experimental design, validation, transgenic technology, population dynamics, husbandry, and ethics.

VMB 523. ZOOHOSES. (3 Credits)
Interactive examination of the molecular basis of diseases that are transmissible between animals and humans. Emphasis on bacterial, viral and parasitic pathogens of animals and humans.

VMB 601. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 601
This course is repeatable for 16 credits.

VMB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

VMB 604. WRITING AND CONFERENCE (NON-THESIS). (1-9 Credits)
This course is repeatable for 9 credits.

VMB 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: VM 605
This course is repeatable for 16 credits.

VMB 606. PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: VM 606
This course is repeatable for 16 credits.

VMB 607. SEMINAR. (1-16 Credits)
One-credit section; VMB 607 Sect. 1. Graded P/N.
Equivalent to: VM 607
This course is repeatable for 16 credits.

VMB 611. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 611

VMB 612. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 612

VMB 613. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 613
VMB 614. VETERINARY MICROSCOPIC ANATOMY. (4 Credits)
Structure and development of cells, tissues, organs, and organ systems of animals.
Equivalent to: VM 614

VMB 615. VETERINARY MICROSCOPIC ANATOMY. (3 Credits)
Structure and development of cells, tissues, organs, and organ systems of animals.
Equivalent to: VM 615

VMB 616. VETERINARY NEUROSCIENCES. (4 Credits)
Structural and functional relationships of the nervous system and organs of special sense with emphasis on general clinical application.

VMB 620. VETERINARY IMMUNOLOGY. (5 Credits)
Clinical and diagnostic aspects of immunological mechanisms, serological reactions; hypersensitivity, allergy, and disorders of the immune system.
Equivalent to: VM 620

VMB 621. GENERAL PATHOLOGY. (4 Credits)
General principles of pathology, cell injury and death, inflammation and tissue repair, abnormalities of cell growth, and structures and mechanisms of disease.
Equivalent to: VM 621

VMB 622. PATHOLOGY LABORATORY. (1 Credit)
Laboratory instruction to complement VMB 621. Prerequisites: VMB 611 (may be taken concurrently) with C or better
Equivalent to: VM 622

VMB 624. ANTIBIOTIC STEWARDSHIP. (1 Credit)
Elective course for students to learn about significant aspects of antibiotic resistance. Intended to become part of the "One Health Program", resulting in the ability to create a plan for effective antibiotic stewardship as it relates to human, animal, and environmental health.

VMB 627. ORNAMENTAL FISH MEDICINE. (2 Credits)
An introduction to the basic principles of ornamental fish medicine including basic husbandry, handling and clinical procedures. This is a 1-week intensive course held at the Hatfield Marine Science Center in Newport, Oregon. Graded P/N.

VMB 630. MECHANISMS OF DISEASE. (3 Credits)
Cellular and molecular events that contribute to the pathogenesis of disease in animals, including humans. Host interactions with infectious agents and the environment.
Equivalent to: VM 630

VMB 631. MATHEMATICAL MODELING OF BIOLOGICAL SYSTEMS. (3 Credits)
The use of mathematical modeling in biological sciences is studied. A variety of modeling techniques are covered including implementing the methods computationally.

VMB 640. SEMINARS IN LABORATORY ANIMAL MEDICINE. (2 Credits)
Prepares students for careers in laboratory animal medicine. Provides a review of medical conditions, diagnosis and treatment of research animals.

VMB 641. SEMINARS IN LABORATORY ANIMAL MEDICINE. (2 Credits)
Prepares students for careers in laboratory animal medicine. Provides a review of medical conditions, diagnosis and treatment for research animals.

VMB 642. SEMINARS IN LABORATORY ANIMAL MEDICINE. (2 Credits)
Prepares students for careers in laboratory animal medicine. Provides a review of medical conditions, diagnosis and treatment for research animals.

VMB 651. SELECTED TOPICS IN VETERINARY MEDICINE. (3 Credits)
Topics vary; check Schedule of Classes for particular topics. Equivalent to: VM 651

VMB 652. CANCER SYSTEMS BIOLOGY. (3 Credits)
Overview of systems biology approaches that are being used to study cancer, with an emphasis on omics techniques and fundamental mechanisms in the origination and progression of cancer. Discussion-based, with each class session focused on a contemporary research article in the field of cancer systems biology.

VMB 653. VETERINARY VIROLOGY. (4 Credits)
Virology for the professional and graduate student.

VMB 659. VETERINARY BACTERIOLOGY AND MYCOLOGY. (5 Credits)
Veterinary bacteriology and mycology for the veterinary graduate student.

VMB 666. VETERINARY MEDICINE AND PUBLIC HEALTH. (3 Credits)
Covers aspects of veterinary medicine that affect human health. An understanding of the contribution of the veterinary profession to human (public) health will enable students to play an effective role in this area, regardless of career direction.

VMB 667. VETERINARY EPIDEMIOLOGY. (3 Credits)
A course for veterinary students describing the factors determining the frequency and distribution of diseases, in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.

VMB 669. INTRODUCTION TO GRANT PROPOSAL WRITING. (2 Credits)
To introduce students to the fundamentals of writing grant proposals to the National Institute of Health (NIH), different funding mechanisms, as well as the grant reviewing process. CROSSLISTED as PHAR 669/VM 669.
Equivalent to: PHAR 669
This course is repeatable for 20 credits.

VMB 670. INTRODUCTION TO SYSTEMS BIOLOGY. (2 Credits)
Students will gain a high-level overview of systems biology and bioinformatics, with an emphasis on biomedical applications, integration of 'omics' approaches, and biological networks.

VMB 671. MOLECULAR TOOLS. (3 Credits)
Intended for personnel with some scientific background who are seeking basic- and advanced-level molecular biology knowledge and who wish to become involved with molecular biology-related and biotechnological research. CROSSLISTED as MCB 671/VM 671.
Equivalent to: MCB 671
**VMB 672. MOLECULAR APPROACH TO CANCER. (1 Credit)**
Overview of cancer pathogenesis and current molecular techniques to diagnose and treat various neoplasms is provided. Content will include both veterinary and human data and concepts. Discussion/Lab. Graded P/N.

**VMB 673. COMPARATIVE IMMUNOLOGY. (3 Credits)**
Examines immune system function in animals other than mice and men with a focus on adapting cutting-edge technologies.

**VMB 674. VACCINES AND NEW THERAPIES. (3 Credits)**
Provides students with a cohesive understanding of the basic research behind the discovery of new therapeutic targets and scientific advancements used in development of vaccines and new therapies.

**VMB 699. SPECIAL TOPICS. (1-16 Credits)**
*This course is repeatable for 99 credits.*

**VMB 701. RESEARCH. (1-16 Credits)**
Equivalent to: VM 701
*This course is repeatable for 16 credits.*

**VMB 705. READING AND CONFERENCE. (1-16 Credits)**
Equivalent to: VM 705
*This course is repeatable for 16 credits.*

**VMB 706. PROJECTS. (1-16 Credits)**
Equivalent to: VM 706
*This course is repeatable for 16 credits.*

**VMB 709. VETERINARY MEDICINE ORIENTATION. (1 Credit)**
An overview of veterinary medicine with emphasis on historical development, current veterinary medical issues, employment opportunities, and professionalism. Graded P/N.

Equivalent to: VM 709

**VMB 711. VETERINARY GROSS ANATOMY. (4 Credits)**
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.

Equivalent to: VM 711

**VMB 712. VETERINARY GROSS ANATOMY. (4 Credits)**
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.

Equivalent to: VM 712

**VMB 713. VETERINARY GROSS ANATOMY. (4 Credits)**
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken. Lec/lab.

Equivalent to: VM 713

**VMB 714. VETERINARY MICROSCOPIC ANATOMY. (4 Credits)**
Structure and development of cells, tissues, organs, and organ systems of animals.

Equivalent to: VM 714

**VMB 715. VETERINARY MICROSCOPIC ANATOMY. (3 Credits)**
Structure and development of cells, tissues, organs, and organ systems of animals.

Equivalent to: VM 715

**VMB 716. VETERINARY NEUROSCIENCES. (4 Credits)**
Structural and functional relationships of the nervous system and organs of special sense with emphasis on general clinical application.

Equivalent to: VM 716

**VMB 717. VETERINARY PHYSIOLOGY. (5 Credits)**
Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation.

Equivalent to: VM 717

**VMB 718. VETERINARY PHYSIOLOGY. (5 Credits)**
Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation.

Equivalent to: VM 718

**VMB 719. VETERINARY PHYSIOLOGY. (4 Credits)**
Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation. Lec/lab.

Equivalent to: VM 719

**VMB 720. VETERINARY IMMUNOLOGY. (5 Credits)**
Clinical and diagnostic aspects of immunological mechanisms, serological reactions, hypersensitivity, allergy, and disorders of the immune system. Lec/lab.

Equivalent to: VM 720

**VMB 721. VETERINARY PATHOLOGY. (5 Credits)**
Basic mechanisms and concepts relating to reaction of cells and tissues to disease, with emphasis on cellular and tissue degeneration, inflammatory reaction, circulatory disturbance and neoplasia. Lec/lab.

Equivalent to: VM 721

**VMB 722. RESEARCH READING SKILLS FOR VETERINARY STUDENTS. (1 Credit)**
Training in critical evaluation of biomedical and clinical research studies, and understanding of laboratory diagnostic methods.

**VMB 723. VETERINARY LEADERSHIP: INCLUSION, REFLECTION, DEVELOPMENT. (1 Credit)**
Focusing on diversity and inclusion, self-compassion, and effective interpersonal communication in relationship to fostering leadership in veterinary medicine. Graded P/N.

*This course is repeatable for 10 credits.*

**VMB 724. ANTIBIOTIC STEWARDSHIP. (1 Credit)**
Elective course for students to learn about significant aspects of antibiotic resistance. Intended to become part of the “One Health Program”, resulting in the ability to create a plan for effective antibiotic stewardship as it relates to human, animal, and environmental health.

**VMB 726. PET BIRD AND SMALL MAMMAL MEDICINE AND SURGERY. (2 Credits)**
Medicine and surgery of pet birds and small animals. Graded P/N.

**VMB 727. ORNAMENTAL FISH MEDICINE. (2 Credits)**
An introduction to the basic principles of ornamental fish medicine including basic husbandry, handling and clinical procedures. Graded P/N.

**VMB 728. SPECIAL ANIMAL MEDICINE. (4 Credits)**
Diagnosis, treatment, and management of special animals, including the common laboratory animals.

Equivalent to: VM 728
*This course is repeatable for 8 credits.*
VMB 729. LAB ANIMAL/PRIMATE MEDICINE AND SURGERY. (3-12 Credits)
Designed to provide hands-on experience with a variety of laboratory animal species including primates, rodents, ungulates, fish, and reptiles. May be repeated up to 4 times for 3, 6, 9 or 12 credits per term. 12 credits maximum apply toward graduation. Graded P/N. This course is repeatable for 12 credits.

VMB 730. LARGE ANIMAL MEDICINE AND SURGERY LABORATORY. (1 Credit)
Development of physical examination skills and common diagnostic and surgical procedures for domestic large animal species.

VMB 736. DIAGNOSTIC CLINICAL PATHOLOGY. (2 Credits)
One week clinical experience in clinical pathology, cytology, urinalysis, clinical chemistry interpretation and hematology. Lec/lab.
Equivalent to: VM 736

VMB 740. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
The first of three 1-credit courses in problem solving and integration of clinical cases and basic sciences in the veterinary curriculum.
Equivalent to: VM 740

VMB 741. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
The second of three 1-credit courses in problem solving and integration of clinical cases and basic sciences in the veterinary curriculum.
Equivalent to: VM 741

VMB 742. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
The third of three 1-credit courses in problem solving and integration of clinical cases and basic sciences in the veterinary curriculum. Graded P/N.
Equivalent to: VM 742

VMB 743. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
A course in problem solving and integration of clinical cases and basic sciences in the veterinary curriculum. Students learn through interaction with their peers and with independent study outside of class. Graded P/N.
Equivalent to: VM 743

VMB 744. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
A course in problem solving and integration of clinical cases and basic sciences in the veterinary curriculum. Students learn through interaction with their peers and with independent study outside of class. Graded P/N.
Equivalent to: VM 744

VMB 745. COMMUNICATIONS FOR VETERINARIANS. (1 Credit)
Communications and problem solving for the third-year veterinary student. Graded P/N.

VMB 749. WILDLIFE SAFARI. (2 Credits)
Clinical training in the care of exotic and zoo animal species. Graded P/N.

VMB 750. SYSTEMIC PATHOLOGY I. (4 Credits)
Examines the principles of system and organ responses to injury and the consequent effects of these changes on the host.
Equivalent to: VM 7500

VMB 751. SYSTEMIC PATHOLOGY II. (5 Credits)
Examines the principles of system and organ responses to injury and the consequent effects of these changes on the host.
Equivalent to: VM 751

VMB 753. VETERINARY VIROLOGY. (4 Credits)
Virology for the professional DVM student.
Equivalent to: VM 753

VMB 756. ADVANCED CLINICAL PATHOLOGY. (1 Credit)
One-week rotation in advanced clinical pathology: cytology, hematology and clinical chemistry interpretation. Graded P/N.
Prerequisites: VM 736 with C or better

VMB 759. VETERINARY BACTERIOLOGY AND MYCOLOGY. (5 Credits)
Bacteriology and mycology for the professional DVM student.
Equivalent to: VM 759

VMB 760. VETERINARY PARASITOLOGY. (5 Credits)
A study of the parasitic diseases of domestic animals with an emphasis on diagnosis and treatment. Fundamentals in host-parasite interactions, taxonomy and life cycle strategies are covered.
Equivalent to: VM 760

VMB 761. VETERINARY PHARMACOLOGY. (2 Credits)
Fundamentals of pharmacology as related to veterinary medicine presented in a systems-oriented approach with drug therapy in domestic animals.
Equivalent to: VM 761

VMB 762. VETERINARY PHARMACOLOGY II. (4 Credits)
Fundamentals of pharmacology as related to veterinary medicine presented in a systems-oriented approach with drug therapy in domestic animals.
Equivalent to: VM 762

VMB 763. VETERINARY CLINICAL PATHOLOGY. (4 Credits)
Clinical pathology for the professional DVM student.
Equivalent to: VM 763

VMB 765. VETERINARY TOXICOLOGY. (4 Credits)
A study of toxic agents, mechanisms of action, toxicosis and treatments, especially as related to domestic and wild animals, with principles of toxicity testing, clinical diagnosis, and identification of poisonous plants. Lec/lab.
Equivalent to: VM 765

VMB 766. EPIDEMIOLOGY AND PUBLIC HEALTH. (3 Credits)
Examination of the application of epidemiology to the field of veterinary medicine and the study of important veterinary public health issues.
Equivalent to: VM 766

VMB 767. VETERINARY EPIDEMIOLOGY. (3 Credits)
Examines factors determining the frequency and distribution of diseases in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.
Equivalent to: VM 767

VMB 768. BASIC HISTOPATHOLOGY. (1 Credit)
A rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species. Graded P/N.
Prerequisites: VM 751 with C or better

VMB 769. ANIMAL GENOMICS. (1 Credit)
Discussion about the dog and cow genomes, susceptibility to diseases, and the possibilities and techniques for treatment of medical conditions by gene transfer and modification.

VMB 772. INTERNATIONAL VETERINARY MEDICINE. (2 Credits)
Veterinary students work with veterinarians and domestic animals in international settings. Graded P/N. This course is repeatable for 4 credits.
VMB 774. LABORATORY ANIMAL MEDICINE. (6 Credits)
Clinical experience related to diagnosis, treatment, and management of laboratory animals. Graded P/N.
Equivalent to: VM 774

VMB 786. ADVANCED HISTOPATHOLOGY. (2 Credits)
A rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species.

VMB 795. DIAGNOSTIC SERVICES. (2 Credits)
Students will perform service duty in the necropsy area of the Veterinary Diagnostic Laboratory and will perform necropsies on delivered specimens. Other activities.

Veterinary Medicine Clinical

VMC 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 501
This course is repeatable for 16 credits.

VMC 503. THESIS. (1-12 Credits)
Equivalent to: VM 503
This course is repeatable for 999 credits.

VMC 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: VM 505
This course is repeatable for 16 credits.

VMC 507. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: VM 507
This course is repeatable for 16 credits.

VMC 509. TEACHING PRACTICUM FOR VETERINARY PROFESSIONAL CURRICULUM. (1-6 Credits)
Provides veterinary specialty residents and graduate students a mentored experience in teaching of veterinary medical students. Experience can be gained with teaching of lecture and/or laboratory courses.
This course is repeatable for 6 credits.

VMC 601. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 601
This course is repeatable for 16 credits.

VMC 603. THESIS. (1-16 Credits)
Equivalent to: VM 603
This course is repeatable for 999 credits.

VMC 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: VM 605
This course is repeatable for 16 credits.

VMC 607. SEMINAR. (1-16 Credits)
One-credit section; VMC 607 Sect. 1. Graded P/N.
Equivalent to: VM 607
This course is repeatable for 16 credits.

VMC 632. POSTGRADUATE MEDICINE. (3-7 Credits)
An interactive, practical course on the role of scholarship in clinical medicine, including techniques to develop and conduct research in a clinical setting.
This course is repeatable for 16 credits.

VMC 634. POSTGRADUATE SURGERY. (3-7 Credits)
An interactive, practical course on the role of scholarship in clinical surgery, including techniques to develop and conduct research in a clinical setting.
This course is repeatable for 16 credits.

VMC 637. POSTGRADUATE CARDIOLOGY. (3-7 Credits)
An interactive, practical course on the role of scholarship in clinical cardiology, including techniques to develop and conduct research in a clinical setting.
This course is repeatable for 16 credits.

VMC 682. TOPICS IN INTERNAL MEDICINE. (2-4 Credits)
In-depth investigation of important topics in physiology, pathophysiology, treatment, diagnosis, and other aspects of internal medicine through investigation of primary literature and recent reviews.
This course is repeatable for 16 credits.

VMC 684. TOPICS IN SURGERY. (2-4 Credits)
In-depth investigation of important topics in physiology, pathophysiology, treatment, diagnosis, and other aspects of surgery through investigation of primary literature and recent reviews.
This course is repeatable for 16 credits.

VMC 701. RESEARCH. (1-16 Credits)
Equivalent to: VM 701
This course is repeatable for 16 credits.

VMC 705. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: VM 705
This course is repeatable for 16 credits.

VMC 706. PROJECTS. (1-16 Credits)
Equivalent to: VM 706
This course is repeatable for 16 credits.

VMC 711. CLINICAL CARDIOLOGY. (1-4 Credits)
A one-week clinical elective rotation in cardiology at the Veterinary Teaching Hospital. May be repeated up to 4 times, two weeks or more is encouraged. Fourth-year standing in Veterinary Medicine required.
This course is repeatable for 4 credits.

VMC 712. CLINICAL ONCOLOGY. (1-4 Credits)
A one-week clinical elective rotation in clinical oncology at the Veterinary Teaching Hospital. May be repeated up to 4 times, two weeks or more is encouraged. Fourth-year standing in Veterinary Medicine required.
Prerequisites: VMC 778 with C or better
This course is repeatable for 4 credits.

VMC 714. SMALL ANIMAL DENTISTRY. (1 Credit)
A clinical course designed to provide students with hands-on training in diagnosis, treatment and prophylaxis of dental diseases of dogs and cats.

VMC 715. CASE STUDIES IN SMALL ANIMAL MEDICINE I. (1 Credit)
A case-based course involving diseases and conditions of the endocrine, gastrointestinal and hepatobiliary systems as well as neoplastic and infectious diseases of small animals.

VMC 716. CASE STUDIES IN SMALL ANIMAL MEDICINE II. (1 Credit)
A case-based course involving diseases and conditions of the cardiovascular, respiratory and urogenital systems as well as emergent diseases and conditions.
VMC 717. CASE STUDIES IN SMALL ANIMAL MEDICINE III. (1 Credit)
A case-based course involving diseases and conditions of the dermatologic, neurologic, ophthalmologic, and hemolymphatic systems.

VMC 718. SMALL ANIMAL PREVENTIVE MEDICINE. (2 Credits)
Introductory course to basic concepts in small animal preventive medicine including vaccine immunology, vaccine strategies, internal/external parasite control, nutrition in disease prevention, and wellness programs for dogs and cats.

VMC 719. CLINICAL CARDIOLOGY I. (2 Credits)
Hands-on practical experience in a clinical setting in taking a clinical history, performing a cardiovascular physical examinations, recording electrocardiograms, interpreting thoracic radiographs and echocardiograms, creating problem lists, compiling lists of differential diagnosis, formulating diagnostic and therapeutic plans, discussing treatment options, generating medical records, and discharging patients.

VMC 720. VETERINARY CLINICAL NUTRITION. (2 Credits)
To examine the nutritional needs of many species of veterinary importance. Emphasis is placed on designing feeding programs to optimize health and animal performance.

VMC 721. SMALL ANIMAL CLINICAL NUTRITION. (1 Credit)
Introduction to the concepts of small animal clinical nutrition and is designed for the third-year veterinary student.

VMC 723. ADVANCED FELINE MEDICINE. (2 Credits)
A one-week elective for senior students in the DVM curriculum. The course emphasizes aspects of internal medicine specific to the domestic cat. Graded P/N.

VMC 724. LARGE ANIMAL SURGERY. (6 Credits)
Selected surgical techniques and procedures related to equine and food animal species.
Equivalent to: VM 724

VMC 725. PRINCIPLES OF SURGERY. (4 Credits)
A basic course in the principles and techniques of surgery for the professional veterinary student. Lec/lab.
Equivalent to: VM 725

VMC 726. SMALL ANIMAL THERIOGENOLOGY. (1 Credit)
Advanced clinical experience in small animal (canine) reproduction. Graded P/N.
Prerequisites: VMC 783 with C or better

VMC 727. ADVANCED SMALL ANIMAL SURGERY. (2 Credits)
One-week of additional lectures and laboratories to improve surgical skills and acquire more advanced knowledge of specific surgical conditions. Lec/lab. Graded P/N.

VMC 728. SMALL ANIMAL CLINICAL MEDICINE I. (3 Credits)
Clinical medicine training in diseases of food animals and horses; clinical rounds and diagnostic procedures. Lec/lab. Graded P/N.

VMC 729. CLINICAL THERIOGENOLOGY. (1 Credit)
Practical and theoretical training in reproductive management and disorders in all species; routine diagnostic and treatment procedures; clinic rounds.
This course is repeatable for 3 credits.

VMC 731. SMALL ANIMAL EMERGENCY CARE-DOVE LEWIS. (3 Credits)
A two-week clinical rotation at the Dove Lewis Memorial Emergency Clinic in Portland, OR.
Equivalent to: VM 731

VMC 732. CLINICAL LARGE ANIMAL MEDICINE I. (3,6 Credits)
Clinical medicine training in diseases of food animals and horses; clinic rounds and diagnostic procedures.
Equivalent to: VM 732
This course is repeatable for 24 credits.

VMC 733. LARGE ANIMAL SURGERY LABORATORY. (2 Credits)
Apply surgery principles and common surgical procedures of large animal species.

VMC 734. CLINICAL LARGE ANIMAL SURGERY I. (3,6 Credits)
Clinical surgery, treatment, and care of food animals and horses; clinical rounds; training in surgery, lameness, and diagnostic procedures. Lec/lab.
Equivalent to: VM 734
This course is repeatable for 24 credits.

VMC 735. RURAL VETERINARY PRACTICE I. (3,6 Credits)
A one-week course for 4th year veterinary students, with particular interest in gastrointestinal surgery. Graded P/N.

VMC 736. CLINICAL SKILLS IV: PROFESSIONAL COMMUNICATION AND ETHICS. (2 Credits)
Develop communication skills and ethical reasoning for client interactions.

VMC 737. VETERINARY ANESTHESIOLOGY. (4 Credits)
A three-week rotation in veterinary anesthesiology utilizing patients presented to the veterinary teaching hospital.
Equivalent to: VM 737

VMC 738. INTRODUCTION TO ANIMAL CARE. (3 Credits)
Feeding, housing, breeding and marketing systems related to animal care.
Equivalent to: VM 738
This course is repeatable for 6 credits.

VMC 739. VETERINARY MEDICAL ETHICS. (1 Credit)
Introduction of ethics in veterinary medicine, with specific attention to ethical theories, ethical decision making, moral status of animals, professional ethics, and practice issues.
Equivalent to: VM 739

VMC 740. SHEEP AND GOAT MEDICINE AND SURGERY. (3 Credits)
Discussions of economically important sheep and goat diseases, practical surgeries, and a review of nutrition and husbandry. Graded P/N.

VMC 741. LARGE ANIMAL GI SURGERY. (2 Credits)
A one-week course for 4th year veterinary students, with particular interest in gastrointestinal surgery. Graded P/N.

VMC 742. CAMELID MEDICINE AND SURGERY. (4 Credits)
Designed to give students an in-depth introduction to camelid health care via hands-on work, lectures, and discussion sections. Graded P/N.

VMC 744. ADVANCED LAMENESS IN EQUINE. (3 Credits)
Application of anatomy, lameness examination, nerve and joint anesthesia, diagnostic radiology, ultrasound and nuclear scintigraphy to diagnosis of lameness in horses. Graded P/N.

VMC 745. PRACTICE MANAGEMENT. (2 Credits)
A course in basic personal and business finances, career skills, and legal aspects of veterinary practice. Graded P/N.
Equivalent to: VMB 775

VMC 747. VETERINARY ANESTHESIOLOGY II. (3 Credits)
An additional two-week clinical rotation in veterinary anesthesiology utilizing patients presented to the Veterinary Teaching Hospital. Graded P/N.

VMC 748. EQUINE DENTISTRY. (2 Credits)
Utilizing modern, motorized equipment, cadaver specimens, and live hospital and client horses, students will learn and perform modern methods of equine dental prophylaxis and treatment. Graded P/N.
VMC 749. CLINICAL IMAGING II. (3 Credits)
Advanced clinical course for 4th-year veterinary students in which they will assume additional responsibility for performing common radiographic procedures. Graded P/N.
Prerequisites: VMC 796 with C or better

VMC 750. EQUINE CLINICAL NUTRITION. (1 Credit)
A one-week course for veterinary students focusing on equine nutrition that can be used in veterinary practice. Graded P/N.

VMC 751. RUMINANT NUTRITION. (2 Credits)
An advanced course in clinical ruminant nutrition dealing with nutritional problems of ruminants that might be encountered by a practicing veterinarian. Graded P/N.

VMC 752. CLINICAL LARGE ANIMAL MEDICINE II. (3-6 Credits)
Additional clinical medicine training. Graded P/N.
Prerequisites: VMC 732 with C or better
Equivalent to: VM 752
This course is repeatable for 6 credits.

VMC 753. CLINICAL ONCOLOGY I. (2 Credits)
Teaches students a realistic approach to the diagnosis and treatment of pets with cancer. Students will participate in rounds, case management and medical records keeping.

VMC 754. CLINICAL LARGE ANIMAL SURGERY II. (3,6 Credits)
Additional surgical training. Graded P/N.
Prerequisites: VMC 734 with C or better
Equivalent to: VM 754
This course is repeatable for 6 credits.

VMC 755. RURAL VETERINARY PRACTICE II. (3-6 Credits)
One additional rural practice training. Graded P/N.
Prerequisites: VMC 735 with C or better
Equivalent to: VM 755
This course is repeatable for 6 credits.

VMC 756. CLINICAL SKILLS V: TECHNICAL SKILLS AND CLINICAL REASONING. (1 Credit)
Development of technical and psychomotor skills and clinical reasoning in preparation for clinical coursework.

VMC 758. CATTLE PRODUCTION MEDICINE. (3 Credits)
Clinical application of production medicine practices to dairy and beef cattle practice. Graded P/N.
Prerequisites: VMC 735 with C or better
Equivalent to: VM 758

VMC 759. LARGE ANIMAL PALPATION. (1 Credit)
A laboratory for additional experience in rectal palpation of large animals, for third-year veterinary students. Graded P/N.

VMC 760. CLINICAL SKILLS I: INTRO TO ANIMAL CARE AND VETERINARY MED. (3 Credits)
Introduction of a variety of topics relevant to veterinary clinical skills including professionalism, inclusion, ethics, and career options. In addition, animal care, handling, restraint, and physical exam skills will begin to be developed.

VMC 761. CLINICAL SKILLS II: PHYSICAL EXAM AND PROBLEM SOLVING SKILLS. (3 Credits)
Introduction to problem solving and integration of clinical case and basic science in the veterinary curriculum. Development of physical exam skills on healthy animals and medical records keeping.

VMC 762. CLINICAL SKILLS III: REASONING AND COMMUNICATION. (2 Credits)
Develop communication skills and clinical reasoning in preparation for client interactions and evidence-based decision-making.

VMC 763. ADVANCED CLINICAL CARDIOLOGY. (1 Credit)
An elective course for junior veterinary students detailing diagnosis and management of the common congenital and acquired cardiac diseases of domestic animals.

VMC 764. DIAGNOSTIC IMAGING. (4 Credits)
A lecture and laboratory course in diagnostic imaging covering physics or radiography and ultrasonography, radiation safety and image interpretation for small and large animals, presented by body systems.
Equivalent to: VM 764

VMC 765. ADVANCED CLINICAL RADIOLOGY. (1 Credit)
An elective advanced radiology case-based course for Year 3 veterinary medicine students that focuses on radiographic findings of commonly encountered clinical disease.

VMC 766. CLINICAL SMALL ANIMAL ULTRASONOGRAPHY. (2 Credits)
A 1-week overview of clinical small animal ultrasonography with particular emphasis on material relevant to a general or emergency practitioner. Students will be able to perform a FAST scan to identify peritoneal fluid. Students will listen to didactic lectures in the morning with practical sessions in the afternoon. At the end of the week, pairs of students will make a short presentation based on a literature search on a topic of interest.

VMC 767. SMALL ANIMAL ABDOMINAL ULTRASOUND. (3 Credits)
Introductory course to provides instruction in veterinary ultrasound with an emphasis on image optimization, evaluation of the abdomen, description and interpretation of imaging findings in dogs and cats. This course is intended for students with a background in common small animal disease and imaging anatomy.

VMC 768. PRINCIPLES OF ANESTHESIA. (4 Credits)
A basic course in the principles and techniques of surgery and anesthesia for the professional veterinary student. Lec/lab.
Equivalent to: VM 768

VMC 769. GENERAL MEDICINE. (2 Credits)
An introduction to medicine with a discussion of the principles of medicine that would be applicable to all species. Physical examination, clinical diagnosis, pathophysiology of signs of disease in domestic animals, therapeutic principles and diagnostic procedures.
Equivalent to: VM 769

VMC 770. LARGE ANIMAL MEDICINE I. (4 Credits)
The first of three courses in large animal medicine for third-year professional veterinary students covering diagnosis and treatment of domestic large animals.
Equivalent to: VM 770

VMC 771. LARGE ANIMAL MEDICINE II. (4 Credits)
Diagnosis, treatment and control of diseases of large domestic animals, specifically gastrointestinal, hepatobiliary diseases, weight loss, and introduction to production medicine, and some swine diseases.

VMC 772. LARGE ANIMAL MEDICINE III. (4 Credits)
Diagnosis, treatment and control of diseases of large domestic animals, specifically central nervous system, mastitis, musculoskeletal, sudden death, skin, and some swine diseases.

VMC 773. MEDICINE LABORATORY I. (1 Credit)
Laboratory experience for third-year veterinary students concurrent with the large and small animal medicine courses.
VMC 774. MEDICINE LABORATORY II. (1 Credit)
Laboratory experience for third-year veterinary students concurrent with the large and small animal medicine courses.

VMC 775. CLINICAL SMALL SPORTS MEDICINE AND REHABILITATION. (3 Credits)
Clinical training in small animal rehabilitation in the Veterinary Teaching Hospital.

VMC 776. SMALL ANIMAL MEDICINE I. (5 Credits)
A course for veterinary students describing major topics of small animal internal medicine, using both a systems-based approach and a problem-based approach.
Equivalent to: VM 776

VMC 777. SMALL ANIMAL MEDICINE II. (5 Credits)
A course for veterinary students describing major topics of small animal internal medicine, using both a systems-based approach and a problem-based approach.

VMC 778. SMALL ANIMAL MEDICINE III. (5 Credits)
A course for veterinary students describing major topics of small animal internal medicine, using both a systems-based approach and a problem-based approach.

VMC 779. EQUINE SPORTS MEDICINE. (1 Credit)
One-week elective encompassing basic exercise physiology, sports-related injuries, injury rehabilitation, training and nutrition of equine athletes. Graded P/N.
Equivalent to: VM 779

VMC 780. VETERINARY MEDICAL PRECEPTORSHIP. (1-16 Credits)
Theory of practice of veterinary medicine in a non-university situation. Graded P/N.
Equivalent to: VM 780
This course is repeatable for 16 credits.

VMC 781. SEMINAR IN VETERINARY MEDICINE. (1-16 Credits)
Seminars and case discussions on selected topics by students, staff, and others. Graded P/N.
Equivalent to: VM 781
This course is repeatable for 16 credits.

VMC 782. EMERGENCY CARE. (1 Credit)
One-week rotation in the Veterinary Teaching Hospital during non-regular hours. Practice and instruction in caring for critically ill patients.
Equivalent to: VM 782

VMC 783. THERIOGENOLOGY I. (4 Credits)
To present the clinical applications of reproductive physiology, anatomy, embryology, pathology and microbiology in domesticated animals.
Equivalent to: VM 783

VMC 785. SMALL ANIMAL SURGERY. (7 Credits)
A lecture and laboratory course covering the diagnosis, operative methods, and aftercare of common small animal surgical conditions.
Equivalent to: VM 785

VMC 786. ANIMAL BEHAVIOR. (1 Credit)
Diagnosis and treatment of feline, canine and equine problem behaviors including aggression, anxiety, house-soiling and compulsive behaviors.

VMC 787. 3RD YEAR CLINICS. (1 Credit)
An introductory clinical experience for third-year veterinary students.

VMC 788. BUSINESS APPLICATIONS IN PRIVATE SMALL ANIMAL PRACTICE. (1 Credit)
A hands-on elective course exploring the business of small animal general practice in a case-based approach.
This course is repeatable for 2 credits.

VMC 789. PET PRACTICE. (3 Credits)
Additional clinical training in primary care pet practice at a Banfield Pet Hospital. Graded P/N.
This course is repeatable for 6 credits.

VMC 790. CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: VM 790
This course is repeatable for 48 credits.

VMC 791. CLINICAL SMALL ANIMAL MEDICINE. (3,6 Credits)
A clinical rotation in small animal internal medicine at the Veterinary Teaching Hospital. Emphasis will be placed on patient evaluation, diagnosis and treatment of diseases of dogs and cats.
This course is repeatable for 6 credits.

VMC 792. CLINICAL SMALL ANIMAL SURGERY II. (3-6 Credits)
A two-week, three-credit clinical elective rotation in small animal internal medicine at the Veterinary Teaching Hospital. Emphasis will be placed on patient evaluation, diagnosis and treatment of diseases of dogs and cats.
This course is repeatable for 6 credits.

VMC 793. CLINICAL SMALL ANIMAL SURGERY. (3,6 Credits)
Clinical training in small animal surgery in the Veterinary Teaching Hospital.
Prerequisites: VMC 725 with C or better and VMC 785 [C]
This course is repeatable for 6 credits.

VMC 794. OHS SMALL ANIMAL PRIMARY CARE. (4 Credits)
Three-week rotation at OHS to gain experience with an emphasis on surgery, medical case workup, exam room protocol and behavior basics.

VMC 796. CLINICAL IMAGING. (3 Credits)
A clinical course for 4th-year veterinary students in which they will assume primary responsibility for performing common radiographic procedures.

VMC 797. SMALL ANIMAL CRITICAL CARE AND HOSPITAL SERVICE ROTATION. (1 Credit)
A one-week clinical rotation in small animal critical care managing small animal cases in the intensive care unit at the Veterinary Teaching Hospital.

VMC 798. CLINICAL SMALL ANIMAL SURGERY II. (3-6 Credits)
Clinical training in small animal surgery in the College of Veterinary Medicine, Lois B. Acheson Veterinary Teaching Hospital.
This course is repeatable for 6 credits.

VMC 799. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Veterinary Medicine Professional Major (DVM)

State of Oregon DVM Licensing Regulations

Oregon Veterinary Medical Examining Board Requirements
1. Graduate of a veterinary medical school accredited by the AVMA, or if a foreign graduate, have a certificate from ECFVG, PAVE or other equivalency program approved by the board.
2. Passed the NBC/CCT or NAVLE and Juris Prudence exams.
3. If you have less than one year’s U.S. experience, you must obtain an intern permit and practice under the supervision of an Oregon-licensed veterinarian for one year (or the balance of a year).

If you meet the following conditions, you may include a letter requesting a waiver of the CCT. Your letter must cite compliance with each of these requirements:

- Graduate of an accredited veterinary school or earned ECFVG certificate prior to 1991;
- Engaged in five contiguous years of active veterinary clinic practice immediately preceding date of application;
- Have held license(s) in good standing in other US states or provinces since graduation; and
- Have continuing education of at least 10 hours per year during the five years immediately preceding the date of application.

Examinations
Scores must be reported directly to the board from VIVA. If you tested in Oregon, you do not need to request a score transfer.

North American Veterinary Licensing Examination (NAVLE): Administered via computer during two periods in spring and winter. Passing score as established by National Board Examination Committee.

NBE/CCT: Passing score before December 1992 is 75.00 based on 1.5 standard deviations. After December 1992, passing score is the criterion-referenced score of 425.

Jurisprudence Exam: An open-book 40-question test on veterinary laws and rules of Oregon. The exam and regulations will be sent to applicants upon receipt of the license application and $75 fee. A passing score of 95 percent (38 correct answers) is required.

Licensing
Complete and submit the application and fee. The Jurisprudence Exam will be sent to you to complete and return. When you pass the JP exam, you will be sent an activation form. You may not practice in Oregon until you activate your license or intern permit. Complete and send in the activation form, along with the $100 fee. Your permanent license or intern permit will be issued upon receipt of all necessary documentation.

Permanent Licenses: If you have at least one year’s documented veterinary clinical experience, you may activate your permanent license.

Intern Permits: New graduates or veterinarians with less than one year’s experience must obtain an intern permit. This permit expires one year after the date of issue or less if prior experience is documented. Renewal notices are sent approximately six weeks prior to expiration date, at which time interns may activate their permanent license or request another intern permit if one year’s experience has not been acquired. Current veterinary school seniors may submit application materials prior to graduation; however an intern permit will not be issued until the board receives either a dean’s letter confirming graduation or a diploma copy.

Continuing Education: Active licensees are required to report 30 credits of CE every odd year, i.e., ’11, ’13, ’15, etc.

Major Code: 9970

Preveterinary Curriculum
Typical preveterinary curriculum at Oregon State University follows. Oregon State University courses that will meet the preveterinary academic requirements:

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* Baccalaureate Core Course (BCC)

Professional Curriculum DVM Degree

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Veterinary Medicine Professional Major (DVM)

Spring
- VMB 713 VETERINARY GROSS ANATOMY 4
- VMB 719 VETERINARY PHYSIOLOGY 4
- VMB 720 VETERINARY IMMUNOLOGY 5
- VMB 721 VETERINARY PATHOLOGY 5
- VMC 720 VETERINARY CLINICAL NUTRITION 2

Second Year
Fall
- VMB 750 SYSTEMIC PATHOLOGY I 4
- VMB 753 VETERINARY VIROLOGY I 4
- VMB 759 VETERINARY BACTERIOLOGY AND MYCOLOGY 5
- VMB 760 VETERINARY PARASITOLOGY 5
- VMB 761 VETERINARY PHARMACOLOGY 2

Winter
- VMB 751 SYSTEMIC PATHOLOGY II 5
- VMB 762 VETERINARY PHARMACOLOGY II 4
- VMC 764 DIAGNOSTIC IMAGING 4

Spring
- VMB 742 VETERINARY INTEGRATED PROBLEM SOLVING 1
- VMB 765 VETERINARY TOXICOLOGY 4
- VMB 766 EPIDEMIOLOGY AND PUBLIC HEALTH 3
- VMC 725 PRINCIPLES OF SURGERY 4
- VMC 739 VETERINARY MEDICAL ETHICS 1
- VMC 768 PRINCIPLES OF ANESTHESIA 4
- VMC 769 GENERAL MEDICINE 2

Third Year
Fall
- VMC 770 LARGE ANIMAL MEDICINE I 4
- VMC 773 MEDICINE LABORATORY I 1
- VMC 776 SMALL ANIMAL MEDICINE I 5
- VMC 783 THERIOGENOLOGY I 4
- VMC 785 SMALL ANIMAL SURGERY 7

Winter
- VMC 724 LARGE ANIMAL SURGERY 6
- VMC 771 LARGE ANIMAL MEDICINE II 4
- VMC 774 MEDICINE LABORATORY II 1
- VMC 777 SMALL ANIMAL MEDICINE II 5
- VMC 786 ANIMAL BEHAVIOR 1

Spring
- VMB 728 SPECIAL ANIMAL MEDICINE 4
- VMB 745 COMMUNICATIONS FOR VETERINARIANS 1
- VMC 772 LARGE ANIMAL MEDICINE III 4
- VMC 778 SMALL ANIMAL MEDICINE III 5
- VMC 787 3RD YEAR CLINICS 1

Fourth Year
- Select one of the following paths:
  - Small Animal Focus Path Required Blocks
  - Large Animal Focus Path Required Blocks
  - General Focus Path Required Blocks

Non-Traditional Focus Path Required Blocks

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General Focus Path Required Blocks

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Total Hours
- 219-239
- 55-60

Electives must be approved by associate dean

Total Hours
- 58

Additional electives required (3rd and 4th year)
- 7

Total Hours
- 55
Non-Traditional Focus Path Required Blocks
Electives must be approved by associate dean

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Additional electives required (3rd and 4th year) 7

Total Hours 60

Graduate School
Graduate students at Oregon State University can choose from 59 doctoral programs, over 100 master's programs and 15 certificate programs. Listed as a "Very High Research Activity (R1)" institution by the Carnegie Classification of Institutions of Higher Education, Oregon State offers students tremendous opportunities for research and career development beyond their undergraduate degrees.

Prestigious programs
Several of our academic units claim top twenty, and even top ten, rankings in the world including Forestry (#3), Oceanography (#3), Mycology (#8), Marine Biology (#8) and Agricultural Sciences (#13). Our top rankings in the United States include Robotics (#4), Natural Resources (#4) and Big Data (#10). Join Oregon State as a graduate student and you will become an integral part of a growing, dynamic, creative and collaborative top-tier institution.

A diverse student body
Our 4,500 graduate students come from over 70 countries and every state in the US. Almost 20% of graduate students are from outside the US. Oregon State's seven cultural resource centers (https://culturalresourcecenters.oregonstate.edu/) help give students a place, and a community, to connect with once they arrive on campus, especially for those who may be far from home. The cultural centers include the Asian & Pacific Cultural Center, the Lonnie B. Harris Black Cultural Center, the Centro Cultural César Chávez, the Ettihad Cultural Center, the Native American Longhouse Eena Haws, the Pride Center, and the Women & Gender Center.

Services by the Graduate School
The Graduate School provides essential services to students and programs including where you apply to become a student at Oregon State and registering your important academic milestones such as your program of study, committee members, oral prelims, final exams, and graduation. Familiarize yourself with the Graduate School's website (https://gradschool.oregonstate.edu/) where you will find relevant information for future and current students.

Interdisciplinary programs at the Graduate School
Similar to the 11 academic colleges at Oregon State, the Graduate School is also the academic home for several interdisciplinary programs and the students enrolled in those programs. These programs are unique in their ability to offer an education and training in topic areas spanning multiple colleges and disciplines.
Policies Governing All Graduate Programs

Graduate Major

A graduate major is the area of academic specialization in which the student chooses to qualify for a graduate degree. Upon completion of a graduate degree, the degree awarded and the graduate major are listed on the student’s transcript.

Graduate Option

Options are for students of a specific major. An option is one of several distinct variants of course aggregations within a major that focus on an area of study designed to provide a student with specialized knowledge, competence, and skills while sharing a minimum core of courses.

A graduate option consists of a minimum of 12 designated quarter credits of related course work (excluding thesis credits), comprised of course work offered by the sponsoring unit as well as by other academic units. The option may be comprised of specific courses, completion of a designated number of credits from a longer list of alternative courses, or a combination of specific and alternative course lists. Approved options may be added to a graduate program of study, and approved by the faculty advisor(s) and the director of the sponsoring unit. On the program of study, there should be no overlap in course credits between options (the same course cannot be used to satisfy credit requirements in multiple options). When the unit submits the final examination card to validate awarding of the major to the Graduate School, the unit will also validate that the requirements of the option have been completed.

Graduate Area of Concentration

A graduate area of concentration is a subdivision of a major or minor in which a strong graduate program is available. Areas of concentration may be referenced on the student’s program of study, but they are not listed on the student’s transcript.

Graduate Minor

A graduate minor is an academic area that clearly supports the major. Master’s program minors must include a minimum of 15 quarter credits of graduate course work; doctoral minors require a minimum of 18 credits. On a master’s or doctoral program, a minor may be:

1. an academic area available only as a minor,
2. a different major,
3. the same major with a different area of concentration, or
4. an integrated minor.

An integrated minor consists of a series of cognate courses from two or more areas. These courses must be outside the major area of concentration, with most of the courses being outside the major department. The graduate faculty member representing the integrated minor must be from outside the major department. Graduate minors are listed on the student’s transcript.

Concurrent Master’s Degrees

Students who earn two master’s degrees at Oregon State University must complete all degree requirements for each degree. This requires filing separate programs of study forms for each degree, filing separate commencement applications for each degree, completing separate projects or theses for each degree, scheduling separate final oral examinations for each degree, and passing final oral examinations for each degree. For additional information, please refer to the Transfer Credit section of this catalog.

Dual Majors

For the M.A., M.S., EdM, MF, or Ph.D. degree, a student may select two graduate major areas to pursue instead of the traditional single major. Only one degree is awarded, and the student basically must satisfy all degree requirements for majors in both areas. For more details, contact the Graduate School.

Graduate Certificate

A graduate certificate program is a structured progression of graduate-level courses that constitute a coherent body of study with a specific defined focus within a single discipline or a logical combination of disciplines. It is designed for a student who has completed a baccalaureate degree and is in pursuit of advanced-level learning. Graduate certificates reflect the educational mission of the university.

Transfer Credit

Students may only transfer course credits from regionally accredited institutions (or equivalently recognized institutions outside the U.S.). Students who wish to transfer graduate credits from other schools must provide transcripts for courses already completed to the Graduate School prior to the submission of a study program. Undergraduate students at OSU may receive credit for graduate courses (500 and 600 level) in excess of the requirements for a baccalaureate degree. Graduate courses taken at OSU while the student was a non-degree graduate student, a post-baccalaureate student, a professional degree-seeking student (PharmD or DVM), or an undergraduate student, are considered transfer courses.

Courses to be transferred must be graduate level. It is the responsibility of the student wishing to transfer the course to provide the necessary documentation to satisfy the OSU guidelines.

All courses on a program of study require final approval by the student’s program of study committee and the Graduate School. Committees are free to deny inclusion of any course, if they believe that the earned grade is not sufficient; the course is not appropriate, sufficiently current, sufficiently rigorous based on syllabus content; or for any other reason. To be considered for inclusion on a graduate program of study, OSU courses whether taken as either an enrolled graduate student or pre-graduate admission, must have an earned grade of C or better. To be considered for inclusion on a graduate program of study, courses from another institution (transfer courses) must have an earned grade of B minus or better.

If the transfer credit is from a foreign university, the student must provide copies of the original transcript and an English translation of the transcript, with the courses to be transferred clearly indicated. Grades and credits for the courses must be clearly identified. In some countries, the first university degree, which OSU considers to be equivalent to a baccalaureate degree, may take five years or more to complete. All of the course work toward such a degree is considered a requirement for the first university degree, and hence none of it can be transferred to a graduate certificate or graduate degree at OSU.

Students may not transfer courses graded on a nonstandard basis (e.g., Pass/No Pass, Credit/No Credit, Satisfactory/Unsatisfactory) to their graduate certificate or degree programs unless it can be verified from the registrar of the university offering the course that the grade is equivalent to a B minus or better.
Graduate courses to be transferred from another institution to an OSU master's degree must not have been used to satisfy the requirements for a bachelor's degree, master's degree (or equivalent) or a doctoral degree.

Graduate courses to be transferred from an OSU master's degree to a second OSU master's degree must meet the following three requirements:

1. Credits used to satisfy the residency requirements of one master's degree may not be used to satisfy the residency requirements of another master's degree.
2. Students who earn two master’s degrees at Oregon State University must complete all degree requirements for each degree. This requires filing separate programs of study forms for each degree, filing separate commencement applications for each degree, completing separate projects or theses for each degree, scheduling separate final oral examinations for each degree, and passing final oral examinations for each degree.
3. Such credit will be granted only for graded course work earned at Oregon State University and completed with a grade of C or higher.

Up to 15 graduate credits may be transferred toward a 45-credit master's degree. Up to 6 graduate credits may be transferred toward an 18-credit graduate certificate.

Graduate courses to be transferred to a doctoral degree program can be courses that were used to satisfy the graduate course requirements for a graduate certificate or a master's degree (or equivalent). Selected 700-level courses that have been deemed equivalent to graduate-level learning may be used on doctoral programs of study upon approval of the student's graduate committee. There is no limit on transfer credit toward the doctoral degree as long as the doctoral residence requirement is satisfied.

Credits earned in fulfillment of a graduate certificate program may be applied to a graduate degree, so long as they meet the appropriate standards for use in the degree and the criteria to transfer credit as defined herein. Courses completed for a degree program may likewise be applied toward a certificate program.

**Preparation Required for Graduate Major**

Preparation for a graduate major is ordinarily an undergraduate major in the same subject, or a fair equivalent. Preparation for a graduate minor is ordinarily at least one year of upper-division work in addition to foundation courses in the subject.

Academic performance is not the sole criterion for admission to and continuation in certain courses and programs at the university, such as practicum courses and internships. The university may find it necessary to evaluate a person's background to determine his or her likelihood of maintaining standards of professional conduct necessary in the academic discipline or profession. An evaluation may consider current performance as well as past experiences and actions that could affect a student's ability to perform in the particular course or program.

**Qualifying Examinations**

Some departments and programs require graduate students working for advanced degrees to take oral and/or written examinations in their major and minor fields to determine overall preparation and background. The examination serves as a guidance examination, the results of which are used in setting up the graduate study program. A poor showing in any area may result in a student's taking undergraduate courses without graduate credit to gain the necessary background to proceed with the graduate program. The examination usually is taken during the first quarter of graduate enrollment.

In lieu of their own qualifying examination, departments and programs may accept a satisfactory showing in the Graduate Record Examination (GRE), or some other standardized test. Check with the anticipated major department or program to find out which exams are appropriate.

**Registration Requirements**

**Introduction**

Full-time status as a graduate student is defined by Oregon State University as enrollment in 9 credits per term. The maximum load for a full-time graduate student is 16 credits. A student may exceed this limit only with the approval of the Graduate School. Students receiving approval to exceed 16 credits will be assessed a per-credit overload fee.

Full-time status (i.e., a minimum of 9 credits per term) may not be sufficient to qualify for purposes of veterans' benefits, visa requirements, external fellowships, and federal financial aid.

Federal regulations require that enrollment statuses are defined for short-term courses for the purpose of distributing VA education benefits. Enrollment statuses in short-term classes (e.g., short-term summer term classes) for this purpose are defined per the table below.

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To assure full compliance with visa regulations, international students must consult with the Office of International Services (http://international.oregonstate.edu/ois/) (OIS) for additional information about registration requirements.

**Continuous Enrollment**

1. **Minimum Registration**

    Unless on approved leave of absence (see Section II), all graduate students in graduate degree programs must register continuously for a minimum of 3 graduate credits until their degree is granted or until their status as a credential-seeking graduate student is terminated. This includes students who are taking only preliminary comprehensive or final examinations or presenting terminal projects. Students must register for a minimum of 3 graduate credits and pay fees if they will be using university resources (e.g., facilities, equipment, computing and library services, or faculty or staff time) during any given term, regardless of the student's location. If degree requirements are completed between terms, the student must have been registered during the preceding term.

Graduate students who have successfully completed all course and non-course requirements in accordance with diploma deadlines (see the Graduate School website) are not required to register during the subsequent term.
Nonthesis master's degree students who complete all degree requirements during a term for which they are registered will not be required to register for the subsequent term.

Doctoral and thesis master's students who fail to meet all deadlines and complete all course and non-course requirements during the term will be required to register for a minimum of 3 graduate credits during the subsequent term. However, only if library copies of the thesis have been submitted to the Graduate School within the first two weeks of the subsequent term and the thesis is the only outstanding requirement remaining for certification of the student's graduate degree may an exception to this rule be considered.

Graduate students who use facilities or faculty/staff time during summer session to engage in academic or research activities in support of their thesis/pursuit of degree are required to register for a minimum of 3 credits during the summer session. Graduate students who use facilities or faculty staff time during summer session purely in service to the university and not to engage in academic or research activities in support of their thesis/pursuit of degree are not required to register during the summer session.

Graduate students do not need to submit a Leave of Absence form if they do not enroll in summer term.

It should be noted that graduate assistantship eligibility requires enrollment levels that supersede those contained in this continuous enrollment policy. Various agencies and offices maintain their own registration requirements that also may exceed those specified by this continuous enrollment policy (e.g., those of the Veterans Administration, Immigration and Naturalization Service for international students, and those required for federal financial aid programs.) Therefore, it is the student's responsibility to register for the appropriate number of credits that may be required for funding eligibility and/or compliance as outlined by specific agency regulations under which they are governed.

2. Leave of Absence

On-leave status is available to students who need to suspend their program of study for good cause. Students who desire a leave of absence will work with their major professor, program administrator, and the Graduate School to arrange authorized leave. Students understand that while on leave they will not use university resources. Graduate faculty members are students’ most important resource at the university and will work closely with graduate students to ensure timely completion of academic goals, understanding of the continuous graduate enrollment policy, and that graduate students enroll each term other than when they are on authorized leave. The Graduate School will assist graduate students and graduate faculty members with administrative procedures related to the continuous graduate enrollment policy. The Graduate School recognizes the diverse circumstances and unpredictability of graduate students’ lives and will work in partnership with the graduate community in arranging leaves and responding to unanticipated situations.

A graduate student intending to resume active graduate student status following interruption of his or her study program for one or more terms, excluding summer session, must apply for leave of absence to maintain graduate student standing in his or her degree program. (See Section IV below). Leave of Absence (https://gradschool.oregonstate.edu/forms/#resume) form must be received by the Graduate School at least 15 working days prior to the first day of the term involved. The time the student spends in approved on-leave status will be included in any time limits relevant to the degree (See Sections C.1. and C.2. below). Students in on-leave status may not a) use any university facilities, b) make demands upon faculty time, c) receive a fellowship or financial aid, or d) take course work of any kind at Oregon State University.

a. Eligibility

Only graduate students in good standing are eligible for leave of absence.

Leave of Absence Categories

i. Regular Leave of Absence is granted on a term-by-term basis in cases where the student demonstrates good cause (e.g., illness, temporary departure from the university for employment, family issues, financial need, personal circumstances). Students who request a leave of absence must:

1. be in good standing,
2. submit the Leave of Absence form (https://gradschool.oregonstate.edu/forms/#resume) indicating each term for which leave is requested, and
3. complete all degree requirements within the time limits established in this catalog.

ii. Family and Medical Leave. This leave is different from regular leave in that it is for 12 continuous weeks that may span multiple terms and must meet FMLA leave requirements as determined by the Office of Human Resources. Find the Family and Medical Leave policy. (https://gradschool.oregonstate.edu/forms/#resume)

b. Limits

i. Regular Leave of Absence is granted for a specified time period that may not exceed three terms, excluding summer session.

ii. Time spent in on-leave status will be included in all time limits pertaining to the student's degree program.

iii. Students who matriculate fall term 2016 or later may use unlimited leaves as long as time to degree constraints are met (7 years for master’s degrees and graduate certificates; 9 years for doctoral degrees). Leaves of absence may be approved for up to three terms at a time, but must be renewed to retain student status. Failure to renew the leave of absence or register will result in the loss of student status.

iv. Family and Medical Leave is available for 12 continuous weeks that may span multiple terms and must meet FMLA leave requirements as determined by the Office of Human Resources. These absences will not be included in time limits pertaining to the student's degree program. Contact the Graduate School for additional details.

c. Approval

Approval of the major professor, department/program chair, and graduate dean are required.

d. Student Fees

Students with approved on-leave status are not required to pay tuition or fees. However, students who must register as per section I, ‘Minimum Registration,’ must pay both tuition and student fees.

3. Unauthorized Break in Registration

A graduate student who takes an unauthorized break in registration by failing to maintain continuous enrollment or by failing to obtain a leave of absence will relinquish his or her graduate standing in the university. Students who wish to have their graduate standing reinstated will be required to apply for readmission and pay the application fee. The readmission application must be approved by
the student's major professor, department/school/program chair, and graduate dean. Acceptance back into a graduate program is not guaranteed even if the student departed in good standing. The petitioner for readmission will be required to meet university and departmental admission requirements and degree completion requirements that are in effect on the date of readmission. Review of the Application for Graduate Readmission may also result in a change of residency status from resident to nonresident.

4. **Appeal**
   
   In the case of extraordinarily extenuating circumstances, students may appeal the provisions of the continuous graduate enrollment policy by submitting a detailed request in writing to the dean of the Graduate School.

**Implementation of Continuous Enrollment Policy**

All graduate students, excluding certificate-only students, including those enrolled prior to fall 2002, are subject to this policy.

All graduate students should be enrolled for a reasonable number of credits sufficient to represent their use of university space, facilities or faculty time.

**Registration Requirements for Graduate Assistants**

In addition to the above registration requirements, the following requirements apply to graduate teaching assistants (GTA) and graduate research assistants (GRA).

As a condition of their academic appointments, graduate teaching and research assistants are required to register for 3 credits above the minimum full-time load (i.e., a minimum of 12 credits) each term of the appointment during the academic year (fall, winter, and spring.) During summer session, a minimum registration of 3 credits is required for graduate assistants. Students are responsible for determining whether the minimum 3-credit summer registration fulfills their individual immigration, financial aid, tax liability or other specific needs. Audit registrations, course withdrawals, and enrollment in INTO OSU courses may not be used to satisfy enrollment requirements for graduate assistant salary/stipend, tuition remission, salary supplement or health insurance benefits. Tuition charges associated with INTO OSU enrollment are not covered under graduate assistant tuition remission.

**Grade Requirement**

A grade-point average of 3.00 (a B average) is required: 1) for all courses taken as a degree-seeking graduate student, and 2) for courses included in the graduate degree or graduate certificate program of study. Grades below C (2.00) cannot be used on a graduate program of study. A grade-point average of 3.00 is required before the final oral or written exam may be undertaken. Enforced graduate-level prerequisite courses must be completed with a minimum grade of C.

**Policy on Disallowance of Undergraduate Courses in the Calculation of the Final Graduate Student GPA**

Calculation of the final cumulative GPA for graduation for a graduate student will include all 500-, 600- and certain 700-level courses determined to be eligible for use on a graduate program of study. Undergraduate (100 to 400 level) courses taken, even if taken while a graduate student, will not be used in the cumulative GPA calculation for graduation. A graduate student is required to attain a 3.0 GPA in all graduate-level course work, both cumulatively and on the program of study, for graduation.

**Course Numbers**

**Graduate Courses**

All graduate courses will be designed around well-defined objectives or student learning outcomes, and instructional opportunities should be designed to help students achieve these outcomes. Student learning outcomes encompass the range of student attributes and abilities that students should be able to demonstrate after successful completion of the course.

**500-Level Courses**

These courses are graduate courses offered primarily in support of graduate certificate or master's degree programs but which are also available for use on doctoral level degree programs. Undergraduates of superior scholastic achievement may be admitted to these courses on the approval of the instructor, and they may, if admitted, under some conditions, use a limited number of these courses toward a graduate certificate or a graduate degree program. These courses have one or more of the following characteristics:

1. They require upper-division prerequisites in the discipline.
2. They require an extensive theoretical base in the discipline.
3. They increase or re-examine the existing knowledge or database of the discipline.
4. They present core components or important peripheral components of the discipline at an advanced level.

**600-Level Courses**

These are advanced professional or technical courses that may be applied toward a first professional degree (e.g., DVM, PharmD). They make up the bulk of the course work for these professional degree programs. In general, these courses are not considered graduate-level courses, and may not be applied toward graduate certificate, master's level or doctoral level (PhD or EdD) degree programs. However, selected 700-level courses that have been deemed equivalent to graduate-level learning may be used on doctoral programs of study upon approval of the student's graduate committee and the Graduate School.

**700-Level Courses**

These are advanced professional or technical courses that may be applied toward a first professional degree (e.g., DVM, PharmD). They make up the bulk of the course work for these professional degree programs. In general, these courses are not considered graduate-level courses, and may not be applied toward graduate certificate, master's level or doctoral level (PhD or EdD) degree programs. However, selected 700-level courses that have been deemed equivalent to graduate-level learning may be used on doctoral programs of study upon approval of the student's graduate committee and the Graduate School.

**800-Level Courses**

These are in-service courses aimed at practicing professionals in the discipline. These courses have an in-service or retraining focus, and provide the professionals new ways to examine existing situations or new tools to treat existing problems. These courses generally have none of the characteristics of 500-level courses. They are not graduate-level courses, and they may not be applied to graduate certificate or graduate degree programs nor to professional degree programs.

**Blanket-Numbered Courses**

Blanket-numbered courses have a zero middle digit. Those that carry graduate credit may be repeated up to the maximum totals indicated below.

- **Research** (501 or 601) is for research that is not part of the thesis. Data obtained from such research should not be incorporated into the thesis.
The Thesis (503 or 603) covers the thesis research and writing. A student may register for thesis credit each term.

Reading and Conference (505 or 605) and Projects (506 or 606) are used for special work not given under a formal course number.

Seminar (507 or 607) is used both for departmental seminars and for special group work not given in a formal course.

Workshop (508 or 608) is usually a special, short-term course covering a variety of topics.

Practicum (509) is used for courses whose emphasis is the application of academic theory to the work environment.

No more than 9 credits of blanket-numbered courses, other than thesis (or research-in-lieu-of-thesis for nonthesis programs), may be applied toward the minimum 45-credit master's degree. While internship credit (510) is not considered a blanket-numbered course, no more than 6 credits of internship may be applied toward a 45-credit master's degree. The internship credit limit is in addition to the 9-credit blanket-hour limit.

No more than 15 blanket-numbered credits may be applied toward the minimum 108-credit doctoral program.

No more than 3 credits of blanket-numbered courses in each field of study may be used in the MAIS program; thesis credits or research paper credits are exempt from this limitation.

Blanket-numbered transfer courses will count toward the maximum totals specified above.

Courses Graded on Nonstandard Basis
Graduate students may elect to take courses on an S/U basis only if those courses are not in their graduate certificate or graduate degree program or are not required for the removal of deficiencies. Graduate students may use courses taken at OSU on a P/N basis in their graduate certificate or graduate degree programs.

4xx/5xx Courses
No more than 50% of courses used for a graduate program of study may be the 500-level component of a dual-listed course. Courses bearing dual-listed numbers (400/500) must provide students who are enrolled for 500-level credit with graduate-level learning.

Expectations for learning outcomes in the graduate component of dual listed (400/500 level) courses are the same as for stand-alone 500-level courses. A distinction should be made between learning outcomes for students taking the course for undergraduate credit (400 level) and those taking the course for graduate credit (500 level). In most cases this distinction should include emphasis on developing skills in analysis, synthesis, and/or evaluation for the 500-level credit. The different student learning outcomes should be accompanied by appropriate differences in instructional opportunities and evaluation procedures.

Repeating 4xx/5xx Courses
A graduate student who has taken a 4xx course may not normally include the corresponding 5xx course on his or her graduate program.

Remote Access for Graduate Committee Meetings
It is generally expected that all members of graduate committees should be physically present at all required graduate committee meetings (i.e., program meetings, preliminary examinations, and final examinations). However, it is permissible for the student, and/or committee members to participate from a remote location provided the conditions listed below are met:

1. Advance agreement of the student and all committee members has been obtained;
2. All participants join in with two-way audio and video connections; audio-only connections must be approved by the major professor if the video connection is not possible. When the student is the remote participant, his or her connection must be an audio and video connection;
3. Any visual aids or other materials have been distributed in advance to the remote participants;
4. The committee members participate in the complete meeting, discussion, presentation, and evaluation; and
5. The student is responsible for making arrangements.

Petitions
A student wishing to deviate from normal Graduate School regulations and procedures may submit a request and the reasons for it to the Graduate School in a letter signed by the student and his or her major professor. In reaching a decision, the Graduate School may seek advice from the Graduate Council. The student will be advised of the decision when it has been made. Action taken on a petition will not be considered precedent for future action.

Diploma Application
Graduate students wishing a printed diploma must complete a Diploma Application form (https://gradschool.oregonstate.edu/forms/). This form should be submitted prior to taking the final examination, indicating the term the student intends to graduate. Participation in Commencement ceremonies requires earlier submission of this form.

Institutional Review Board Approval of Human Subjects Research
It is Oregon State University policy that the OSU Institutional Review Board (IRB) must review all research that involves human subjects. The results from studies conducted without obtaining IRB review and approval may not be published or widely distributed, nor can such data be used to satisfy master’s thesis or doctoral dissertation requirements.

The requirements for IRB review of research involving human subjects is based upon research ethics and federal law, and the implications of conducting human subjects research without IRB approval are significant. Failure to follow this policy places both the individual and the institution at risk: the individual may be subject to university sanctions and/or incur personal liability for negligence and harm; the university could lose access to federal funding or be forced to cease all human subjects research. For more information, please send an email to irb@oregonstate.edu or visit the IRB website. (https://research.oregonstate.edu/irb/)

Institutional Animal Care and Use Committee IACUC
The Oregon State University Institutional Animal Care and Use Committee (IACUC (http://research.oregonstate.edu/iacuc/)) requires prior review and approval for all live vertebrate animal use in research, teaching, testing, per the IACUC Scope of Work Policy (http://research.oregonstate.edu/iacuc/policies-guidelines/). An eligible principal investigator must be identified in order to submit an ACUP to the committee, per PI Eligibility Policy. (https://research.oregonstate.edu/iacuc/policies-guidelines/) Review leading to approval is accomplished via submission of an Animal Care and Use Protocol form (ACUP (http://research.oregonstate.edu/iacuc/iacuc-forms/)) to the IACUC.
The requirements for IACUC review are based on the ethics of animal use, and our assurances to agencies that provide federal oversight, funding, and program accreditation. Implications regarding conduct of animal research without IACUC approval and oversight are significant. Failure to secure and maintain approval can result in the student’s inability to continue research or publish data. In addition, OSU could lose accreditation, lose access to funding and/or be required to pay significant fines. Please contact APOffice@oregonstate.edu for more information.

**OSU Scientific Diving and Scientific Boating**

**Scientific Diving**
Oregon State personnel (graduate or undergraduate students, faculty, staff, approved volunteers) who work underwater as a part of their research must have their diving activity pre-approved by the OSU Diving and Small Boat Safety Officer (DBSO) and the OSU Diving Control Board. OSU is an organizational member of the American Academy of Underwater Sciences (AAUS) (https://www.aaus.org/) and all OSU scientific diving is conducted in accordance with AAUS standards. For more information visit the diving website (https://research.oregonstate.edu/diving/) or contact the Diving and Small Boat Safety Office (diving.safety@oregonstate.edu).

**Scientific Boating**
OSU personnel (graduate or undergraduate students, faculty, staff, approved volunteers) who operate vessels (motorboats, personal watercraft, and non-motorized craft) as a part of their research must conduct their activities in accordance with OSU scientific boating standards. For more information visit the boating website (https://research.oregonstate.edu/boating/) and contact the Diving and Small Boat Safety Office (diving.safety@oregonstate.edu) to ensure that your planned research boating activities are in compliance with OSU standards. OSU is a member of the Scientific Boating Safety Association (SBSA). (http://scientificboating.org/)

**Graduate Work by Faculty Members**
The Faculty as Student policy specifies that one may not simultaneously be an Oregon State University faculty member and an OSU graduate student. This policy pertains to all OSU faculty members (both ranked and professional), is consistent with practices at most universities, and is in keeping with recognized appropriate graduate education practice.

Although faculty members are eligible to enroll for courses at staff fee rates, such course work may not be applied to a graduate certificate or graduate degree without prior approval from the graduate dean.

**Graduate Student Teaching**

**Appointment as Instructor of Record.** For a graduate student to be appointed as the Instructor of Record for a graduate course (including the 500-level component of a slash course):

- The unit/program of employment must be separate and distinct from the unit/program of enrollment.
- The instructor must be appointed to the graduate faculty based on their academic/professional qualification by the unit/program of employment.
- In the event that graduate students from the instructor’s unit/program of enrollment are enrolled in the course, alternative arrangements must be made for evaluating the work of those graduate students.

**Appointment as Teaching Assistant.** For a graduate student to be appointed as the Teaching Assistant for a graduate course (including

OSU, and CGE.

Persons interested in assistantships should write directly to the department/program concerned.

To qualify for appointment as a graduate assistant the student must:

1. Be a regularly admitted, conditionally admitted, or provisionally admitted graduate student at Oregon State University (i.e., not a graduate nondegree-seeking, post-baccalaureate student, or PharmD or DVM student).
2. Be enrolled as a full-time degree-seeking graduate student at Oregon State University, completing a minimum of 12 credits of instruction each term (3 credits during summer session). Audit registrations, course withdrawals, and enrollment in INTO OSU may not be used to satisfy these minimum enrollment requirements.
3. Be making satisfactory progress toward an advanced degree.

Graduate assistants may be appointed on an academic term basis, an academic-year basis (nine months) or a full-year basis (12 months). No appointment can be for less than .30 FTE or more than .49 FTE per term. A graduate assistant on less than .49 FTE may take on extra duties; however, the total stipend plus salary from all sources at Oregon State University may not exceed the equivalent of .49 FTE for any term.

All graduate assistants are required to provide duties to OSU to justify their stipends. Teaching assistants are expected to provide duties related to the university’s instructional program (e.g., teaching laboratories or discussion sections, grading papers, advising). Research assistants provide duties related to the research function of the university. Whatever the type of appointment, the graduate assistant should be regarded as a student providing service as part of a learning experience rather than as an employee whose education is secondary.

The work schedule and the duties to be performed by the graduate assistant shall be established by the department or program sponsoring the assistantship.

Graduate assistants must register for and complete a minimum of 12 credits of instruction each term except during summer session, when a minimum of 3 credits is required. Audit registrations, course withdrawals, and enrollment in INTO OSU courses may not be used to satisfy these
minimum enrollment requirements. (See section on ‘Registration Requirements for Graduate Assistants’ for complete details.)

Persons interested in assistantships should write directly to the department or program concerned.

**International Graduate Teaching Assistant English Language Requirement**

If the Graduate School determines that an applicant or current student’s native language is not English, the proposed IGTA is required to take the Internet Based TOEFL (iBT) test before being appointed as a graduate teaching assistant.

Potential IGTA scoring below 22 on the speaking section of the iBT can be appointed, but will be required to undertake further English language training.

If a department wishes to offer a student with an iBT speaking score of 18 to 21 an assistantship, the unit must:

1. Affirm that the graduate student will be enrolled in IEPA 098NC Communication for IGTA (with the unit paying the cost of this training).
2. If at all possible, assign the graduate student assignments (such as paper grading, reagent preparation, etc.) that do not require personal contact with undergraduate students.
3. If (b) above is not possible, and if possible, pair the IGTA in the laboratory or classroom with another TA who is a native speaker of English.
4. Monitor the quality of IGTA performance using student evaluations and the evaluations of the supervising professors. The unit will document for each student the results of their evaluation of the student’s performance as a GTA.

If the unit agrees to meet these conditions, the IGTA appointment can be made.

The scheduling of IEPA 098NC will be coordinated with the units so that students can attend the course and conduct teaching assistantship duties. Please check the online schedule of classes (https://classes.oregonstate.edu/) for confirmation of the time and date.

**Students with an iBT speaking score of less than 18 cannot be assigned teaching assistantships.**

**Students Who Fail to Find a Major Advisor**

There are times when students are making satisfactory academic progress, but are unable to complete graduate studies with their initial major professor. Oregon State University has an ethical responsibility to assist such students in identifying a new major professor. The Graduate Council and Faculty Senate policy for establishing major advisors and committees for students in this situation provides guidance and can be obtained by contacting the Graduate School.

**Dismissal from Graduate School**

Advanced-degree students (regularly, conditionally, and provisionally admitted) are expected to make satisfactory progress toward a specific academic degree. This includes maintaining a GPA of 3.00 or better for all courses taken as a graduate student and for courses included in the graduate program, meeting departmental or program requirements, and participating in a creative activity such as a thesis.

If a student is failing to make satisfactory progress toward an academic degree, as determined by the major department/program or the Graduate School, the student may be dismissed from the Graduate School.

Any doctoral student who fails the preliminary oral examination with a committee recommendation that the student’s work toward this degree be terminated may be dismissed from the Graduate School.

Any student who fails a final oral examination may be dismissed from the Graduate School.

Academic dishonesty and other violations of the Student Conduct Code (https://studentlife.oregonstate.edu/studentconduct/) may serve as grounds for dismissal from the Graduate School.

**Student Conduct Regulations**

Graduate students enrolled at Oregon State University are expected to conform to basic regulations and policies developed to govern the behavior of students as members of the university community. The regulations have been formulated by the Student Conduct Committee, the Student Activities Committee, the university administration, and the State Board of Higher Education. Violations of the regulations subject a student to appropriate disciplinary or judicial action. The regulations and the procedures for disciplinary action and appeal are available via the Office of Student Conduct and Community Standards website. (https://studentlife.oregonstate.edu/studentconduct/)

**Grievance Procedure**

All students desiring to appeal matters relating to their graduate education should request a copy of Grievance Procedures for Graduate Students at Oregon State University (https://gradschool.oregonstate.edu/progress/grievance-procedures/) from the Graduate School. Graduate assistants whose terms and conditions of employment are prescribed by the collective bargaining agreement between OSU and the Coalition of Graduate Employees, American Federation of Teachers Local 6069, should also refer to that document.

**Policies Governing Graduate Certificate Programs**

**General Requirements**

The Graduate Certificate Program at Oregon State University is a structured progression of graduate-level courses that constitute a coherent body of study with a defined focus within a single discipline or a logical combination of disciplines. It is designed for a student who has completed a baccalaureate degree and is in pursuit of advanced-level learning. Graduate certificates reflect the educational mission of the university. Students desiring a graduate certificate must be admitted to the university as a credential-seeking graduate student, but are not required to be on track for a specific degree. There is no formal committee requirement for graduate certificates. Certificate students are subject to all general policies governing the courses for the master’s degree, unless specified within the Graduate Catalog.

**Graduate Certificate Study Program**

The graduate certificate curriculum consists of a minimum of 18 graduate credits, and may include a final project, portfolio, or report for integration of the sequence of course materials. All graduate student programs of study submitted to the Graduate School must consist of, at a minimum, 50 percent graduate stand-alone credits. The remaining
credits may be the 500 component of 400/500 slash courses. No final examination is required.

**Time Limits**

Courses completed no more than seven years prior to the graduate certificate award may be used to satisfy certificate requirements. Students enrolled in certificates without concurrent enrollment in a graduate degree program are not subject to the continuous enrollment policy during the time allowed for certificate completion.

**Financial Aid Eligibility**

Students enrolled in only graduate certificate programs may qualify for federal loan and work-study financial aid. Students must complete the federal FAFSA form to begin the financial aid application process.

**Policies Governing Master's Degree Programs**

**General Requirements**

All master's degree programs require a minimum of 45 graduate credits including thesis (6 to 12 credits), research-in-lieu-of-thesis (3 to 6 credits), or an integrative capstone experience (3 to 6 credits). Exceptions to this capstone requirement are specified under the degree descriptions that follow these universal master's degree requirements. Effective fall 2005, all graduate student programs of study submitted to the Graduate School must consist of, at a minimum, 50 percent graduate stand-alone courses. The remaining credits may be the 500 component of 400/500 slash courses. General regulations for all master's programs are cited here, with certain exceptions provided for master's degrees in the professional areas listed on the following pages.

All master's students must:

1. Conduct research, produce some other form of creative work, or participate in an integrative capstone experience; and
2. Demonstrate mastery of subject material; and
3. Be able to conduct scholarly or professional activities in an ethical manner

The assessment of these outcomes and the specification of learning objectives related to these outcomes are to be carried out at the program level.

**Residence Requirements**

The residence requirement for the master's degree is 30 graduate Oregon State University credits after admission as a degree-seeking graduate student. These 30 graduate credits must appear on the master's degree program. (This does not include graduate credits taken as an undergraduate, post-baccalaureate or graduate nondegree-seeking student, nor transfer courses.)

**Language Requirements**

For the master of arts degree, the student must show foreign language proficiency (including American Sign Language) equivalent to that attained at the end of a second-year university course in that language with a grade of 'C' (2.00) or better. English is not considered a foreign language for purposes of this requirement. There is no language requirement for the Master of Arts in Interdisciplinary Studies degree. For other master's degrees, there is no foreign language requirement unless a language is required in the individual student's program. A student must be enrolled to complete their foreign language requirement before they take the final oral examination for the degree.

**Graduate Program of Study**

A regular master's degree student must complete a program of study in consultation with an advisor/advisory committee before completing 18 graduate credits. This includes credits earned as a post-baccalaureate, graduate nondegree-seeking student, or graduate student.

Students who wish to transfer credit must submit a Transfer Credit Request form (https://gradschool.oregonstate.edu/forms/) before the end of their first year of study.

The final program of study must be submitted to the Graduate School at least 15 weeks prior to the date of the student's final examination.

Effective fall 2005, all graduate student programs of study submitted to the Graduate School must consist of, at a minimum, 50 percent graduate stand-alone courses. The remaining credits may be the 500 component of 400/500 slash courses.

If a minor is declared, approximately two-thirds of the work (30 graduate credits) should be listed in the major field and one-third (a minimum of 15 graduate credits) in the minor field. In such cases, the student's advisory committee must include a member from the minor department.

The program is developed under the guidance of the major professor, and minor professor when a minor is included, and signed by those professors and the chair of the academic unit before filing in the Graduate School. Each candidate's program should include substantial work with at least three faculty members offering graduate instruction. Changes in the program may be made by submitting a Petition for Change in Program form (https://gradschool.oregonstate.edu/forms/).

**Time Limit**

All work toward a master's degree, including transferred credits, course work, thesis (if required), and all examinations, must be completed within seven years. Time in which the student is on a leave of absence is included in the seven year limit.

**Thesis**

When scheduling their final oral examinations, thesis option master's students are required to submit the pretext pages of their thesis to the Graduate School at least two weeks prior to the final oral examination. Pretext pages include the abstract, copyright, title page, approval page, acknowledgment page, contribution of authors, table of contents, list of figures, tables, appendices, dedication (optional), and preface (optional). It is expected that students will distribute examination copies to all their committee members, including the Graduate Council representative, sufficiently early to permit thorough review of the thesis prior to the student's final oral examination.

Within six weeks after the final oral examination or before the first day of the following term, whichever comes first, students must upload one PDF copy of the thesis, without signatures, electronically to ScholarsArchive and submit the signed ETD submission approval form with a copy of the title page to the Graduate School. If final submission requirements are completed after the initial six-week period, the student may be subject to re-examination. Please refer to the Graduate School's thesis guide (https://gradschool.oregonstate.edu/progress/thesis-guide/) for complete details.
Signatures on the ETD submission approval form can be electronic, signed, scanned and emailed or faxed. The thesis will not be accepted for graduate requirements until it has received approval by the graduate dean, which the thesis editor will obtain.


The results from studies conducted using human subjects without obtaining Institutional Review Board approval shall not be used to satisfy master's thesis or doctoral dissertation requirements. For more information, please send an email to irb@oregonstate.edu or visit the IRB website. (https://research.oregonstate.edu/irb/)

The credit allowed for the thesis, including research and preparation of the manuscript, varies from 6 to 12 credits. In certain departments and programs, the M.S. or M.A. thesis is optional, to be determined in each case by the department/school/program and the major professor. See departmental descriptions.

**Final Examination**

Successful completion of a final oral examination is required for all master's degrees with the exception of the following graduate programs:

- EdM students who complete the nonthesis option must take a final written examination.
- MBA students submit capstone projects that are assessed at the curricular core and graduate option levels, in addition to being assessed upon their fulfillment of graduate learning outcomes.
- MCoun students admitted to the degree program prior to June 2017 must successfully pass a written project portfolio that demonstrates mastery of the MCoun learning outcomes.
- MCoun students admitted to the program beginning June 2017 must successfully pass a nationally administered exam determined by program faculty.
- MEng students in most majors may complete degree requirements by successfully completing a portfolio course and earning a passing grade on a portfolio in lieu of a final oral examination.
- MPH students must complete final assessments or oral examinations based upon the academic option in which they are enrolled.

Some departments also require the student to pass a written exam prior to the oral exam.

The final oral examination for master's candidates may, at the discretion of the graduate program, consist of a public thesis defense followed by a closed session of the examining committee with the candidate. Under normal circumstances, the final oral examination should be scheduled for two hours.

For master's candidates whose programs require a thesis, not more than half of the examination period should be devoted to the presentation and defense of the thesis; the remaining time can be spent on questions relating to the student's knowledge of the major field, and minor field if a minor is included in the program of study. Graduate faculty serving on thesis-oriented master's degree programs may contribute to the direction of the student's thesis, will assess the student's thesis and his or her defense of it in the final oral examination, will vote to pass or fail the student, and may sign the thesis when it is in acceptable final form. The examining committee consists of at least four members of the graduate faculty—two in the major field, one in the minor field if a minor is included, and a Graduate Council representative. When a minor is not included, the fourth member may be from the graduate faculty at large. All members of the student's graduate committee must approve the scheduling of the final examination.

Students writing a thesis must have a Graduate Council representative on their committee. It is the student's responsibility to obtain his or her own Graduate Council representative from a list provided by the Graduate School. This must be done prior to scheduling the final exam.

When no thesis is involved, not more than half of the examination period should be devoted to the presentation of the research project; the remaining time can be spent on questions relating to the student's knowledge of the major field, and minor field if one is included in the program. For nonthesis master's degree programs, the major professor is responsible for directing and assigning a final grade for the research or culminating project. Other members of the nonthesis committee will assess the student's defense of the project in the final oral examination, as well as the student's knowledge of his or her field, and vote to pass or fail the student. No more than two re-examinations are permitted by the Graduate School, although academic units may permit fewer re-examinations. The examining committee consists of three members of the graduate faculty—two in the major field and one in the minor field if a minor is included. When a minor is not included, the third member may be from the graduate faculty at large.

**Policies Governing Doctoral Degree Programs**

**General Requirements**

The doctor of philosophy degree is granted primarily for creative attainments. There is no rigid credit requirement; however, the equivalent of at least three years of full-time graduate work beyond the bachelor's degree (at least 108 graduate credits) is required. Effective fall 2005, all graduate student programs of study submitted to the Graduate School must consist of, at a minimum, 50 percent graduate stand-alone courses. The remaining credits may be the 500 component of 400/500 slash courses.

After admission into the doctoral program, a minimum of one full-time academic year (at least 36 graduate credits) should be devoted to the preparation of the thesis. A minimum of 27 regular non-blanket credits must be included on a doctoral program.

By completing the requirements necessary for the PhD, students shall: (a) produce and defend an original significant contribution to knowledge; (b) demonstrate mastery of subject material; and (c) be able to conduct scholarly activities in an ethical manner. Additional program specific learning outcomes, the assessment of all outcomes and the specification of learning objectives related to these outcomes are to be carried out at the program level.

**Graduate Program of Study**

The student's doctoral program of study is formulated and approved subject to departmental policies at a formal meeting of his or her doctoral committee. The committee is comprised of a minimum of five members of the graduate faculty, including two from the major department and a representative of the Graduate Council. If a minor is declared, it must consist of at least 18 credits (15 credits for an integrated minor) and the committee must include a member from the minor department. All committee members must be on the graduate faculty with appropriate authorization to serve on the student's committee.
Doctoral students must complete the program of study in consultation with their advisory committee. This signed plan must be submitted to the Graduate School by the end of the fifth term of study.

The student must be registered for a minimum of 3 credits for the term in which the program meeting is held. When the program is approved by the doctoral committee, the departmental chair, and the dean of the Graduate School, it becomes the obligation of the student to complete the requirements as formulated. Changes in the program may be made by submitting a Petition for Change of Program form (https://gradschool.oregonstate.edu/forms/) available in the Graduate School.

Selected 700-level courses that have been deemed equivalent to graduate-level learning may be used on doctoral programs of study upon approval of the student’s graduate committee.

No more than 15 credits of blanket-numbered courses, other than thesis, may be included in the minimum 108-credit program.

Students who wish to transfer credit must submit a Transfer Credit Request form (https://gradschool.oregonstate.edu/forms/) before the end of their first year of study.

Time Limit
Effective beginning with students matriculating fall term 2016, all work toward a doctoral degree, including course work, thesis (if required), and all examinations, must be completed within nine years of the indicated start term on the Departmental Action Form. Extensions of this time limit may be requested by submitting a petition to the Graduate School.

Residence
For the doctoral degree, the residence requirement consists of two parts:

1. a minimum of 36 graduate Oregon State University credits must be completed; and
2. the student must spend at least three terms of full-time graduate academic work (at least 9 credits per term) on campus or at an off-campus site approved by the Graduate School. The latter requirement of three terms of full-time enrollment does not have to take place in consecutive terms.

Adequate fulfillment of the residence requirement shall be determined by the Graduate School.

Language Requirements
The foreign language requirement is determined by the student’s doctoral committee, subject to the same approval required for the graduate study program, and is so designated in the official doctoral program. Foreign language requirements must be completed before the oral preliminary examination.

Preliminary Examinations
The student working toward a doctoral degree must pass a comprehensive preliminary examination. The purpose of this exam is to determine the student’s understanding of his or her major and minor fields and also to assess the student’s capability for research. Students must enroll for a minimum of 3 credits during terms in which they undertake departmental written or oral preliminary examinations.

Written Comprehensive Examination
Most programs require a written comprehensive examination to be taken before the oral preliminary examination. If a written examination is required, it must be completed prior to the oral preliminary examination.

The content, length, timing, passing standard, and repeatability of this examination are at the discretion of the major department. The general rules and structure of this examination, however, must be provided in writing to all candidates for this examination and a current copy of these guidelines must be on file with the Graduate School. Copies of the written examination (questions and student’s answers) must be available to all members of the student’s doctoral committee at least one week prior to the oral preliminary examination.

Oral Preliminary Examination
The oral preliminary examination is taken near the completion of the student’s course work. The oral examination is conducted by the student’s doctoral committee, and should cover the student’s knowledge in his or her major and minor subjects. The exam may cover the student’s proposed research topic, although no more than one-half the time should be devoted to specific aspects of the proposal. The examination should be scheduled for at least two hours, and the exam date must be scheduled in the Graduate School at least two weeks in advance. If more than one negative vote is recorded by the examining committee, the candidate will have failed the oral examination. No more than two re-examinations are permitted by the Graduate School, although academic units may allow fewer re-examinations.

At least one complete academic term must elapse between the time of the preliminary oral examination and the final oral examination. If more than five years elapse between these two examinations, the candidate will be required to take another preliminary oral examination.

Thesis
Each candidate for the PhD degree must submit a thesis embodying the results of research and giving evidence of originality and ability in independent investigation. The thesis must be a real contribution to knowledge, based on the candidate’s own investigation. It must show a mastery of the literature of the subject and be written in creditable literary form. The preparation of an acceptable thesis will require at least one full-time academic year. The booklet, Thesis Guide: Preparing a Thesis or Dissertation at OSU, is available electronically on the Web at https://gradschool.oregonstate.edu/progress/thesis-guide (https://gradschool.oregonstate.edu/progress/thesis-guide/).

The results from studies conducted using human subjects without obtaining Institutional Review Board approval shall not be used to satisfy master’s thesis or doctoral dissertation requirements. For more information, please send an email to irb@oregonstate.edu or visit the IRB website. (https://research.oregonstate.edu/irb/)

A formal thesis proposal meeting is recommended but not required by the Graduate School; however, it is required for some majors. This meeting should be held with the student’s doctoral committee prior to the start of any substantial doctoral thesis research.

When scheduling their final oral examinations, doctoral students are required to submit the pretext pages of their dissertations to the Graduate School at least two weeks prior to the final oral examination. Pretext pages include the abstract, copyright (optional), title page, approval page, acknowledgment page, contribution of authors, table of contents, list of figures, tables, appendices, dedication (optional), and preface (optional). It is expected that students will distribute examination copies of their thesis to all committee members, including the Graduate Council representative, sufficiently early to permit thorough review of the thesis prior to the student’s final oral examination.
Within six weeks after the final oral examination or before the first day of the following term, whichever comes first, upload one PDF copy of your thesis, without signatures, electronically to ScholarsArchive and submit the signed ETD submission approval form with a copy of the title page to the Graduate School. If final submission requirements are after the initial six-week period, the student may be subject to re-examination. Please refer to the Graduate School’s thesis guide (https://gradschool.oregonstate.edu/progress/thesis-guide/) for complete details.

Signatures on the ETD submission approval form can be electronic, signed, scanned and emailed or faxed. The thesis will not be accepted for graduate requirements until it has received approval by the graduate dean, which the thesis editor will obtain.

Final Examination

After completion of or while concurrently registered for all work required by the program, the student must pass a final doctoral examination that may be written in part but must include an oral examination. The final oral examination must be scheduled in the Graduate School office at least two weeks prior to the date of the examination. All incomplete course work appearing on the program of study must be completed prior to scheduling the final oral examination.

The final oral examination consists of a public thesis defense followed by a closed session of the examining committee with the candidate. Under normal circumstances, the final oral examination should be scheduled for two hours.

All members of the student’s graduate committee must approve the scheduling of the final examination.

It is expected that the thesis defense portion of the final oral exam be open to all interested persons and should be limited to one hour. After the open portion of the exam, the examining committee should exclude all other persons and continue with the examination of the candidate's knowledge of his or her field and the evaluation of the candidate's performance.

If the department favors a more elaborate presentation, it should be scheduled as a separate seminar. In any case, the time involved for the open presentation may not impinge upon time required for the examining committee to conduct appropriate, iterative oral inquiry with the candidate, to evaluate the candidate's performance, and to deliberate fully within the time constraints of the scheduled oral examination.

The examining committee consists of the student's doctoral committee and any additional members, including professors from other institutions, whom the major department may recommend. In the oral examination, the candidate is expected to defend the thesis and show a satisfactory knowledge of his or her field. If more than one negative vote is recorded by the examining committee, the candidate will have failed the examination. No more than two re-examinations are permitted by the Graduate School, although academic units may permit fewer re-examinations.

The final oral examination must be taken within five years after the oral preliminary examination. If more than five years elapse, the candidate will be required to take another oral preliminary examination.

Doctor of Education Requirements

The EdD program is intended for the educational professional whose career path is that of educational or teaching specialist, administrator, or other practitioner in the public schools, postsecondary institutions of higher education, or in business and industry. Its focus is on the application of knowledge to learning and teaching environments in public and private settings. The EdD program is designed to prepare educational leaders in community college education, middle-level education, or related educational settings.

Learn more about the admission requirements of the EdD from the College of Education’s website. (https://education.oregonstate.edu/ahe/)

In general, the following requirements are in effect for the EdD:

1. A minimum of 108 credits beyond the baccalaureate degree.
2. Effective fall 2005, all graduate student programs of study submitted to the Graduate School must consist of, at a minimum, 50 percent graduate stand-alone courses. The remaining credits may be the 500 component of 400/500 slash courses.
3. Completion of the same residence requirements as listed for the PhD degree.
4. A dissertation of no less than 24 credits.
5. A mentored internship in an appropriate work setting for a minimum of 12 credits.
6. A minimum of 48 graduate credits in an area of specialty in education.
7. Completion of 24 credits of core seminars.
8. Completion of the core courses in research.

Procedures and requirements for preliminary and final examinations and thesis are the same as those for the doctor of philosophy degree.

Leadership

The Graduate School oversees admission standards, and degree requirements; enforces current regulations; recommends changes in graduate policy to the Graduate Council; acts on petitions to deviate from existing regulations; and is responsible for the efficient and effective operation of the Graduate School.

Philip Mote, Vice Provost and Dean, 541-737-1458
Steph Bernell, Associate Dean, 541-737-9162
Yanyun Zhao, Associate Dean and Director of the Office of Postdoctoral Programs, 541-737-0556
Rosemary Garagnani, Assistant Dean for Enrollment Management and Student Services, 541-737-1465
Jessica Beck, Assistant Dean of Graduate Student Development, 541-737-8576
Nick Fleury, Director of Financial Support
Kim LeMay, Executive Assistant to the Dean, 541-737-1456
Maureen Childers, Assistant to the Associate Deans and Assistant to the Office of Postdoc Programs, 541-737-2033

Find a list of all Graduate School staff on our website. (https://gradschool.oregonstate.edu/staff/)

Mission

In partnership with the graduate faculty, the Graduate School plays a leadership and advocacy role to ensure that Oregon State attracts the best graduate students and delivers a compelling and high-quality graduate experience that prepares students to create new ideas and knowledge, to educate others, to make positive impacts on society, and to lead innovation.
Graduate Council

The Graduate Council guides the development and revision of policies, procedures and requirements related to graduate education, within the general authority granted by the State Board of Higher Education. The council establishes admission standards, basic degree requirements, and general policies; approves all graduate faculty members, new programs, and courses; and periodically reviews all existing graduate programs. Graduate Council members are appointed by the Executive Committee of the Faculty Senate, with each academic college having one representative. Major actions of the Graduate Council are referred to the Faculty Senate for review and approval.

Find current and past Graduate Council membership and information. (http://senate.oregonstate.edu/graduate-council/)

Graduate Faculty

Graduate faculty members are chosen from the university faculty based on their academic training, experience, demonstrated potential for scholarship, and evidence of their ability and competency to direct and supervise graduate students in the pursuit of advanced knowledge.

Each graduate faculty member is authorized to perform specific activities within a particular graduate program. The head and academic dean of each unit are responsible for nominating faculty members for these activities, subject to review and approval by the Graduate Council.

Academic Units

An academic unit is the administrative unit responsible for directing and managing a graduate major or minor field of study. An academic unit may be an academic program, department, school, or college, or composite of these. The chief administrative officer of the academic unit is responsible for managing the graduate programs in that unit and is responsible to the dean of the Graduate School for all graduate work performed by the unit.

Academic units have a major role in the success of graduate education. Within the general rules of the Graduate School, the academic units establish and teach courses, maintain a graduate faculty to teach and supervise research, establish their own admission standards and specific graduate certificate and degree requirements, make graduate student appointments, and provide advice and supervision for their graduate students.

Address

Heckart Lodge
2900 SW Jefferson Way
Oregon State University
Corvallis, OR 97331-2121
Phone: 541-737-4881
Fax: 541-737-3313
Website: https://gradschool.oregonstate.edu

Graduate tuition and fees

The official Graduate Tuition and Fee Schedule can be found on the OSU Business Affairs website. (http://fa.oregonstate.edu/business-affairs/tuition-and-fee-information/) Tuition and fees for the next year are usually finalized during the month of July prior to the academic year start.

Residency

For questions about what qualifies for Oregon residency status, please visit the Office of Admissions’ residency website. (http://admissions.oregonstate.edu/residency/)

Graduate fellowships and scholarships

A number of Oregon State University fellowships and scholarships are available to students for graduate study in various graduate programs at Oregon State. For a listing of many of these fellowships and scholarships, visit Scholar Dollars. (https://scholarships.oregonstate.edu/scholardollars/)

For more information about scholarships and fellowships in the database above, including application instructions, as well as additional opportunities, contact the individual program of interest.

Additionally, the Graduate School offers a number of fellowship and scholarship opportunities, many of which require nomination by the student’s academic unit. For information about these opportunities or general information about graduate student funding, please visit the Financing Your Education section (https://gradschool.oregonstate.edu/finance/) of our website.

Graduate student assistantships and hourly employment

Each year, Oregon State receives grants from federal and state agencies, public and private foundations, and business and industry to support institutional and individual projects. Funding is awarded to various units in academic colleges and to other research organizations on campus, including experiment stations, centers and institutes. Many of these grants include financial support for graduate students. Interested students should direct inquiries and applications to the unit concerned.

Graduate students may be employed as graduate teaching or graduate research assistants by units on campus. In addition to monthly stipends, graduate assistants appointed at .30 FTE or above are eligible for a tuition and fee subsidy plus health insurance. (https://studenthealth.oregonstate.edu/insurance/) Graduate assistants are represented by the Coalition of Graduate Employees (CGE) and covered by the Collective Bargaining Agreement. (https://hr.oregonstate.edu/employees/administrators-supervisors/graduate-employee-cge-contract-resources/)

In addition to graduate assistantships, graduate students may be hired for hourly student positions on campus. These appointments are not eligible for a tuition or fee subsidy.

The maximum combined appointment FTE for all jobs on campus is .49 FTE.

For more information on student employment, contact the academic unit of interest or the Office of Human Resources. (https://hr.oregonstate.edu)

Financial aid

The Office of Financial Aid administers federal financial aid programs to assist graduate students with meeting the cost of higher education. To determine eligibility for specific federal aid programs at Oregon State, graduate students are required to complete the Free Application for Federal Student Aid (FAFSA) each year. Graduate students must be degree-seeking or in an approved certificate program and enrolled at least half-time (5 credits) to qualify for financial aid. Graduate students are
not eligible for federal Title IV grants or subsidized loans. Students in graduate certificate programs are only eligible for aid for courses required for their certificate program.

For additional information about Financial Aid for graduate students, visit the Office of Financial Aid website (https://financialaid.oregonstate.edu/financial-aid/), download the PDF (https://financialaid.oregonstate.edu/sites/financialaid.oregonstate.edu/files/grad_students_.pdf) or find contact information (https://financialaid.oregonstate.edu/contact-us/).

List of graduate programs (http://catalog.oregonstate.edu/programs/#filter-filter_40)

Master of Arts in Interdisciplinary Studies
The Master of Arts in Interdisciplinary Studies (MAIS) degree is granted for attainment of broad, advanced knowledge and achievement integrated from three fields of study. Most graduate majors or minors may serve as a field for this degree. The current list of approved majors is on the Graduate School website (http://gradschool.oregonstate.edu/programs/). Two of the three fields may be from one department if the areas of concentration within these two fields are different. A minimum of 9 credits in each of the three fields of study is required. The degree requires a minimum of 49 credits, including 4 credits of course work on interdisciplinary research methods.

No more than 21 credits (excluding thesis or research paper credit) may be taken in any field unless the total program exceeds 49 credits. There is no foreign language requirement. No more than 3 credits of blanket-numbered courses in each field of study may be used in the program; thesis credits (Option A) or research paper credits (Option B) are exempt from this limitation. The student’s committee consists of four members of the graduate faculty—one from each of the three fields—and a Graduate Council representative. A formal program meeting must be held prior to the completion of 18 graduate credits. A final oral examination is required.

Two options under the program:

Option A: Thesis option. The thesis must coordinate work in the three fields. The requirement is 6 to 9 credits of Thesis 503. The thesis advisor must be a member of the graduate faculty authorized to direct theses.

Option B: Research paper option. The research paper must integrate work from at least two of the three fields. The requirement is 4 to 7 credits, registered as Research 501, Reading and Conference 505, or Projects 506.

Master of Arts in Teaching (MAT)
The Master of Arts in Teaching is an intensive professional degree program intended to prepare teachers for careers in public school education. Students who successfully complete the MAT can be recommended for the Oregon basic teaching license upon the positive evaluations of the university and public school supervisors.

The professional program in teacher education is full-time and one calendar year in length. Students will enroll with their subject area cohort group and complete the program in one year. Teacher licensure is offered in the following areas:

- Advanced Mathematics Education
- Agricultural Education
- Biology Education
- Chemistry Education
- Elementary Education
- Family and Consumer Sciences Education
- Integrated Science Education
- Language Arts Education (English) — Cascades Campus only
- Music Education
- Physics Education
- Spanish Education

The professional teacher education program begins with a 15-credit professional education core that is foundational to and a prerequisite for the 48-credit Master of Arts in Teaching degree. The 48-credit MAT includes a professional education concentration (3 credits), professional course work in the teaching specialty (18 to 21 credits), a public school professional internship (15 to 18 credits), and a minimum of 9 graduate credits in the subject matter specialization (mathematics, physics, literature, etc.). Because the professional teacher education program is a two-part program, including the professional core and the MAT, future students may plan their programs as either five-year (with a nine-month MAT) or as fifth year programs (with 12 months of graduate study including both the professional core and the MAT).

The MAT degree requires successful completion of a final oral examination.

Master of Athletic Training
The Master of Athletic Training (MATRN) degree program consists of a combination of didactic, laboratory and clinical education experiences, from which students in athletic training attain the entry-level educational competencies stipulated by the national accrediting agency for the athletic training profession, the Commission on the Accreditation of Athletic Training Education (CAATE). Graduates are expected to take and pass the certification examination offered by the Board of Certification and embark on careers as Certified Athletic Trainers.

Master of Business Administration
The MBA program represents a broad, yet responsive general management education with an entrepreneurial focus that crosses the functional disciplines of business. Its advanced management emphasis and entrepreneurial focus creates practical value-added content for all students, both business and nonbusiness undergraduates, enabling them to solve complex business problems and successfully compete in the business marketplace.

The MBA program is concentrated in length—three academic terms for full-time students with a BA/BS in business or who have completed the foundation courses. Full-time students with no previous business or business-related course work can complete the program in as few as six terms. The MBA degree requires no thesis. MBA students submit capstone projects that are assessed at the curricular core and graduate option levels, in addition to being assessed upon their fulfillment of graduate learning outcomes.

Master of Accountancy
The Master of Accountancy is a one-year master’s program for students with an undergraduate degree in accounting. It allows accounting students to receive an undergraduate degree and a master’s degree during their five years of university study required to become a CPA. As an integrated program, the MAC is designed to allow students the opportunity to plan early enough in their accounting education program to enable them to receive both an undergraduate degree and a graduate
degree. The MAC is also designed to accommodate postbaccalaureate students wishing to prepare for accounting careers.

Master of Counseling (MCoun)

Students admitted to the MCoun degree program prior to June 2017 must successfully pass a written project portfolio that demonstrates mastery of the MCoun learning outcomes. Students will specifically address graduate learning outcomes (G.L.O.’s) by describing how they have and/or how they would utilize research/evidence-based counseling practice in their clinical work. Students will be required to describe an ethical dilemma they have faced in their clinical practice to date and include an ethical decision model when describing their ethical decision-making processes. The written project portfolio will assess the 8 CACREP areas, in which the MCoun learning outcome objectives are based. A student shall receive a Pass when the grading committee unanimously grades the portfolio as a Pass.

Students admitted to the MCoun degree program beginning June 2017 must successfully pass a nationally administered exam determined by program faculty. The written exam will evaluate all three graduate learning outcomes (G.L.O.’s). Successful completion of the national exam will evidence the candidate’s mastery of MCoun subject material covered in the program and assess the candidate’s ability to apply research and ethical proficiencies on the exam. The exam will assess the 8 CACREP areas, in which the MCoun learning outcome objectives are based.

The minimum passing score for the national exam is defined as one standard deviation below the national mean at the time of administration. Candidates who do not pass the national exam are allowed to take re-examination, but not before the end of the term in which the exam was administered. No more than two re-exams are permitted.

Please contact the College of Education for additional information regarding additional MCoun examination requirements, graduate learning outcomes, and the CACREP national examination.

Master of Education

The Master of Education (EdM) is a professional degree requiring a minimum of 45 credits in graduate courses (including a maximum of blanket-numbered courses); additional credits may be required in some areas of concentration. A minimum of 9 additional credits in graduate courses is required for the masters degree in College Student Services Administration (CSSA).

The EdM degree requires successful completion of a final written examination.

A candidate for the EdM degree qualifies for the degree under one of these options:

1. The student submits a thesis that meets all standards for a masters thesis on some applied or professional aspect of education. For the thesis the student receives 6 credits. They must complete a major of 24 credits (which may include the 6 thesis credits) and 21 elective credits determined under the direction of an advisor.
2. For adult education, the student completes 30 credits in the major and at least 15 credits in the minor. The minor may be completed either inside education or from approved minors outside education and serves students focusing on training and development and developmental education.
3. The student completes 45 credits with 24 credits in specific courses for the major. No minor is identified. The remaining 21 credits are elective under the direction of an advisor. No thesis or field studies are required. This option is designed primarily for in-service teachers working on standard licensure.
4. The student majors in College Student Services Administration and completes at least 39 credits in the major and 15 credits in a minor for a minimum of 54 credits.

Master of Engineering

The Master of Engineering (MEng) degree is designed to provide students the opportunity to pursue advanced-level study in a field of engineering. The degree is concerned with application of specialized, graduate-level engineering and managerial knowledge to specific engineering disciplines. The degree is a course work-only degree, with the option of substituting research or internship credits for a few courses. No thesis or project is required.

The MEng program requires a minimum of 45 credits. The examining committee consists of a minimum of three members of the graduate faculty in the engineering specialization. A final oral examination is required.

Master of Fine Arts

The Master of Fine Arts is an appropriate terminal degree for those who wish to teach in creative, performing, and studio arts in higher education. The MFA in Creative Writing is a program that helps students define and advance their literary ambitions and develop their skills as artists and teachers. Students will be introduced to three broad areas of knowledge within the field of creative writing that they need in order to become successful writers, editors, or teachers. These areas involve writing, reading, and marketing skills within contemporary literary fiction, poetry, and nonfiction. The degree requires a minimum of 60 credits comprised of 24 credits in creative writing workshops, 24 credits in literature and/or composition and rhetoric and one course emphasizing literary roots, and 12 credits in thesis and/or writing and conference. All MFA candidates are required to complete a thesis, which is to be a sustained piece of imaginative writing of literary merit. A final oral examination is required.

Master of Forestry

The professional Master of Forestry degree is intended for potential administrators and potential professional forestry and natural resource specialists in public and private organizations where persons of broad ability are demanded and a broad technical education is needed. A thesis is not required, but a technical report on an approved topic, correlated with courses in the major field, must be submitted. A final oral examination is required.

Master of Health Physics

The Master of Health Physics degree is designed to be a professional, advanced graduate degree that emphasizes fundamental learning and professional development for those wishing the master’s credential, but not requiring a research focus for their planned profession. The degree directs students toward professional licensing as a certified health physicist in the field of radiation protection. The program will consist of a minimum of 45 graduate credits, with 30 graduate credits in the major, and 15 elective graduate credits. A final oral examination is required.

Master of Medical Physics

The Master of Medical Physics (MMP) degree prepares the graduate for a professional career in applied medical physics, focused on practical hands-on experience. The MMP program is designed as a clinical specialization for individuals with an undergraduate degree in science or engineering, offering areas of concentration in therapeutic radiologic
Master of Natural Resources
The Master of Natural Resources (MNR) degree is designed to engage university scientists and world-wide natural resource professionals in a process that integrates diverse perspectives to address natural resource challenges at the state, regional, national, and international levels. The program is intended for individuals with at least two years of experience in natural resource disciplines who seek an advanced degree in natural resource management. The MNR curriculum, consisting of 45 credits, is organized into three sections: core (18 credits), area of emphasis (18 credits), and capstone project (9 credits). It is taught as a distance, online curriculum, although it may be possible for some students to work toward the MNR degree while in residence at Oregon State University. The MNR degree is offered as a non-thesis option only. A final oral examination is required.

Master of Public Health
The Master of Public Health (MPH) degree program combines broad training in public health with specific training in one of the specialty options.

The MPH program is designed for persons who already have a bachelor's degree and who wish to obtain further formal education in the field of public health. Persons with experience in the health field or who have training in a specialized area of health may increase their knowledge regarding population-based health to prepare them for expanded administrative and service careers. Persons who do not have prior experience in health fields may prepare themselves for a broad variety of careers depending upon their choice of specialty option.

The Master of Public Health degree is offered by Oregon State University with graduate options in biostatistics; environmental and occupational health; epidemiology; global health; health management and policy; health promotion and health behavior; physical activity; and public health practice.

The MPH program consists of 12 core credits, plus additional units of required and elective courses, and an internship. Programs are approximately 60 credits in length. All students will be required to take a final oral examination or alternative summative assessment as determined by their specific option.

Master of Public Policy
The Master of Public Policy is a professional degree intended to prepare students for careers in the public, nonprofit, and international sectors and offer training for in-service students desiring professional growth and advancement. The degree is designed to be a generalist program, with an emphasis on analytic skills and policy knowledge. The degree requires a minimum of 62 graduate credits, 44 of which are in the required core. The core curriculum provides an important foundation in statistics, research methods, computer applications, public policy analysis, public administration and ethics, and economics. The remaining 18 credits support the student’s preferred area of concentration, consisting of environmental policy, international policy, rural policy, science policy, or social policy. Students with little work experience in public service, the nonprofit sector, or the international context will be required to engage in a supervised internship that will allow them to work closely with experienced mentors who will help them integrate theory with practice and introduce them to a professional network. Students with relevant work experience will substitute course work for internship credits. A final oral examination is required.

Professional Science Master's Degree (PSM)
The Professional Science Master’s (PSM) allows students to pursue advanced training in science while simultaneously developing workplace skills highly valued by employers. PSM programs consist of two years of academic training in an emerging or interdisciplinary area in science, along with a professional component that includes internships and ‘cross-training’ in workplace skills, such as business, communications, and regulatory affairs. All have been developed in concert with employers and are designed to dovetail into present and future professional career opportunities.

The Professional Science Master’s Degree (PSM) is offered with two graduate majors:
1. Environmental Sciences
2. Fisheries and Wildlife Administration

For further information on Environmental Sciences, email: carolyn.fonyo@oregonstate.edu
For further information on Fisheries and Wildlife, email: fw.gradadvising@oregonstate.edu

Graduate Education

GRAD 420. GRADUATE SCHOOL PREPARATION. (1 Credit) Applying for graduate or professional school can be a daunting task. How and where to apply, how to choose an advisor, what to look for in a school, and how to obtain funding are hurdles to overcome during the application process. Supplemental materials will be provided as part of the course materials.
Equivalent to: IST 420

GRAD 430. INTRODUCTION TO SCIENTIFIC DIVING. (4 Credits) Incorporates academic, confined water and open water training to prepare the student to manage the task loading associated with performing scientific tasks underwater. Introduces the diver to basic techniques and equipment used in underwater data collection. Qualifies the student for acceptance into the OSU Scientific Diving Program as a Scientific Diver-in-Training, at the discretion of the DSO and OSU Diving Control Board. Includes field trips.

GRAD 499. SPECIAL TOPICS. (4 Credits) Graduate school preparation.
Equivalent to: IST 499

GRAD 502. INDEPENDENT STUDY. (1-16 Credits) Lab/Field trip fee.
This course is repeatable for 16 credits.

GRAD 505. READING AND CONFERENCE. (1-16 Credits) Reading and discussions on special topics. Graded P/N. This course is repeatable for 16 credits.

GRAD 506. PROJECTS. (1-16 Credits) Graded P/N. This course is repeatable for 16 credits.
Grad 509. Practicum. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

Grad 511. Designing a Path for Success. (1 Credit)
Graduate student learners will be oriented onto paths that will help lead them toward degree completion and success. Students will receive foundational knowledge about graduate school requirements, effective mentor/mentee relationships, financing their education, research integrity and professional conduct, innovation and commercialization, and other soft skills essential for their progress through their graduate program.
Equivalent to: WGSS 511, WGSS 512, WGSS 513

Grad 512. Current Issues in Higher Education. (3 Credits)
Explores current, work-relevant issues in higher education nationally. Development of plan to stay current with important issues.

Grad 513. Professional Development in College and University Teaching. (1-3 Credits)
Self-directed learning experience, providing structure and context for professional development opportunities in teaching, such as workshops, seminars, webinars, symposia, and other relevant programming. Designed to encourage and reward continuing investment in the development of knowledge and skill sets as educators. Consists of participating in self-selected teaching-related programming (in-person or online), as well as reading, writing, and reflecting on your chosen experiences.
This course is repeatable for 3 credits.

Grad 520. Responsible Conduct of Research. (2 Credits)
Covers 10 topics in responsible conduct of research: ethical decision making; human subjects; animal welfare; data acquisition, sharing and ownership; research misconduct; conflicts of interest; authorship; peer review; mentor/trainee responsibilities; and collaborative science. Weekly writing assignments. Useful to all students who conduct scholarly activity. Provides transcript-visible training in research ethics relevant to the Graduate Learning Outcome established by Faculty Senate to be able to conduct scholarly and professional activities in an ethical manner.
Equivalent to: IST 520

Grad 521. Research Data Management. (2 Credits)
Careful examination of all aspects of research data management best practices. Designed to prepare students to exceed funder mandates for performance in data planning, documentation, preservation and sharing in an increasingly complex digital research environment. Open to students of all disciplines.

Grad 522. Preparing an IRB Submission. (1 Credit)
Workshop-style course resulting in applications that are ready for IRB review. Ethical issues in research will be discussed. Students will draft all submission materials outside of class and participate in the critique of each other's protocols and consent forms. IRB approval will not be granted as part of this class. Graded P/N.

Grad 530. Introduction to Scientific Diving. (4 Credits)
Incorporates academic, confined water and open water training to prepare the student to manage the task loading associated with performing scientific tasks underwater. Introduces the diver to basic techniques and equipment used in underwater data collection. Qualifies the student for acceptance into the OSU Scientific Diving Program as a Scientific Diver-in-Training, at the discretion of the DSO and OSU Diving Control Board. Includes field trips.

Grad 542. The Inclusive Classroom: Difference, Power and Discrimination. (3 Credits)
An examination of multidisciplinary scholarship on difference, power, and discrimination; critical pedagogies; and curriculum transformation. Discussions of theory and research are coupled with practical hands-on opportunities for students to develop and hone their teaching and course development skills. Crosslisted as Grad 542/WGSS 542.
Equivalent to: WGSS 542

Grad 550. Introduction to Online Course Development and Facilitation. (2 Credits)
Prepares students to develop and teach distance courses. Students explore practical aspects of course development and facilitation: a brief history of distance education and pedagogical theory; course design principles; engagement of adult learners; active learning; and investigation of how online instruction, in addition to offering flexibility and convenience, also offers distinct pedagogical benefits. Open to students in all disciplines.

Grad 560. Theories of Teaching and Learning in Higher Education. (3 Credits)
Examination and analysis of theories and research related to teaching and learning in higher education contexts with emphasis on theoretical applications for GTAs, instructors, and other who teach in the college and university classroom.

Grad 561. Course Design and Methods for College & University Teaching. (3 Credits)
Exploration of research and research-based practices related to teaching and learning in higher education contexts with emphasis on course design, facilitation, and other instructional techniques for GTAs, instructors, and others who teach in the college and university classroom.

Grad 570. Translating Research to Innovation. (2 Credits)
Lenses of the Market® Stage 1: Research2Innovation is a course that provides teams of STEM professionals (university students, post docs and faculty, National Lab scientists and engineers or corporate R&D scientists and engineers) with a rapid introduction to the vocabulary, skills, tools, and road map needed for scientists and engineers to engage in successfully translating their research into innovations. The course utilizes the student's own research as the basis for the study.

Grad 571. Translating Innovation to Market I. (4 Credits)
Uses the team's platform diagram from Grad 570 to perform a deeper analysis into a set of three market/application pairs. Teams will develop a Star Market analysis using a decision matrix consisting of a set of market-aligned questions and a rubric to determine the potential value for their innovation. This information is parametrized by a market hypothesis consisting of a value proposition and differentiators and a set of aligned value chains.
Prerequisites: Grad 570 with C or better

Grad 599. Special Topics. (1-16 Credits)
Equivalent to: IST 599
This course is repeatable for 99 credits.

Grad 605. Reading and Conference. (1-16 Credits)
Reading and discussions on special topics. Graded P/N.
This course is repeatable for 16 credits.

Grad 606. Projects. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.
Biological Data Sciences Graduate Minor

The graduate minor in Biological Data Sciences will familiarize MS and PhD graduate students in the life sciences with research concepts and methodologies in quantitative sciences, and those in the quantitative sciences with research concepts and methodologies in life sciences. The disciplinary learning goals of the minor are by nature foundational. Thus, for example, students with advanced expertise in life sciences would receive foundational training in computer science, statistics and/or mathematics. Students with advanced expertise in computer science would receive foundational training in life science, statistics and, if needed, mathematics. A capstone collaborative problem-solving course will be required by all students. Students may complete all the course work in a single year (encouraged), or may choose spread the courses out over several years. With approval by the director of the minor, students may receive credit for courses taken for their major.

The minor is open to both MS and PhD students.

Minor Code: 1375

PhD students must complete at least 18 credits for the minor and MS students must complete 15 credits.

Students must select courses from at least two disciplinary focal areas outside their undergraduate and graduate majors. For example a life sciences student might take courses in mathematics and computer science, while a statistics student might take courses in computer science and life sciences. In each focal area, PhD students must take at least 5 credits and MS students at least 3 credits. Some courses span more than one focal area; these courses may not be counted towards two focal areas simultaneously.

Some courses that are electives in an MS or PhD major may also be counted towards the BLDS minor. For example, a PhD student in Molecular and Cellular Biology (MCB) may select MCB 576 as an elective for their MCB requirements, and also as computer science credit for the BLDS minor.

Required by All Students:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 599</td>
<td>SPECIAL TOPICS (Collaborative Problem-Solving in Biological Data Science)</td>
<td>3</td>
</tr>
</tbody>
</table>

Students who do not complete an ethics and professionalism class as part of their PhD major must take MCB 557 or an equivalent course.

Students are recommended to choose their courses from the following lists, depending on their prior preparation as an undergraduate. Equivalent or more advanced courses may be substituted after consultation with the BLDS director. Some courses require prerequisites. Some courses span more than one focal area; such courses can be counted towards one or other of those focal areas, but not both.

Life Sciences Focal Area

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 585</td>
<td>APPLIED BIOINFORMATICS</td>
<td>3</td>
</tr>
<tr>
<td>BOT 599</td>
<td>SPECIAL TOPICS (Introduction to Genome Biology)</td>
<td>3</td>
</tr>
<tr>
<td>BOT 575/MCB 575</td>
<td>COMPARATIVE GENOMICS</td>
<td>4</td>
</tr>
<tr>
<td>IB 592</td>
<td>THEORETICAL ECOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>IB 594</td>
<td>COMMUNITY ECOLOGY</td>
<td>5</td>
</tr>
<tr>
<td>MB 668</td>
<td>MICROBIAL BIOINFORMATICS AND GENOME EVOLUTION</td>
<td>4</td>
</tr>
<tr>
<td>MTH 527</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 528</td>
<td>STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>VMB 631</td>
<td>MATHEMATICAL MODELING OF BIOLOGICAL SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>VMB 670</td>
<td>INTRODUCTION TO SYSTEMS BIOLOGY</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Hours: 34

1 Recommended prerequisites may be waived with instructor approval
2 No prerequisites

Mathematics Focal Area

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 527</td>
<td>INTRODUCTION TO MATHEMATICAL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MTH 528</td>
<td>STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 563</td>
<td>PROBABILITY I</td>
<td>1</td>
</tr>
<tr>
<td>ST 521</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTH 564</td>
<td>PROBABILITY II</td>
<td>1</td>
</tr>
<tr>
<td>ST 522</td>
<td>INTRODUCTION TO MATHEMATICAL STATISTICS</td>
<td>1</td>
</tr>
<tr>
<td>VMB 631</td>
<td>MATHEMATICAL MODELING OF BIOLOGICAL SYSTEMS</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 15-17

1 Recommended prerequisites may be waived with instructor approval
2 The following sequences qualify for Mathematics Focal Area credit: MTH 563–MTH 564, MTH 564–ST 521, ST 521–MTH 564, ST 521–ST 522 does not qualify. Only one pair of courses can be claimed for credit.
3 No prerequisites

Statistics Focal Area

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 524</td>
<td>INTRODUCTION TO BIOSTATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>H 566</td>
<td>DATA MINING IN PUBLIC HEALTH</td>
<td>3</td>
</tr>
<tr>
<td>H 580</td>
<td>LINEAR REGRESSION AND ANALYSIS OF TIME TO EVENT DATA</td>
<td>4</td>
</tr>
<tr>
<td>H 581</td>
<td>GENERALIZED LINEAR MODELS AND CATEGORICAL DATA ANALYSIS</td>
<td>4</td>
</tr>
</tbody>
</table>

1 Recommended prerequisites may be waived with instructor approval
2 No prerequisites
MCB 599 SPECIAL TOPICS (Data Programming in R I and II) 1 2

Select one of the following:

MTH 563 PROBABILITY II 2,3 3-4
ST 521 INTRODUCTION TO MATHEMATICAL STATISTICS 4

Select one of the following:

MTH 564 PROBABILITY II 2,3 3-12
ST 522 INTRODUCTION TO MATHEMATICAL STATISTICS 4
ST 511 METHODS OF DATA ANALYSIS & ST 512 and METHODS OF DATA ANALYSIS 4
& ST 513 and METHODS OF DATA ANALYSIS 4
ST 537 DATA VISUALIZATION (Via Ecampus only) 3
ST 592 STATISTICAL METHODS FOR GENOMICS RESEARCH 2 3
ST 599 SPECIAL TOPICS (Introduction to Quantitative Genomics) 1 3

Total Hours 32-42

1 No prerequisites
2 Recommended prerequisites may be waived with instructor approval
3 The following sequences qualify for Mathematics Focal Area credit: MTH 563–MTH 564, MTH 564–ST 521, ST 521–MTH 564. ST 521–ST 522 does not qualify. Only one pair of courses can be claimed for credit.
4 The following sequences qualify for Statistics Focal Area credit: ST 511–ST 513, MTH 563–MTH 564, MTH 564–ST 521, ST 521–MTH 564, or ST 521–ST 522. Only one of these sequences can be claimed for Statistics focal area credit.

Computer Science Focal Area

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB 585</td>
<td>APPLIED BIOINFORMATICS 1</td>
<td>3</td>
</tr>
<tr>
<td>CS 519</td>
<td>SELECTED TOPICS IN COMPUTER SCIENCE (Algorithms for Computational Biology) 1 1</td>
<td>3</td>
</tr>
<tr>
<td>or BB 599</td>
<td>SPECIAL TOPICS</td>
<td>1</td>
</tr>
<tr>
<td>CS 534</td>
<td>MACHINE LEARNING 2</td>
<td>4</td>
</tr>
<tr>
<td>CS 545</td>
<td>NETWORKS IN COMPUTATIONAL BIOLOGY 1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 560</td>
<td>STOCHASTIC SIGNALS AND SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>ECE 564</td>
<td>DIGITAL SIGNAL PROCESSING</td>
<td>4</td>
</tr>
<tr>
<td>FW 599</td>
<td>SPECIAL TOPICS IN FISHERIES AND WILDLIFE (Machine Learning Topics in Species Distribution Modeling) 3</td>
<td>3</td>
</tr>
<tr>
<td>MCB 599</td>
<td>SPECIAL TOPICS (Introduction to Linux and the Command Line) 2</td>
<td>2</td>
</tr>
<tr>
<td>MCB 599</td>
<td>SPECIAL TOPICS (Introduction to Python I and II) 1</td>
<td>2</td>
</tr>
<tr>
<td>MCB 599</td>
<td>SPECIAL TOPICS (Data Programming in R I and II) 1</td>
<td>2</td>
</tr>
<tr>
<td>MCB 576/BOT 576</td>
<td>INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES 1</td>
<td>3</td>
</tr>
<tr>
<td>VMB 670</td>
<td>INTRODUCTION TO SYSTEMS BIOLOGY 2</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Hours 36

1 Recommended prerequisites may be waived with instructor approval
2 No prerequisites

Note: All of the 599 classes here represent classes that are in transition to becoming regular offerings.

Certificate Code: CG11

The 18-credit graduate certificate in College and University Teaching is designed to provide advanced course work and experiential learning opportunities to current graduate students who plan to pursue careers in teaching and instruction in higher education settings or who plan to pursue careers that require similar skill sets in facilitation.

Core courses focus on educational/learning theory and instructional strategies for working with adult learners. The specialized course work includes student-selected course work, workshops, and/or other approved experiences appropriate to the student’s field of study. The supervised teaching internship will allow students to engage in supervised field experiences to practice and refine instructional skills. The capstone teaching portfolio will provide a culminating professional development experience for students.

For further information, visit the website (http://gradschool.oregonstate.edu/graduate-certificate-college-and-university-teaching/) or contact Jessica Beck, Assistant Dean of Graduate Student Development, 413 Learning Innovation Center, 541-737-8576, jessica.beck@oregonstate.edu

Certificate Code: CG11

College and University Teaching Graduate Certificate

Also available via Ecampus.
Comparative Health Sciences Graduate Major (MS, PhD)

The Comparative Health Sciences graduate major is an interdisciplinary program administered by the Graduate School. Participating colleges include Veterinary Medicine, Public Health and Human Sciences, Pharmacy, and the Graduate School.

For further information about the graduate major, contact the Graduate School and College of Veterinary Medicine.

Major Code: 9300

MS degree students complete a total of 45 graduate credits, including 12 thesis credits.

PhD degree students complete a total of 108 graduate credits beyond the bachelor’s or professional (DVM, MD) degree, including at least 36 credits of non-blanket course work.

All students complete the core curriculum and at least two electives for a total of 12 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Required Core</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research Perspectives Lab Rotations (PhD only)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ST 511 METHODS OF DATA ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Biomedical Ethics</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Grant Application Preparation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BB 550 GENERAL BIOCHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>14</td>
</tr>
</tbody>
</table>

Major Code: 9300

Biomedical Sciences Graduate Option

This option is offered within the following major(s):

- Comparative Health Sciences - Graduate School (p. 1072)

Option Code: 9305

Students must also complete the Biomedical Sciences option:

MS Students

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMB 521</td>
<td>ANIMAL MODELS</td>
<td>3</td>
</tr>
<tr>
<td>VMC 501/VMB 501</td>
<td>RESEARCH</td>
<td>5</td>
</tr>
<tr>
<td>VMC 503/VMB 503</td>
<td>THESIS</td>
<td>12</td>
</tr>
<tr>
<td>VMC 507/VMB 607</td>
<td>SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>24</td>
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<tr>
<td>Total Hours</td>
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<td>45</td>
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</tbody>
</table>

PhD Students

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMB 521</td>
<td>ANIMAL MODELS</td>
<td>3</td>
</tr>
<tr>
<td>VMB 603</td>
<td>THESIS</td>
<td>36</td>
</tr>
<tr>
<td>VMB 671</td>
<td>MOLECULAR TOOLS</td>
<td>3</td>
</tr>
<tr>
<td>VMB 607</td>
<td>SEMINAR</td>
<td>1</td>
</tr>
</tbody>
</table>

Clinical Sciences Graduate Option

This option is offered within the following major(s):

- Comparative Health Sciences - Graduate School (p. 1072)

The College of Veterinary Medicine, in collaboration with partners in the Division of Health Sciences, has established a new interdisciplinary graduate program in Comparative Health Sciences. This program offers both MS and PhD degrees and focuses on health sciences graduate education and research at the whole animal level, but will be complementary to and supportive of existing programs at the molecular and cellular level. Students are encouraged to study topics that bridge two distinct areas of study in order to benefit from the interdisciplinary structure of the program. Administered by the Graduate School, this interdisciplinary program provides an opportunity for all units within the College of Veterinary Medicine to participate in graduate education and encourages the integration of several related areas of emphasis currently existing in other units. Students are required to complete a program core curriculum as well as an option-specific curriculum. The program’s other transcript-visible option, Biomedical Sciences, is intended to accommodate students with advisors in the College of Veterinary Medicine.

The Clinical Sciences graduate option will reflect the unique program of dual clinical residents/graduate students. The purpose of this option is to educate veterinarians in the conduct of research in a specialty clinical environment, consistent with the overall goals of comparative veterinary medicine.

This option is available only to dual clinical residents/graduate students of the College of Veterinary Medicine, in conjunction with 2-, 3- or 4-year residencies in a veterinary specialty.

Option Code: 9306

Comparative Health Sciences Graduate Minor

Minor Code: 9310

Environmental Sciences

Environmental sciences consists of curricula that foster interdisciplinary education for students seeking to better understand earth systems.
The undergraduate curriculum leads to the BS degree in Environmental Sciences and requires students to complete courses that develop a broad base of knowledge in basic science disciplines, social sciences, and an area of specialization. A minor in environmental sciences is also available for those undergraduate students completing their degrees in other fields. The theme of the Environmental Sciences Program is central to the mission of OSU and reflects the strengths of OSU and other agencies and institutions in Corvallis and throughout the state of Oregon. The BS degree in Environmental Sciences provides excellent training for careers with agencies responsible for environmental protection and natural resource use, consulting firms, and those seeking opportunities for graduate studies.

### Graduate Programs

#### Major
- Environmental Sciences (p. 1074)

#### Minor
- Environmental Sciences (p. 1075)

**Carolyn Fonyo Boggess, Interim Program Director**
Environmental Sciences Graduate Program
104 Wilkinson Hall
Oregon State University
Corvallis, OR 97331
Phone: 541-737-5095
Website: http://envsci.science.oregonstate.edu/

### Environmental Sciences

**ENSC 003. UNDERGRADUATE RESEARCH. (0 Credits)**
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

**ENSC 004. INTERNSHIP. (0 Credits)**
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

**ENSC 101. ENVIRONMENTAL SCIENCES ORIENTATION. (1 Credit)**
Introduction to the Environmental Sciences Program and related professional and educational opportunities. Recommended for all freshman and first-year transfer environmental sciences majors, but open to all students interested in learning about career options in the environmental sciences. Graded P/N.

**ENSC 399. SPECIAL TOPICS. (1-16 Credits)**
Equivalent to: ENSC 399H
This course is repeatable for 16 credits.

**ENSC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)**
This course is repeatable for 24 credits.

**ENSC 402. INDEPENDENT STUDIES. (1-16 Credits)**
This course is repeatable for 24 credits.

**ENSC 403. THESIS. (1-16 Credits)**
This course is repeatable for 24 credits.

**ENSC 405. READING AND CONFERENCE. (1-12 Credits)**
Equivalent to: ENSC 405H
This course is repeatable for 16 credits.

**ENSC 406. PROJECTS. (1-16 Credits)**
This course is repeatable for 24 credits.

**ENSC 407. SEMINAR. (1-16 Credits)**
Equivalent to: ENSC 407H
This course is repeatable for 12 credits.

**ENSC 407H. SEMINAR. (1-16 Credits)**
Attributes: HNRS – Honors Course Designator
Equivalent to: ENSC 407
This course is repeatable for 12 credits.

**ENSC 408. WORKSHOP. (1-16 Credits)**
This course is repeatable for 12 credits.

**ENSC 410. ENVIRONMENTAL SCIENCE INTERNSHIP. (1-12 Credits)**
Supervised practical experience working with professionals at selected cooperating institutions, agencies, laboratories, or companies. Graded P/N.
This course is repeatable for 48 credits.

**ENSC 452. ENVIRONMENTAL ASSESSMENT. (3 Credits)**
Environmental site assessment is a primary tool for environmental science professionals. Apply environmental science concepts to evaluate features of a specific natural area and conduct a land suitability analysis. Create a conceptual site design and management plan that complies with federal, state, and local regulations and environmental laws.
Equivalent to: GEOG 452

**ENSC 479. **ENVIRONMENTAL CASE STUDIES. (3 Credits)**
Improves students’ ability to ask questions, gather and synthesize information, and communicate ideas on environmental topics. Instruction and information necessary for the course is entirely Web based. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC
Equivalent to: BOT 479
Recommended: One year of college biology or chemistry

**ENSC 499. SPECIAL TOPICS. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENSC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENSC 503. THESIS. (1-16 Credits)**
PREREQ: Departmental approval required.
This course is repeatable for 999 credits.

**ENSC 505. READING AND CONFERENCE. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENSC 506. PROJECTS. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENSC 507. SEMINAR. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENSC 508. WORKSHOP. (1-16 Credits)**
PREREQ: Departmental approval required.
This course is repeatable for 16 credits.

**ENSC 510. INTERNSHIP. (1-12 Credits)**
This course is repeatable for 12 credits.
ENSC 515. ENVIRONMENTAL PERSPECTIVES AND METHODS. (3 Credits)
Unique perspective or method each quarter. Possibilities include: remote sensing, modeling over a range of scales in time, space, and levels of system organization; and risk analysis.

ENSC 516. USING BEST PRACTICES IN ENVIRONMENTAL PROJECT MANAGEMENT. (4 Credits)
Explore foundational project management concepts using a real world case-study to practice both soft and hard skills through individual and group assignments, discussions and presentations. Apply best practices, methodologies and tools using a global standards framework to achieve successful outcomes in environmental project management work. Active learning and networking are incorporated throughout the course to provide a full perspective on project management.

ENSC 520. ENVIRONMENTAL ANALYSIS. (3 Credits)
Develop analytical thinking, explore analytical approaches, enhance writing skills, and gain experience in oral communication about environmental issues.

ENSC 540. ENVIRONMENTAL SCIENCE PERSPECTIVES ON THE FUTURE OF FOOD. (4 Credits)
Examines the newest developments in environmental science research and on-the-ground best management practices for achieving food security and sustainability for growing U.S. and global populations in a dynamic environment and climate.

ENSC 541. ENVIRONMENTAL SCIENCE, SCIENTISTS, AND SOUND DECISIONS. (4 Credits)
Focusing on analyzing the role of environmental science and scientists in decision-making in a variety of professional contexts at various scales (local through global) using a case-study approach and proposing a draft model process.

ENSC 542. MANAGEMENT OPPORTUNITIES IN THE NITROGEN CASCADE. (4 Credits)
Analyzes the environmental science behind reducing excess reactive nitrogen entering the environment through our provision of food, power, and transportation for future populations. Identifies emerging complementary suites of interventions and legislation innovating management practices at local, regional, national and international scales.

ENSC 543. EXCELling IN AN INTERDISCIPLINARY TEAM. (4 Credits)
Identifying, examining and practicing the top skills, attributes and leadership dynamics involved in working in interdisciplinary environmental science teams in industry, government, and research organizations, informed by experienced experts across these areas.

ENSC 555X. FOOD FOR CHANGE. (3 Credits)
Focusing on traditional regional recipes, explore and document how global change has affected food production and demand until today and how projected climate change will affect it in the future by analyzing the ingredient lists. Focus on one recipe/ingredient, find maps of past/current crop ranges, document changes, and identify possible replacement ingredients projecting future culinary solutions.

Recommended: GEOG 472

ENSC 599. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENSC 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 699. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Environmental Sciences Graduate Major (MA, MS, PhD, PSM)

Graduate Areas of Concentration

Biogeochemistry, ecology, environmental education, natural resources, quantitative analysis, social science, water resources, climate change

PSM also available via Ecampus.

The Environmental Sciences (ES) Graduate Program provides curricula leading to MA, MS (Corvallis campus and Ecampus), PSM (Corvallis campus and Ecampus), and PhD degrees in Environmental Sciences. The MS degree, non-thesis option, and PSM degree in Environmental Sciences are available via Ecampus in addition to OSU Main – Corvallis.

The curriculum integrates thinking across disciplines, especially life, physical, and social sciences. Environmental science explores natural processes on earth and their alteration by human activity. OSU has exceptional strength in many of the disciplines, including science, agriculture, forestry, engineering, public health, liberal arts, social science, and oceanography and atmospheric science. Strength in these disciplines allows the ES Graduate Program to provide high-quality interdisciplinary education for environmental scientists and continuing postgraduate educational opportunities to scientists who are already active in the field. The degrees administered by the program are OSU’s contribution to the Joint-Campus Graduate Program in Environmental Sciences, Studies, and Policy, which links environmental graduate programs among the major research universities in Oregon.

The ES Graduate Program develops scientists who will be able to analyze and understand environmental systems, predict environmental change, and participate in the management of the environment. Each student completing a major in the ES Graduate Program will perform research and complete a thesis, dissertation, or research project. Each student will complete a core of ES graduate courses that will integrate concepts across the physical sciences, life sciences, and social sciences. Each student will also develop depth in a carefully designed, interdisciplinary area of concentration or track. Tracks that are currently available include ecology, biogeochemistry, social science, quantitative analysis, water resources, and environmental education. Methods and numerical skill courses, electives, and thesis or non-thesis project credits comprise the remainder of a student’s program.

Students in the ES Graduate Program may choose advisors from faculty members already appointed at OSU, as well as other scientists who apply and are accepted in the environmental sciences graduate faculty. The Environmental Sciences Graduate Program fosters interdisciplinary education and seeks connections between institutions.
Professional Science Master’s (PSM) Degree in Environmental Sciences

The Professional Science Master’s degree in Environmental Sciences (PSM@ENSC) provides advanced training for early- and mid-career professionals with a need for expertise in environmental sciences. Preferably applicants would have at least two years of experience working in the environmental field, but this is not mandatory for admission. The PSM@ENSC degree is offered as a non-thesis Master’s degree program with an internship. Students have an advisor and graduate committee to review their program of study, provide career and internship advice, and evaluate a final report based on the internship experience.

Carolyn Fonyo, Director
Environmental Sciences Graduate Program
104 Wilkinson Hall
Corvallis, OR 97331
Email: carolyn.fonyo@oregonstate.edu
Website: http://psm.science.oregonstate.edu/environmental-sciences

Major Code: 6420

MA and MS Degrees

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**Note:** The MA degree requires proficiency in a foreign language.

PhD Degree

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PSM Degrees Requirements

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<td>Numerical skills</td>
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<td>Environmental Sciences track electives</td>
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For general information about the PSM@ENSC degree option, visit the website or contact the Interim Director of Environmental Sciences, Carolyn Fonyo Boggess at carolyn.fonyo@oregonstate.edu or 541-760-4196.

Course substitutions must be approved by the program advisor. Many of our courses are offered through Ecampus, but some may be offered through Corvallis, Cascades or Hatfield Marine Science Center. Please check course offerings through the online catalog or consult with the program advisor.

Major Code: 6420

Environmental Sciences Graduate Minor

Minor Code: 6421

Minor Code: 6421

Interdisciplinary Studies Graduate Major (MAIS)

Graduate Areas of Concentration

Selected from three participating fields offering graduate majors and minors

The Master of Arts in Interdisciplinary Studies (MAIS) degree program is designed to permit students to formulate programs that integrate work from three separate disciplines. Breadth of study is important in designing the program. A research paper or thesis offers the opportunity to integrate the three disciplines.

Many programs at OSU participate in the MAIS program. Please consult the MAIS program director to determine specific program participation.

Graduate programs that are participating in this degree are listed in the Graduate School website (http://gradschool.oregonstate.edu/programs/+).

Admission

The applicant must satisfy university admission requirements at the graduate level and must gain acceptance at the point of admission by the departments offering the fields that will make up the program.

Administration

The Graduate School will handle general administration and recordkeeping. Students with general questions about the MAIS degree are encouraged to confer with the director of the MAIS graduate program.

The student should select a committee in consultation with the department/school chair of the emphasized field or with their designated representative. With the advice of the committee chair, the student will select a committee member from each of the remaining two fields. The student will select the fourth committee member, a Graduate Council representative, from a list of names to be obtained in the Graduate School office. All members of the committee must be on the graduate faculty.

Before the completion of 18 credits of graduate course work, the student must file the official program form, approved by the committee. Program planning meetings are required, and the student has the responsibility for arranging the committee meetings necessary in the planning of the program. In the event that the student subsequently desires to change one or more disciplines on their program, the student must file a change in degree program with the Graduate School and schedule another program meeting in order to gain committee approval.

For more information, contact the Director.
Major Code: 9900

The Master of Arts in Interdisciplinary Studies (MAIS) degree is granted for attainment of broad, advanced knowledge and achievement integrated from three fields of study. Any graduate major or minor may serve as a field for this degree. Two of the three fields may be from one department if the areas of concentration within these two fields are different. A minimum of 9 credits in each of the three fields of study is required. The degree requires a minimum of 49 credits, including 4 credits of course work on interdisciplinary research methods.

No more than 21 credits (excluding thesis or research paper credit) may be taken in any field unless the total program exceeds 49 credits. There is no foreign language requirement. No more than 3 credits of blanket-numbered courses in each field of study may be used in the program; thesis credits (Option A) or research paper credits (Option B) are exempt from this limitation. The student’s committee consists of four members of the graduate faculty—one from each of the three fields—and a Graduate Council representative. A formal program meeting must be held prior to the completion of 18 graduate credits. A final oral examination is required.

There are two options under the program:

Option A: Thesis option. The thesis must coordinate work in the three fields. The requirement is 6 to 9 credits of Thesis 503. The thesis advisor must be a member of the graduate faculty authorized to direct theses.

Option B: Research paper option. The research paper must integrate work from at least two of the three fields. The requirement is 4 to 7 credits, registered as Research 501, Reading and Conference 505, or Projects 506.

Major Code: 9900

Molecular and Cellular Biology

The Molecular and Cellular Biology Program provides students with comprehensive interdisciplinary training in molecular and cellular biology while reserving sufficient flexibility for students to specialize in their areas of interest. The elements of the core curriculum include courses in molecular genetics and cell structure and function, bioinformatics and genomics, scientific skills and ethics, along with research rotations with individual faculty members. Additional course work is custom-tailored to the individual student’s interests and needs. Each program requires 36 units of graduate-level course work, participation in seminar programs, two quarters of supervised teaching experience, written and oral preliminary examinations, supervision by an individual committee of five faculty members, and presentation of a thesis containing the results of publishable original research.

The program also offers access to all of the participating faculty as potential research advisors. Students do three research rotations in the first year and select their advisor from over 90 faculty members in the 20 participating departments in seven colleges. Therefore, the MCB Program lowers interdisciplinary barriers and allows the students to select the advisors that most closely match their interests after they have been on campus for one or more terms.

Graduate Programs

Major

- Molecular and Cellular Biology (p. 1078)

Minor

- Molecular and Cellular Biology (p. 1078)

Dee Denver, Director
Molecular and Cellular Biology
3021 Agricultural and Life Sciences Building
Oregon State University
Corvallis, OR 97331
Phone: 541-737-3799
Email: denvedee@cgrb.oregonstate.edu
Website: http://www.mcb.oregonstate.edu

Affiliate Faculty

Over ninety faculty members drawn from 20 departments in seven colleges participate in the MCB program.

Molecular & Cellular Biology

MCB 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 99 credits.

MCB 503. THESIS. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 999 credits.

MCB 505. READING AND CONFERENCE. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 99 credits.

MCB 507. SEMINAR. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 99 credits.

MCB 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

MCB 509. PRACTICUM. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 99 credits.

MCB 510. INTERNSHIP. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 99 credits.

MCB 525. TECHNIQUES IN MOLECULAR AND CELLULAR BIOLOGY. (3 Credits)
An intensive laboratory course introducing modern methods for the manipulation of cellular macromolecules. Recombinant DNA technology, protein chemistry, and in situ hybridization methods presented in a format that emphasizes experimental continuity. The course requires two weeks of intensive full-time involvement.
MCB 530. INTRODUCTION TO POPULATION GENETICS. (3 Credits)
Genetic polymorphisms, inbreeding, genetic drift, population subdivision and gene flow, mutation and selection. Emphasis on applied rather than theoretical questions. Offered alternate years.
Equivalent to: GEN 530
Recommended: BI 311 and ST 351 and ST 352

MCB 535. GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535.
Equivalent to: BI 535, FES 535, FS 535, TOX 535
Recommended: One quarter each of biology and chemistry

MCB 541. PLANT TISSUE CULTURE. (4 Credits)
Principles, methods, and applications of plant tissue culture. Laboratory is important part of course. Topics include callus culture, regeneration, somaclonal variation, micropropagation, anther culture, somatic hybridization, and transformation. CROSSLISTED as PBB 441 and MCB 541/PBB 541.
Equivalent to: HORT 541, PBB 541
Recommended: (BI 311 and BOT 331) or PBB 430

MCB 554. GENOME ORGANIZATION, STRUCTURE, AND MAINTENANCE. (4 Credits)
How diverse organisms store their individual sets of genetic information (genomes). Evolution of genomes and gene families. Structures of DNA and chromatin. Biochemical and regulatory pathways that protect cellular genomes against environmental and endogenous damage and ensure transmission of faithful copies to progeny. Remodeling of genomes by recombination and transposition.
Equivalent to: GEN 554, MB 554, TOX 554
Recommended: (BI 311 and BOT 331) or PBB 430

MCB 555. GENOME EXPRESSION AND REGULATION. (4 Credits)
Prokaryotic and eukaryotic systems will be used to describe recent advances in understanding transcriptional and posttranscriptional control mechanisms. Topics include: microbial, yeast and mouse model systems; transcriptional control mechanisms; RNA processing, silencing and microRNAs; protein synthesis and posttranslational modification; microarray- and mass spectrometry-based expression genomics.
Equivalent to: GEN 555
Recommended: BB 451

MCB 557. SCIENTIFIC SKILLS AND ETHICS. (3 Credits)
Offered instruction, guest lectures and case-study based discussions of pertinent to life sciences. CROSSLISTED as BOT 554/MB 554.
Recommended:

MCB 575. COMPARATIVE GENOMICS. (4 Credits)
Equivalent to: BOT 575
Recommended: Basic working knowledge of cell and molecular biology and genetics. BI 314 and (BI 311 or CSS 430)

MCB 576. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)
Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences. CROSSLISTED as BOT 576/MCB 576.
Equivalent to: BOT 576
Recommended: Cell and molecular biology or genetics and familiarity with text editing software and unix/linux operating system

MCB 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

MCB 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MCB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MCB 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MCB 609. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

MCB 610. INTERNSHIP. (1-9 Credits)
Laboratory rotation.

This course is repeatable for 16 credits.

MCB 620. DNA FINGERPRINTING. (1 Credit)
Principles and methods for producing and analyzing DNA fingerprints. Offered alternate years. CROSSLISTED as MCB 620/PBG 620.
Equivalent to: CSS 620, GEN 620, PBB 620
Recommended: (BI 311 or CSS 430 or CSS 530 or PBB 430 or PBB 530 or HORT 430 or HORT 530

MCB 621. GENETIC MAPPING. (1 Credit)
Principles and methods for constructing genetic maps comprised of molecular and other genetic markers. Offered alternate years. CROSSLISTED as MCB 621/PBG 621.
Equivalent to: CSS 621, GEN 621, PBB 621
Recommended: BI 311 or CSS 430 or CSS 530 or PBB 430 or PBB 530 or HORT 430 or HORT 530

MCB 622. MAPPING QUANTITATIVE TRAIT LOCI. (1 Credit)
Principles and methods for mapping genes underlying phenotypically complex traits. Offered alternate years. CROSSLISTED as MCB 622/PBB 622.
Equivalent to: CSS 622, GEN 622, PBB 622
Recommended: CSS 590 or ST 513

MCB 637. MOLECULAR HOST-MICROBE INTERACTIONS. (3 Credits)
Lecture and discussion-based presentation of the molecular bases for interactions between organisms. Addresses bacterial, algal, and fungal symbionts of eukaryotes and considers pathogenesis, commensalism, and mutualism. A focus on the evolution of host-microbe interactions is included.
MCB 662. HORMONE ACTION. (3 Credits)
Mechanisms of action of peptide and steroid hormones and related compounds at the cellular level. Offered every other year, winter term. CROSSLISTED as ANS 662/MCB 662.
Prerequisites: BB 451 with C or better or BB 551 with C or better or BB 492 with C or better or BB 592 with C or better
Equivalent to: PHAR 662

MCB 671. MOLECULAR TOOLS. (3 Credits)
Intended for personnel with some scientific background who are seeking basic- and advanced-level molecular biology knowledge and who wish to become involved with molecular biology-related and biotechnological research. CROSSLISTED as MCB 671/VMB 671.
Equivalent to: VMB 671

MCB 699. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

Molecular and Cellular Biology Graduate Major (MS, PhD)
Graduate Areas of Concentration
Bioinformatics, biotechnology, cell biology, developmental biology, genome biology, molecular biology, molecular pathogenesis, molecular virology, plant molecular biology, structural biology

MCB doctoral students do research rotations in three laboratories during the first year, and then carry out their thesis research in subsequent years under the direction of a member of the MCB faculty. The MCB Program lowers interdisciplinary barriers and allows each individual the opportunity to select the most suitable advisor and committee.

For more information, contact:
Dee Denver, Director
Molecular and Cellular Biology
3021 Agricultural and Life Sciences Building
Oregon State University
Corvallis, OR 97331
541-737-3799
Email: denvedee@cgrb.oregonstate.edu and millimag@cgrb.oregonstate.edu
Website: http://www.mcb.oregonstate.edu and http://psm.science.oregonstate.edu/applied-biotechnology/

Major Code: 9950
Minor Code: 9950

Water Resources Engineering
Graduate Areas of Concentration
Groundwater engineering, surface water engineering, watershed engineering

A graduate major or minor in Water Resources Engineering for the master of science, master of arts, and doctor of philosophy degree programs is offered with specialization in groundwater engineering, surface water engineering, or watershed engineering. Seminars, courses, and reading and conference courses in water resources engineering are offered by the Water Resources Graduate Program.

The graduate major or minor options are structured around courses designed to broaden the student's education in one of the above areas of concentration. University departments and schools that offer courses related to water resources engineering include the departments of Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Chemistry; Crop and Soil Science; Geosciences; Mathematics; Rangeland Ecology and Management; Statistics; the School of Forest Engineering, Resources and Management; the School of Biological and Population Health Sciences; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit http://oregonstate.edu/gradwater/.

Graduate Programs
Major
• Water Resources Engineering (p. 1079)

Minor
• Water Resources Engineering (p. 1080)

Mary Santelmann, Director
Water Resources Graduate Program
116 Gilmore Hall
Oregon State University
Corvallis, OR 97331
541-737-1215
Email: santelmm@oregonstate.edu
Website: http://oregonstate.edu/gradwater/
Water Resources Engineering

WRE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 510. INternship. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

WRE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 610. INternship. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Water Resources Engineering Graduate Major (MS, PhD)

Graduate Areas of Concentration

Groundwater engineering, surface water engineering, watershed engineering

A graduate major in Water Resources Engineering for the master of science and doctor of philosophy degree programs is offered with specialization in groundwater engineering, surface water engineering, or watershed engineering. Seminars, courses, and reading and conference courses in water resources engineering are offered by the Water Resources Graduate Program.

The graduate major options are structured around courses designed to broaden the student’s education in one of the above areas of concentration. University departments and schools that offer courses related to water resources engineering include the departments of Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Chemistry; Crop and Soil Science; Geosciences; Mathematics; Rangeland Ecology and Management; Statistics; the School of Forest Engineering, Resources and Management; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Major Code: 3100

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Groundwater Engineering

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<td>BEE 533</td>
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<td>BEE 542</td>
<td>VADOSE ZONE TRANSPORT</td>
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<td>CE 514</td>
<td>GROUNDWATER HYDRAULICS</td>
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<td>ENVE 554</td>
<td>GROUNDWATER REMEDIATION</td>
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<td>GPH 665</td>
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Surface Water Engineering

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<td>BEE 546</td>
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<td>4</td>
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<tr>
<td>CE 518</td>
<td>GROUNDWATER MODELING</td>
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<tr>
<td>CE 543</td>
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<tr>
<td>FE 536</td>
<td>FOREST DISTURBANCE HYDROLOGY</td>
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Watershed Engineering

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>ATS 564</td>
<td>INTERACTIONS OF VEGETATION AND ATMOSPHERE</td>
<td>3</td>
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<tr>
<td>BEE 512</td>
<td>PHYSICAL HYDROLOGY</td>
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</tr>
<tr>
<td>BEE 525</td>
<td>STOCHASTIC HYDROLOGY</td>
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</tr>
<tr>
<td>BEE 529</td>
<td>BIOSYS MODELING TECHNIQUES</td>
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<tr>
<td>BEE 549</td>
<td>REGIONAL HYDROLOGIC MODELING</td>
<td>3</td>
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<tr>
<td>CE 517</td>
<td>HYDRAULIC ENGINEERING DESIGN</td>
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</tr>
<tr>
<td>CE 547</td>
<td>WATER RESOURCES ENGINEERING I: PRINCIPLES OF FLUID MECHANICS</td>
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</tr>
<tr>
<td>CE 548</td>
<td>WATER QUALITY DYNAMICS</td>
<td>3</td>
</tr>
<tr>
<td>ENVE 521</td>
<td>DRINKING WATER TREATMENT PROCESSES</td>
<td>4</td>
</tr>
<tr>
<td>ENVE 531</td>
<td>FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS</td>
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</tr>
<tr>
<td>ENVE 532</td>
<td>AQUATIC CHEMISTRY NATURAL AND ENGINEERED SYSTEMS</td>
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<tr>
<td>FE 530</td>
<td>WATERSHED PROCESSES</td>
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<tr>
<td>FE 532</td>
<td>FOREST HYDROLOGY</td>
<td>4</td>
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</table>

Total Hours: 106

Major Code: 3100
Water Resources Engineering Graduate Minor

Graduate Areas of Concentration

Groundwater engineering, surface water engineering, watershed engineering

A graduate minor in Water Resources Engineering for the master of science, master of arts, and doctor of philosophy degree programs is offered with specialization in groundwater engineering, surface water engineering, or watershed engineering. Seminars, courses, and reading and conference courses in water resources engineering are offered by the Water Resources Graduate Program.

The graduate minor options are structured around courses designed to broaden the student's education in one of the above areas of concentration. University departments and schools that offer courses related to water resources engineering include the departments of Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Chemistry; Crop and Soil Science; Geosciences; Mathematics; Rangeland Ecology and Management; Statistics; the School of Forest Engineering, Resources and Management; the School of Biological and Population Health Sciences; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Minor Code: 3100

Water Resources Policy and Management

For more information, email gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Minor Code: 0990

Graduate Programs

Major

- Water Resources Policy and Management (p. 1081)

Minor

- Water Resources Policy and Management (p. 1082)

Mary Santelmann, Director
Water Resources Graduate Program
116 Gilmore Hall
Oregon State University
Corvallis, OR 97331
541-737-1215
Email: santelmm@oregonstate.edu
Website: http://oregonstate.edu/gradwater/

Water Resources Policy and Management

WRP 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRP 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 509. PRACTICUM. (1-16 Credits)
This non-traditional class explores tools, models and concepts in the collaborative decision-making process in water resources. Emphasis is on group projects and self-directed practical application of community-based natural resources.
This course is repeatable for 16 credits.

WRP 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 517. WRITING IN WATER RESOURCES. (4 Credits)
An intensive summer course to develop proficiency in writing at a graduate level for the wide range of writing tasks common to water resource professionals. Students will complete individual in-class writing assignments and collaborate on a draft of a technical report. While it is designed for students in the Water Cooperation and Peace joint degree program (many of whom will be international students) the course will also be useful for other students. Lec/rec.

WRP 521. WATER CONFLICT MANAGEMENT AND TRANSFORMATION. (3 Credits)
Examines ways to work effectively in contentious water situations. Explores conflict tolerance, prevention, management, and transformation through collaborative structures as well as through models of negotiation and dialogue.

WRP 523. ENVIRONMENTAL WATER TRANSACTIONS. (3 Credits)
Covers the theory and practice of using water rights transactions to reallocate water rights to environmental purposes. Different transactional techniques and contexts appropriate to their use are presented through case studies primarily from the western United States, with some reference to the use transactions in other countries such as Australia.

WRP 524. SOCIOTECHNOLOGICAL ASPECTS OF WATER RESOURCES. (3 Credits)
Core curriculum, graduate-level course in the Water Resources Graduate Program focusing on an interdisciplinary approach to water resources research that integrates the human and the technological dimensions of water resource issues. It is comprised of lecture and discussion sessions with guest lectures by visiting seminar speakers.
WRP 544. MANAGING NATURAL RESOURCES FOR CLIMATE ADAPTATION. (3 Credits)
Students will work through series of case studies in resource management to identify strategies and approaches that promote or prevent resilience in resource management. Students participate in discussions and hands-on activities in addition to the lectures and will prepare daily reflections, a final reflection and a final essay due one week after the end of the classroom sessions. This course will use a lecture and discussion format, and draw from the international expertise of the instructor and guest lecturers.

WRP 548. CONDUCTING COLLABORATIVE PROJECTS. (3 Credits)
Focuses on development of the abilities needed to complete a directed water-related collaborative project, delivered through experiential learning. The course specifically addresses development of collaborative skills needed to work in interdisciplinary teams. The course activities are centered around a collaborative project on which students will be conducting research, collecting data synthesizing information; and providing classmates with constructive peer-review. Lec/rec.

WRP 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 808. WORKSHOP. (1-4 Credits)
Examines ways to work effectively in contentious water situations. Explores conflict tolerance, prevention, management, and transformation through collaborative structures as well as through models of negotiation and dialogue.
This course is repeatable for 4 credits.

Water Resources Policy and Management Graduate Major (MS)

Graduate Areas of Concentration

Water resources policy and management

A Masters Degree in Water Resources Policy and Management is offered with specialization in the human dimensions of water resources policy and management. Seminars, readings, and conferences in water resources policy and management are offered by Water Resources Graduate Program and several affiliated departments.

The graduate degree options are structured around courses designed to broaden the student’s education in water resources policy and management. University departments that offer courses related to water resources policy and management include the departments of Applied Economics; Anthropology; Fisheries and Wildlife; Geosciences; Rangeland Ecology and Management; Statistics; and Zoology; the School of Public Policy; the School of Forest Engineering, Resources and Management; the School of Biological and Population Health Sciences; the College of Business Administration, and the College of Earth, Ocean, and Atmospheric Sciences.

For more information, email gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Major Code: 0990

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<td>or WRS 507</td>
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<td>WRP 505</td>
<td>READING AND CONFERENCE</td>
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<td>or WRS 507</td>
<td>SEMINAR</td>
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<td>WRP 524</td>
<td>SOCIOTECHNOLOGICAL ASPECTS OF WATER RESOURCES</td>
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Methods and Numerical Skills

Select 9 credits of the following:

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<td>CS 540</td>
<td>DATABASE MANAGEMENT SYSTEMS</td>
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<tr>
<td>GEDG 560</td>
<td>GISCIENCE I: INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE</td>
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<tr>
<td>GEDG 565</td>
<td>SPATIO-TEMPORAL VARIATION IN ECOLOGY AND EARTH SCIENCE</td>
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<tr>
<td>ST 511</td>
<td>METHODS OF DATA ANALYSIS</td>
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<td>ST 512</td>
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<td>ST 513</td>
<td>METHODS OF DATA ANALYSIS</td>
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<tr>
<td>ST 531</td>
<td>SAMPLING METHODS</td>
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Basic Water Science

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<td>ATS 520</td>
<td>PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE</td>
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<td>BEE 512</td>
<td>PHYSICAL HYDROLOGY</td>
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<td>CE 514</td>
<td>GROUNDWATER HYDRAULICS</td>
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<td>FE 530</td>
<td>WATERSHED PROCESSES</td>
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<td>GED 530</td>
<td>GEOCHEMISTRY</td>
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<td>GED 531</td>
<td>ENVIRONMENTAL GEOCHEMISTRY</td>
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<tr>
<td>GED 532</td>
<td>APPLIED GEOMORPHOLOGY</td>
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<td>GEDG 596</td>
<td>FIELD RESEARCH IN GEOMORPHOLOGY AND LANDSCAPE ECOLOGY</td>
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<td>SOIL 535</td>
<td>SOIL PHYSICS</td>
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Policy and Management

Select 15 credits of the following:

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<tr>
<td>AEC 505</td>
<td>READING AND CONFERENCE (Resource Economics)</td>
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<td>or AEC 507</td>
<td>SEMINAR</td>
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<tr>
<td>AEC 512</td>
<td>MICROECONOMIC THEORY I</td>
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<td>AEC 525</td>
<td>APPLIED ECONOMETRICS</td>
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<tr>
<td>AEC 534</td>
<td>ENVIRONMENTAL AND RESOURCE ECONOMICS</td>
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<tr>
<td>AEC 543</td>
<td>INTERNATIONAL TRADE</td>
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<tr>
<td>AEC 550</td>
<td>ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS</td>
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<tr>
<td>AEC 551</td>
<td>APPLICATIONS OF ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS</td>
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<tr>
<td>ANTH 576</td>
<td>ADVANCED ANTHROPOLOGICAL THEORY SEMINAR</td>
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<tr>
<td>ANTH 577</td>
<td>ECOLOGICAL ANTHROPOLOGY</td>
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<td>ANTH 585</td>
<td>USES OF ANTHROPOLOGY</td>
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<td>ANTH 591</td>
<td>ETHNOGRAPHIC METHODS</td>
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<td>COMM 540</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
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<td>COMM 546</td>
<td>COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES</td>
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<tr>
<td>FOR 562</td>
<td>NATURAL RESOURCE POLICY AND LAW</td>
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<td>FOR 563</td>
<td>ENVIRONMENTAL POLICY AND LAW INTERACTIONS</td>
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<td>GED 532</td>
<td>APPLIED GEOMORPHOLOGY</td>
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<tr>
<td>GEDG 530</td>
<td>RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT</td>
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<tr>
<td>GEDG 540</td>
<td>WATER RESOURCES MANAGEMENT IN THE UNITED STATES</td>
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<td>GEDG 541</td>
<td>THE WORLD’S WATER</td>
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<tr>
<td>PS 575</td>
<td>ENVIRONMENTAL POLITICS AND POLICY</td>
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<tr>
<td>PS 576</td>
<td>SCIENCE AND POLITICS</td>
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<tr>
<td>PS 577</td>
<td>INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY</td>
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<tr>
<td>SOC 556</td>
<td>SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT</td>
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</table>
Water Resources Policy and Management Graduate Minor

Graduate Areas of Concentration

Water resources policy and management

A graduate minor in Water Resources Policy and Management for the master of science, master of arts, and doctor of philosophy degree programs is offered with specialization in the human dimensions of water resources policy and management. Seminars, readings, and conferences in water resources policy and management are offered by Water Resources Graduate Program and several affiliated departments.

The graduate minor options are structured around courses designed to broaden the student's education in water resources policy and management. University departments that offer courses related to water resources policy and management include the departments of Applied Economics; Anthropology; Fisheries and Wildlife; Geosciences; Rangeland Ecology and Management; Statistics; and Zoology; the School of Public Policy; the School of Forest Engineering, Resources and Management; the School of Biological and Population Health Sciences; the College of Business Administration, and the College of Earth, Ocean, and Atmospheric Sciences.

For more information, email gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Minor Code: 0990

Water Resources Science

A graduate major or minor in Water Resources Science for master of science, master of arts, and doctor of philosophy degree programs is offered with specialization in hydrology or geochemistry. Seminars, readings, and conferences are offered by the Water Resources Graduate Program.

The graduate minor options are structured around courses designed to broaden the student's education in water resources science, specifically in hydrology or geochemistry. University departments and schools that offer courses related to water resources science include the departments of Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Chemistry; Crop and Soil Science; Entomology; Fisheries and Wildlife; Geosciences; Mathematics; Microbiology; Rangeland Ecology and Management; Statistics; and Zoology; and the School of Forest Engineering, Resources and Management; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; the School of Public Policy; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit http://oregonstate.edu/gradwater/.

Major Code: 0990

Graduate Programs

Water Resources Policy and Management

Major

- Water Resources Science (p. 1083)

Minors

- Water Resources (p. 1083)
- Water Resources Science (p. 1084)

Mary Santelmann, Director

Water Resources Graduate Program
116 Gilmore Hall
Oregon State University
Corvallis, OR 97331
541-737-1215
Email: santelmm@oregonstate.edu
Website: http://oregonstate.edu/gradwater/

Water Resources Science

WRS 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 532. APPLIED FIELD PROBLEMS. (3 Credits)
Introduces graduate students to real-world water resources problems and approaches to solving them. Students will assess and analyze the various constraints and limitations to integrated water management that often cannot be adequately simulated in classroom exercises. They will acquire the practical tools necessary to become effective water resources professionals in a rapidly changing world.

WRS 536. FUNDAMENTALS OF HYDROLOGY. (3 Credits)
Teaches students from a non-technical background in the Water Cooperation and Peace program the fundamentals of hydrology. Students will be introduced to hydrology and the hydrological cycle at the graduate level with a focus on key concepts. Students will apply these concepts to understanding of real world problems in the associated course, WRS 532, Applied Field Problems. Lec/lab.

WRS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRS 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
Water Resources Graduate Minor

Graduate Areas of Concentration

Hydrology, water quality, water resources planning and management

A Water Resources graduate minor for the master of science, master of arts, and doctor of philosophy degree programs is offered with specialization in hydrology, water quality, or water resources planning and management. The first two options are technically oriented while the third gives added socioeconomic emphasis. Seminars, readings, and conferences are offered by Water Resources Graduate Program.

The graduate minor options are structured around core groups of courses and complementary courses designed to broaden the student's education. University departments and schools that offer courses related to water resources include the departments of Applied Economics; Anthropology; Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Business Administration; Chemistry; Crop and Soil Science; Entomology; Fisheries and Wildlife; Forest Engineering; Forest Resources; Mathematics; Microbiology; Public Health; Rangeland Ecology and Management; Statistics; and Zoology; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; School of Public Policy; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Minor Code: 3990

Minor Code: 3990

Water Resources Science Graduate Major (MS, PhD)

Graduate Areas of Concentration

Water resources science

A graduate major in Water Resources Science for master of science and doctor of philosophy degree programs is offered with specialization in hydrology or geochemistry. Seminars, readings, and conferences are offered by the Water Resources Graduate Program.

The graduate major options are structured around courses designed to broaden the student's education in water resources science, specifically in hydrology or geochemistry. University departments and schools that offer courses related to water resources science include the departments of Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Chemistry; Crop and Soil Science; Entomology; Fisheries and Wildlife; Geosciences; Mathematics; Microbiology; Rangeland Ecology and Management; Statistics; and Zoology; and the School of Forest Engineering, Resources and Management; the School of Biological and Population Health Sciences; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; the School of Public Policy; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Major Code: 3530

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<tr>
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<td>SEMINAR</td>
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<tr>
<td>WRP 505</td>
<td>READING AND CONFERENCE or WRE 505</td>
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<td>or WRS 505</td>
<td>READING AND CONFERENCE</td>
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<td>WRP 507</td>
<td>SEMINAR (Water Resources Seminar and Journal Club) or WRS 507</td>
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<td>SEMINAR</td>
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<tr>
<td>WRP 524</td>
<td>SOCIO-TECHNOLOGICAL ASPECTS OF WATER RESOURCES</td>
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Water Resources Science Courses

Select 12 credits of the following for MS or 15 credits of the following for PhD: 12-15

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<td>PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE</td>
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<td>ATS 564</td>
<td>INTERACTIONS OF VEGETATION AND ATMOSPHERE</td>
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<td>STOCHASTIC HYDROLOGY</td>
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<td>BEE 533</td>
<td>IRRIGATION SYSTEM DESIGN</td>
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<td>BEE 542</td>
<td>VADOSE ZONE TRANSPORT</td>
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<td>BEE 544</td>
<td>OPEN CHANNEL HYDRAULICS</td>
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<td>BEE 546</td>
<td>RIVER ENGINEERING</td>
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<td>BEE 549</td>
<td>REGIONAL HYDRODYNAMICS AND MODELLING</td>
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<td>HYDRAULIC ENGINEERING DESIGN</td>
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<td>CE 548</td>
<td>WATER QUALITY DYNAMICS</td>
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<td>DRINKING WATER TREATMENT PROCESSES</td>
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<td>GROUNDWATER REMEDIATION</td>
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<td>WATERSHED PROCESSES</td>
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<td>FOREST HYDROLOGY</td>
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<td>FW 556</td>
<td>FRESHWATER ECOSYSTEMS AND CONSERVATION</td>
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<td>STREAM ECOLOGY</td>
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<td>GEOCHEMISTRY</td>
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<td>GEO 531</td>
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<td>GEO 532</td>
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<td>GEO 535</td>
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<td>GEO 580</td>
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<td>GEO 596</td>
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<td>MB 548</td>
<td>MICROBIAL ECOLOGY</td>
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<td>OC 670</td>
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<tr>
<td>RNG 555</td>
<td>RIPARIAN HYDROLOGY AND MANAGEMENT</td>
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Water Resources Science Graduate Minor

Graduate Areas of Concentration

Water resources science

A graduate minor in Water Resources Science for master of science, master of arts, and doctor of philosophy degree programs is offered with specialization in hydrology or geochemistry. Seminars, readings, and conferences are offered by the Water Resources Graduate Program.

The graduate minor options are structured around courses designed to broaden the student’s education in water resources science, specifically in hydrology or geochemistry. University departments and schools that offer courses related to water resources science include the departments of Biochemistry and Biophysics; Biological and Ecological Engineering; Botany and Plant Pathology; Chemistry; Crop and Soil Science; Entomology; Fisheries and Wildlife; Geosciences; Mathematics; Microbiology; Rangeland Ecology and Management; Statistics; and Zoology; and the School of Forest Engineering, Resources and Management; the School of Biological and Population Health Sciences; the School of Chemical, Biological, and Environmental Engineering; the School of Civil and Construction Engineering; the School of Mechanical, Industrial, and Mechanical Engineering; the School of Public Policy; and the College of Earth, Ocean, and Atmospheric Sciences. About 20 departments conduct teaching or research programs in water resources.

For more information, contact gradwater_director@oregonstate.edu or visit the website (http://oregonstate.edu/gradwater/).

Minor Code: 3530

International Programs

Office of International Services (OIS)

Grace Atebe, Director
University Plaza
1600 SW Western Blvd., Suite 130
Oregon State University
Corvallis, Oregon 97333
Phone: 541-737-6310
Email: grace.atebe@oregonstate.edu
Website: http://international.oregonstate.edu/ouis/

The Office of International Services (formerly International Student Advising and Services, and International Scholar and Faculty Services) collaborates with campus and community partners to support the success and retention of all OSU international visitors from approximately 100 different countries. This includes over 500 international faculty and staff, and over 4,000 students in degree, exchange and INTO OSU (English Language and academic preparation (Pathway) programs). OIS is responsible for all international student and scholar immigration related advising, orientation, cultural, financial, scholarships, travel, employment, personal or academic related matters. OIS manages select merit and need based financial scholarships for international students including the International Cultural Service Program (ICSP).

OIS also maintains the regulatory compliance and integrity of OSU’s international student and international employee visa programs. Through trainings, workshops and consultation, the unit serves as a liaison and resource to OSU colleges and departments, as well as community groups to enhance understanding of student and scholar immigration regulations and cross cultural competency.

General inquiries can also be directed to:

• Student Services - ois.student@oregonstate.edu
• Scholar Services - ois.scholar@oregonstate.edu

International Studies Undergraduate Major (BA, HBA)

Also available at OSU-Cascades.

The International Degree is Oregon State University’s unique double-degree program. It allows any interested undergraduate student the opportunity to explore the international dimensions of any primary major. International Degree students complete Advanced Proficiency in a Second Language, Four additional Baccalaureate Core Courses in International Studies, an International Experience, and a Senior Thesis.

As an International Degree participant, you will earn two degrees. The first degree, the primary degree, will be your chosen major in any department on campus. The International Degree, or concurrent degree, will be in International Studies in your primary degree department.

For example, if your primary degree is a BS in Environmental Sciences, then the International Degree would be a BA in International Studies in Environmental Sciences.

For more information about this degree, contact:

Kerry Thomas, Academic Advisor, International Degree
International Degree and Education Abroad
University Plaza
1600 SW Western Blvd., Suite 130
Oregon State University
Corvallis, Oregon 97333
Phone: 541-737-5223
Website: http://international.oregonstate.edu/id (http://international.oregonstate.edu/id/)

Major Code: 910

Admission Requirements to the International Degree Program

1. A minimum 2.75 cumulative GPA after completing at least 32 credits of college-level courses and good standing within your department, college and the university. The dean of your college may give you special consideration if you fall below this minimum. See the International Degree office for more information about this process.
2. Proficiency in a foreign language equivalent to that attained by the end of a second-year language sequence at OSU. This may be met in one of the following ways:
   a. Successful completion of four or more years of consecutive study of the same foreign language at the high school level preceding admission to Oregon State University;
   b. Completion of the AP College Board test in a foreign language with a score of 4 or 5;
   c. Completion of the third term of a second-year foreign language sequence at OSU or another accredited university with a GPA of 3.0 or better. This course must constitute a minimum of 4 quarter or 3 semester credits.
   d. Completion of one term of a third-year foreign language course (i.e., any course designated 311, 312 or 313) at OSU or another accredited university with a GPA of 3.0 or better. This course must constitute a minimum of 3 quarter or 2 semester credits.
   e. An international student whose native language is not English who wishes to use English to satisfy the foreign language entrance requirement will have satisfied the requirement upon admission to OSU.
3. Meet any additional requirements established by your major department or college.

Special Notes about Admission
If you change majors after admission to the International Degree Program, you will have to reapply for admission to the International Degree Program in your new department.

If you are pursuing two degrees besides the International Degree, you only need to apply for the International Degree in one department. The choice of departments is up to you, but you should consult your advisors before determining where to apply.

General International Degree Requirements
1. You must successfully complete all departmental, college, and institutional requirements for your primary degree.
2. You must also complete a minimum of 32 credits in residence beyond the minimum 180 to 204 credits required for most primary degrees. Courses taken through an OSU-sponsored program abroad are considered in-residence credits. Depending on the level of previous foreign language study and experience abroad, you could take anywhere from a minimum of 32 additional credits to a maximum range of 70-plus additional credits to complete the degree.
3. Additional International Degree requirements may be established for your primary degree, so check with your major advisor or the International Degree contact in your department to make sure that you know what they are and that you are able to complete them. When you meet with your advisor, have a transcript in hand.
4. As is currently true for all degrees, your academic dean will verify that you have completed the International Degree requirements. The graduation audit will be done along with and in the same fashion as for your primary degree by your major department. Confirmation of the International Degree will be appropriately noted on your transcripts, and you will receive separate diplomas.

Specific International Degree Requirements
1. You must demonstrate advanced level achievement or proficiency in a foreign language in one of the approved ways. Typically, this requirement is met by completing the third term of a fourth-year language sequence at OSU. Students must take language courses for letter grades and earn a cumulative GPA of 3.0. Exceptions may be considered only by petition (see International Degree office for details). To find out about additional ways to demonstrate advanced proficiency, contact the International Degree office.
2. You must successfully complete a minimum of four courses selected from the baccalaureate core curriculum, with the approval of your departmental International Degree advisor. These courses are in addition to the university’s baccalaureate core requirements. The International Degree course requirements from the baccalaureate core are as follows:
   • One course selected from the Western Culture category (3–4 credits);
   • Two courses selected from the Cultural Diversity category (6–8 credits);
   • One course selected from the Western Culture, Cultural Diversity, or Contemporary Global issues categories (3–4 credits). Note: Not all four courses may focus on the same culture or language. For example, you cannot take all four of the additional baccalaureate core courses focusing on Spanish speaking countries/peoples.
   • To see the entire baccalaureate core list, refer to the BCC listings in the Catalog (p. 1614)
3. The third requirement of the degree is to spend a minimum of 10 weeks in a country where your International Degree language is spoken and be engaged in a study abroad program, an international internship or an international research project.
4. The final requirement for the degree is to prepare a rigorous and integrative senior thesis, which demonstrates a fundamental and comprehensive understanding of global issues and of the international dimensions of your primary degree. Requirements for the senior thesis include successful completion of INTL 407 for 1 credit, and 3 to 6 credits of 403 (Thesis) in your department.

Graduation Language Requirements
Students must demonstrate advanced level achievement or proficiency in a single foreign language in one of the following ways:
   • Completion of a fourth-year foreign language sequence (designated 411, 412, 413) at OSU with a minimum 3.00 GPA cumulative in all foreign language courses. Courses must be taken for a letter grade and may not be graded S/U.
   • Completion of a fourth-year foreign language sequence at another accredited university with a minimum 3.00 GPA, in a program in which the combined third-year and fourth-year language courses constitute a minimum of 18 quarter or 12 semester credits.
   • Completion of a minimum of 9 quarter (6 semester) credits with a minimum 3.00 GPA, at Oregon State University or another accredited university, of any 400-level course work (in any discipline) taught in a foreign language, if approved by the student’s primary degree department or school.
   • Demonstration of end of fourth-year level proficiency in a foreign language by successful completion of an achievement test administered by the School of Language, Culture, and Society at OSU.
Demonstration of fourth-year level proficiency in a foreign language as evidenced by an oral proficiency test administered by a certified foreign language proficiency tester that is approved by the OSU School of Language, Culture, and Society.

For languages not offered at OSU, the requirement may also be completed by a minimum of nine-month residency (study, research, work), after fulfilling the foreign language entrance requirement, in a country in which the language is spoken.

Completion of a minimum of one term international internship using the target language after completion of a third-year language sequence (311, 312, 313) at OSU with a cumulative GPA of 3.0 or above.

Experience Abroad
Students must spend a minimum of 10 weeks in another country where the language used to meet the International Degree requirement is spoken and be engaged in one of the following:

- A study abroad program offered by OSU, another university, or a program designed by the student. Programs administered by other universities or those designed by students must be approved by the International Degree Program and the student’s primary department. Currently OSU has university-sponsored programs in over 70 countries.
- An international internship or work program that receives academic credit, such as the IE3 Global Internship Program offered by OSU.
- A pre-approved research project abroad.
- Previous international experience, such as the Peace Corps, approved by the primary academic department and the International Degree Program.

Senior Thesis
The final requirement for the degree is to prepare a rigorous and integrative senior thesis that demonstrates a fundamental and comprehensive understanding of global issues and of the international dimensions of your primary degree. This thesis places your academic discipline in an international context, often in a comparative fashion. Because it fulfills the writing intensive course requirement for the International Degree, it will involve multiple drafts and revisions. The final product will represent polished, formal writing, in a format appropriate to your academic field.

Dual Thesis Requirements
You may write one thesis to meet the International Degree requirement and the thesis requirement in your department. If you will complete a senior thesis to meet another academic requirement in your primary degree, it is important to consult with academic advisors in your major as well as in the International Degree office.

Example: If you are in the University Honors College, you will work with both the Honors College and the International Degree office to ensure that you fulfill both sets of requirements.

Thesis proposal: A copy of the thesis proposal form will be on file in the International Degree Program office. The topic will evolve as you work, and may change substantially, but identifying an appropriate advisor and developing a proposal form are crucial steps in your progress toward completion of the thesis requirement of the International Degree. If your thesis ideas change significantly, it is important to file a revised proposal with the International Degree Program office.

Thesis credit: Before graduating, you will spend two to three terms working on the thesis and will receive credits through your major department. You will register for a minimum of 3 thesis credits under the department prefix appropriate to your major (403), with your thesis advisor as the professor of record. These credits may be distributed over multiple terms, and you may receive an incomplete for the credits taken during the earlier term(s) until you have finished your thesis work. You will register for these credits during the year you plan to complete your thesis work, as incomplete grades should be removed within 12 months. Please note that credits for which you receive an incomplete do not count toward credits satisfactorily completed during that term. If you receive financial aid, you should plan ahead to ensure that this does not affect your aid eligibility.

Example: If you are a sociology major, you would register for a minimum of 3 credits of SOC 403. If you are a mathematics major, you would register for MTH 403. Some departments already have a thesis course listed in the schedule of classes, but other departments may ask the registration schedule desk to set up a CRN for that course number during the term(s) for which you wish to register for thesis credit.

These credits may be graded or pass/no pass. If you and your advisor agree that the scope of your thesis warrants additional credit, and your college and department’s policies allow it, you may register for additional credits. The suggested maximum is 6 credits.

Colleges, departments, or advisors may elect to set different requirements for thesis credits that meet the needs of their programs. In this case, the requirements or preferences of the college/department take precedence over general International Degree requirements.

Requirements for the Senior Thesis
Thesis class: As a part of your program, you will enroll in the 1-credit class INTL 407, offered on a pass/no pass grading basis. The course is offered twice a year during fall and winter terms. It is designed to help you define and focus your areas of interest, get an overview of research methods, develop your thesis ideas, identify a suitable advisor in your major department who will assist you throughout the process, complete a thesis proposal form, and develop a realistic and effective timetable for completion. During this course, you will receive a copy of the guide, Preparing a Senior Thesis. Note: If you are also a student in the University Honors College, you may enroll in either the UHC thesis class or the International Degree Program’s thesis class.

Final thesis: This represents polished, formal writing. Theses average 30 to 50 pages, but to ensure fulfillment of the WIC requirement, even a thesis with a nonverbal component such as art, music, or photography must include a minimum of 8 to 10 pages of formal writing and place the thesis in the appropriate historical/cultural context by incorporating and documenting outside sources.

Example: A graphic arts student who interned in Russia compared contemporary posters in the U.S. and Russia, and displayed examples. He also wrote an analysis of his findings.

Presentation: When your thesis is complete, you will make a public presentation of your work. The format may vary depending on your topic and your own preferences, but you will present your thesis to a group including your advisor, other interested faculty in your department,
representatives of the International Degree program, and other guests whom you may want to invite.

Final copies of the log and thesis must be turned in to your major department and the International Degree office two weeks prior to the date that grades are due for graduating seniors for the term you plan to graduate. This is usually a week before finals week.

**Additional College and Departmental Requirements**

**Foreign Language Majors**

To earn the International Degree you must complete the second foreign language required of a language major through the fourth-year level. You must also spend two 10-week periods abroad, one in each of the countries where the two languages you are studying are spoken. For example, if you are a German major and have decided to take Russian as your second foreign language, you must complete the 400-level Russian course and study abroad in both Germany and Russia.

Additionally, you may not complete major/minor requirements without taking upper-division courses in the OSU School of Language, Culture, and Society even if you complete the hour requirements abroad.

**College of Forestry Majors**

As part of the four additional baccalaureate core courses required for the International Degree, you must take FE 456 /FOR 456.

**Scholarships**

In support of the overseas learning experience, the International Degree Program has funds available to assist students traveling abroad and to assist with costs associated with research for your thesis. These are awarded on a competitive basis. Please talk to the International Degree office for more information.

**Major Code: 910**

**Reserve Officer Training Corps**

For more than a century, military training has been offered at Oregon State University. Fulfilling a provision of the Morrill Act of 1862, which gave Corvallis College its first public support, an Army Cadet Corps was organized in 1873.

ROTC at Oregon State is made up of the departments of Military Science, Naval Science, and Aerospace Studies. In 1917, the Department of Military Science became responsible for all military training under the National Defense Act of 1916. This act expanded and standardized the training of Army officers by colleges and universities and established the Reserve Officer Training Corps (ROTC). During World War II, OSU became known as the "West Point of the West" for commissioning more officers than any other nonmilitary academy in the nation. At the end of World War II, the secretary of the Navy commissioned the Department of Naval Science (NROTC) on this campus to provide the training of both Navy and Marine Corps officers. On July 1, 1949, the U.S. Air Force activated an AFROTC unit that today is called the Department of Aerospace Studies. OSU is now one of 48 colleges and universities that offer education for all three military departments.

Originally, two years of military science and tactics were required of all able-bodied male students, but since 1962, ROTC has been voluntary. Since 1965, two-year programs have been available for students who have finished two years of college but have not taken ROTC previously.

As opportunities for women to serve as officers in the armed forces grow, opportunities for women to participate in ROTC programs expand. Women have long been eligible to take ROTC course work for credit. Since 1970, they have been enrolled as cadets in Air Force ROTC and, since 1973, have also been enrolled as cadets and midshipmen in the Army and Navy ROTC programs.

**Mission and Objectives**

The ROTC selects and prepares young men and women, through a program of instruction coordinated with the student's normal academic curriculum, for commissioning and service as officers in the regular and reserve components of the Army, Navy, Air Force, and Marine Corps.

**Uniforms and Allowances**

Students in each of the units receive uniforms to be worn at drill periods and on special occasions. Travel to and from any summer camps or cruises is paid. While at camp or on a cruise, the members receive food and quarters at government expense in addition to basic pay. (See the individual sections for further information on the various camps and cruises.) Those selected for the scholarship programs receive tuition, books, and fees plus $300 to $500 a month subsistence pay for up to 40 months.

**Flight Training**

Eligible Army, Navy, Marine Corps, and Air Force ROTC students may be selected for flight training upon their successful completion of the program and commissioning.

**How to Enroll**

See the Army (https://catalog.oregonstate.edu/college-departments/rotc/military-science/), Navy (https://catalog.oregonstate.edu/college-departments/rotc/naval-science/), or Air Force (https://catalog.oregonstate.edu/college-departments/rotc/aerospace-studies/) sections of this catalog for enrollment details for the various ROTC programs. All three departments have staff available throughout the year during normal school hours to answer any inquiries regarding the ROTC programs.

**Aerospace Studies**

The Air Force Reserve Officers Training Corps (AFROTC) program, offered by the Department of Aerospace Studies, provides college-level education to prepare interested men and women for commissioning as second lieutenants in the United States Air Force while simultaneously completing any university undergraduate or graduate degree. The program emphasizes leadership, managerial skills, and the development of each student’s sense of personal integrity, honor, and individual responsibility.

Aerospace Studies courses are open to all university students and are taught by Air Force officers. Detachment 685 (Aerospace Studies) offers a Minor in Aerospace Leadership for graduating students/cadets. If students desire a career as an Air Force officer, they must complete all AFROTC requirements. University students who attend academic classes only as a special student (there is no stipend for special students) can receive elective credit for the course(s). Except for cadets on AFROTC scholarship, students incur no active-duty service commitment by taking
general military courses (GMC) and may drop the courses at any time within the limits of university course-drop policies.

The U.S. Air Force’s mission is to ‘Fly, Fight and Win in Air, Space and Cyberspace.’ Whether a student’s interest lies in flying advanced aircraft, operating sophisticated outer space systems, defending America’s cyberspace infrastructure, researching and developing state-of-the-art technology, or working as a language interpreter, defense intelligence officer, medical or legal professional, the Aerospace Studies Department can guide students to exciting and challenging opportunities.

**AFROTC Scholarships**

If students qualify, scholarship opportunities are available. A variety of full and partial scholarships are available, and certain scholarships have specific requirements. Test high school students must apply online no later than December-January timeframe, before they begin college in order to compete for a scholarship while still in high school. Students will find application procedures, forms and deadlines online (http://www.afrotc.com/).

Air Force ROTC scholarships cover up to 100% of tuition, laboratory fees, and incidental expenses. ROTC scholarship students will also receive $900 annually for textbooks and a monthly tax-free stipend of up to $500. Students must apply and be accepted into the AFROTC program and agree to accept an Air Force officer commission and service commitment upon graduation.

For details on AFROTC or on Air Force scholarships, contact the AFROTC Detachment, McAlexander Fieldhouse, Room 303, (541) 737-3291, (800) 633-7352 or email: afrotc@oregonstate.edu. Website: http://flyingbeavs.com/ or http://www.afrotc.com/.

**Allowances, Uniforms, Textbooks**

Students on an Air Force ROTC scholarship or enrolled in the ROTC Professional Officer Course are paid a monthly stipend of up to $500. Uniforms and textbooks for all Aerospace Studies courses are provided by the Air Force.

**Four- or Three-Year Program**

The four- or three-year program consists of the General Military Course: six quarters of lower-division Air Force Studies classes, including a laboratory each term, and the Professional Officer Course: six quarters of upper-division Air Force Studies classes, including a laboratory each term. Four- or three-year cadets attend an expeditionary summer field training (AS 304) prior to their junior year of college.

If you’re already in college, it’s not too late to experience the benefits of joining Air Force ROTC. There are numerous options for you even if you start after your freshman year. Previous military experience—ROTC, Academy, or military service—may allow the Professor of Aerospace Studies to waive all or part of the General Military Course (freshman and sophomore years) for students enrolled in the four-year AFROTC program. This program provides an opportunity for students who did not enter ROTC previously. Entry is on a competitive basis and the accelerated three-year program is available to students who join no later than Fall term with no fewer than 3 years remaining in school.

Students may enter the first-year class during the fall, winter, or spring term. Sophomore students may take the 100 and 200 level courses concurrently. Prior to enrolling in the last two years of the program, the Professional Officer Course, the student must meet AFROTC qualification standards and requirements.

**Special Program**

Special programs are also open for Law Students and graduate Law Programs. Students already attending law school wishing to serve as Air Force Judge Advocate Generals (JAGs) may apply for the program through the Air Force JAG website. Officer training will be provided by the AFROTC detachment at an accelerated pace to meet Air Force recruiting goals.

**General Military Course (GMC)**

The 100- and 200-level courses for AFROTC cadets consist of one classroom hour, two hours of leadership laboratory, and two hours of physical fitness per week during the freshman and sophomore years. Uniforms and textbooks are provided. Students may enter the freshman class at the start of autumn or winter quarters. Sophomore students may enter at the start of Fall, Winter or Spring terms. A field training-course, normally taken during the summer between the sophomore and junior years, is required for entry into the professional officer courses. Students will receive pay and travel costs for field training.

**Professional Officer Course (POC)**

Cadets selected for enrollment in professional officer courses are enlisted in the Air Force Reserve and receive tax-free monthly subsistence stipends ranging from $300 - $500 a month. They are furnished text books and uniforms. Junior- and senior-level classes consist of three hours of academic classes, two hours of leadership laboratory and two hours of physical fitness per week.

**Commitments**

Students in the four-year program incur no obligation during their first two years in AFROTC unless on scholarship. The student agrees to accept a commission, if offered, only after enrolling in AS 311. High school scholarship students incur a commitment at the beginning of their sophomore year. Upon accepting their commissions, students incur a 4 year commitment; pilots incur a 10 year obligation after completion of pilot training; combat systems officers and air battle managers incur a 6 year obligation after initial training. Graduates pursuing medical school incur a 4 year commitment after medical school.

**Standards**

Cadets must be U.S. citizens of sound physical condition, maintain academic standards and high moral character. Air Force physical fitness standards must be met prior to activating a scholarship, attending field training and commissioning.

Cadets must be commissioned as Air Force officers prior to age 39, unless commissioned as rated officers who must be commissioned prior to age 29.

**Further Educational Opportunities**

After completion of AFROTC requirements, advanced degrees may be sought by delaying active duty commitments. Some commissioned officers continue advanced studies through fully-funded Air Force Institute of Technology or other DoD-sponsored programs.
Field Training
Under the Air Force ROTC program, one summer field training session is required, normally after the AS 200 year. Successful completion of field training is required for all cadets prior to membership in the Professional Officer Course. Students are paid varying amounts during field training.

Undergraduate Programs

Minor
- Aerospace Studies (p. 1090)

Lieutenant Colonel Michael W. Rue, Commander
308 McAlexander Fieldhouse
Oregon State University
Corvallis, OR 97331-4903
Phone: 541-737-3291
Email: afrotc@oregonstate.edu
Website: http://flyingbeavs.com

Faculty
Professor Lt Col Michael W. Rue, U.S. Air Force
Assistant Professors Maj Michael Vanderlaan, Capt Renee Bohac

Aerospace Studies

AS 111. FOUNDATIONS OF THE AIR FORCE PART I. (1 Credit)
The introduction to the Air Force mission and organization. Featured topics include Air Force dress and appearance stand standards; military customs and courtesies, Air Force heritage, overview of the Department of the Air Force, and Air Force core values. Basic oral and written communication will be assessed.

AS 112. FOUNDATIONS OF THE AIR FORCE PART II. (1 Credit)
Second part of the introduction to the Air Force mission and organization. Featured topics include Air Force career opportunities, Air Force benefits, military communication skills, Air Force installations, and look at the basic characteristics of war. Basic oral and written communication will be assessed.

AS 113. FOUNDATIONS OF THE AIR FORCE PART III. (1 Credit)
Third part of the introduction of what the Air Force is about and what the Air Force has to offer. Featured topics include basic leadership, team building, interpersonal skills, diversity in the Air Force, and the oath of office and commissioning. Basic oral and written communication will be assessed.

AS 120. LEADERSHIP LABORATORY. (1 Credit)
Cadets learn officership, leadership, drill and ceremony, and customs and courtesies. Lab. Graded P/N. 
This course is repeatable for 3 credits.

AS 211. THE EVOLUTION OF AIR AND SPACE POWER 1860-1945. (1 Credit)
Study of the development of air power, concepts, and doctrine from its beginnings to the end of World War II. Historical examples examined include balloons, dirigibles, Wright Brother’s first flight, and the role of air power in World War I and II. Oral and written communication skills will be assessed.

AS 212. THE EVOLUTION OF AIR AND SPACE POWER 1945-1990. (1 Credit)
Study of the development of air power, concepts, and doctrine during the Cold War. Historical examples examined include the Berlin Airlift, nuclear deterrence, and the role of air power employment in the Korean and Vietnam conflicts. Oral and written communication skills will be assessed.

AS 213. THE EVOLUTION OF AIR AND SPACE POWER 1991-2025. (1 Credit)
Study of the factors contributing to the development of air power, concepts, and doctrine from the Persian Gulf War in 1990 to the present and beyond. Historical examples examined include the air campaigns used in the Gulf War, Kosovo crisis, Operations Enduring Freedom, Iraqi Freedom, and the Global War on Terrorism. Oral and written communication skills will be assessed.

AS 220. LEADERSHIP LABORATORY. (1 Credit)
Cadets are placed in element leadership positions in order to know and comprehend the Air Force concepts of command, discipline, tradition, and courtesies. Lab. Graded P/N. 
This course is repeatable for 10 credits.

AS 299. SPECIAL TOPICS IN AIR FORCE STUDIES. (1-16 Credits)
Supervised individual work. 
This course is repeatable for 99 credits.

AS 304. FIELD TRAINING. (6 Credits)
Four-week field training supplements campus courses in developing leadership and discipline. Mission, organization, and functions of an Air Force base; marksmanship, survival, and physical training; aircrew and aircraft indoctrination; orientation on specific opportunities in career fields. Conducted at an Air Force base. Graded P/N.

AS 311. LEADERSHIP FUNDAMENTALS, TEAM BUILDING AND PROBLEM SOLVING. (3 Credits)
Emphasis on leadership and management fundamentals, team building and problem solving. Case studies are used to examine leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. Unique exercises will be utilized to emphasize team building and problem solving. Oral and written communication skills will be assessed.

AS 312. EFFECTIVE SUPERVISION AND GROUP CONFLICT MANAGEMENT. (3 Credits)
Emphasis on situational leadership, group conflict management, effective supervision, professional knowledge, and communicative skills required of an Air Force officer. Unique case studies on leadership and management situations, and group conflict management will be utilized. Oral and written communication skills will be assessed.

AS 313. LEADERSHIP, ETHICS, AIR FORCE CORE VALUES AND ACCOUNTABILITY. (3 Credits)
Emphasis on leadership ethics, leadership core values, leadership accountability, and professional knowledge. Unique case studies on leadership ethics and accountability will be utilized. Oral and written communication skills will be assessed.

AS 320. LEADERSHIP LABORATORY. (1 Credit)
Cadets are placed in line and staff leadership positions as a preparation for Air Force active duty. Cadet responsibilities include planning, organizing, directing, and controlling the activities of the cadet corps. Lab. Graded P/N. 
This course is repeatable for 3 credits.
### Aerospace Studies Minor

The Department of Air Force Studies offers a minor open to any OSU student. Students gain a broad exposure to the concepts of aerospace power, leadership and management, and general military studies. A student cannot use a course for this minor that is being used for their major.

**Minor Code: 804**

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
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<td>AS 312</td>
<td>EFFECTIVE SUPERVISION AND GROUP CONFLICT MANAGEMENT</td>
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<td>AS 313</td>
<td>LEADERSHIP ETHICS, AIR FORCE CORE VALUES AND ACCOUNTABILITY</td>
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<tr>
<td>AS 411</td>
<td>NATIONAL SECURITY AFFAIRS</td>
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<td>AS 412</td>
<td>WORLD REGIONAL CULTURAL STUDIES</td>
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<tr>
<td>AS 413</td>
<td>PREPARATION FOR ACTIVE DUTY</td>
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**Electives**

Select a minimum of 9 credits of the following:

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<tr>
<td>AS 211</td>
<td>THE EVOLUTION OF AIR AND SPACE POWER 1860-1945</td>
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<td>AS 212</td>
<td>THE EVOLUTION OF AIR AND SPACE POWER 1945-1990</td>
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<td>AS 213</td>
<td>THE EVOLUTION OF AIR AND SPACE POWER 1991-2025</td>
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<tr>
<td>AS 320</td>
<td>LEADERSHIP LABORATORY (maximum of 3 credits)</td>
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<tr>
<td>AS 420</td>
<td>LEADERSHIP LABORATORY (maximum of 3 credits)</td>
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<tr>
<td>COMM 322</td>
<td>SMALL-GROUP PROBLEM SOLVING</td>
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<tr>
<td>COMM 440</td>
<td>THEORIES OF CONFLICT AND CONFLICT MANAGEMENT</td>
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<tr>
<td>COMM 446</td>
<td>*COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES</td>
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<tr>
<td>HST 316</td>
<td>THE AMERICAN MILITARY, 1607-1865</td>
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</table>

* Baccalaureate Core Course (BCC)

### Military Science (AROTC)

The Military Science program is intended for students with the characteristics and attributes of a “scholar-athlete-leader.” The program is specifically designed to give college students on-campus instruction and experience in the art of organizing, motivating, and leading others. It includes instruction in leadership to develop self-discipline, physical stamina, and professional bearing.

All courses offered by the Department of Military Science are fully accredited and applicable toward fulfilling academic requirements for graduation. The university offers each eligible student the opportunity to compete for a commission as an officer in the United States Army while earning a college degree. There are both basic and advanced programs with multiple entry points which can be tailored to a student’s needs. Merit scholarship opportunities exist for students in any approved academic discipline, particularly in computer science, engineering, math, and science. Uniforms and books are provided free of charge. There are multiple opportunities for cadets to attend funded internships, training with Army units, multi-week trips to foreign countries across the world, Airborne, and Air Assault Training.

#### Basic Program

The basic program is voluntary and is open to all students, comprising the 1- and 2-credit, lower-division courses listed below, and is normally completed during the freshman and sophomore years. Students may also satisfy the advanced program prerequisites or accelerate their progress by completing the 3-credit, upper-division courses listed below, must apply and be accepted. Only those students who have satisfied the basic program requirements described above are eligible. Enrollment in the
Advanced Program requires a contract incurring a Service Commitment in the Army, Army Reserve, or Army National Guard.

Students in the advanced program receive $450 to $500 per month subsistence allowance during the school year. During the four-week summer Leadership Development Assessment Course (LDAC), they receive room and board, travel expenses to and from the program location, and approximately $900 for the period involved. Veteran students enrolled in the ROTC program receive these amounts in addition to any other educational benefits.

The LDAC summer program is normally attended between the cadet’s junior and senior years. The university awards 6 credits for successful completion.

Campus-Based Scholarship Program

Each year, the Army ROTC program has dedicated four-, three-, and two-year scholarships awarded to local students attending or planning to attend OSU. Applications are accepted any time during the year. Applicants must meet physical requirements, have a minimum cumulative college GPA of 2.50, SAT score of 920+ or ACT of 19+, no criminal record, and be of good moral character. The scholarship pays full tuition, $1,200 per year for books, and a stipend of $300 to $500 per month while the student is in school. For an application, contact the Department of Military Science at 541-737-3511.

Simultaneous Membership Program (SMP)

The Simultaneous Membership Program (SMP) is a voluntary program that allows ROTC students to join the Army National Guard and Army Reserve. Upon graduation from basic training and advanced training, students are eligible for the G.I. Bill, which, combined with tuition assistance, is worth over $18,000 per year as a full-time student. Upon degree completion, students earn a commission in the active Army, National Guard or Army Reserve.

Service Obligation and Academic Delay

Current laws and regulations require each advanced program graduate to accept a commission upon graduation and to fulfill an eight-year military commitment. This may be satisfied by eight years of reserve forces duty in the USAR or ARNG or by a combination of active duty and reserve forces duty, usually four years active duty and four years reserve forces duty.

Delays in reporting to active duty may also be granted for up to four years to selected students who are enrolled in a full-time program of instruction leading to an acceptable advanced degree.

Undergraduate Programs

Minor

• Military Science (p. 1092)

LTC David O. McRae, Commanding Officer
200 McAlexander Fieldhouse
Oregon State University
Corvallis, OR 97331-4901
Phone: 541-737-3511
Email: army.rotc@oregonstate.edu
Website: http://oregonstate.edu/dept/arotc/

Faculty

Professor LTC David McRae
Assistant Professors Major Joseph Snyder, Master Sergeant Adam Nin, Sergeant First Class Justin Spangler, Sergeant First Class Dustin Farnsworth, Mr. John Mayer

Military Science

MS 111. MILITARY SCIENCE I: INTRODUCTION TO ARMY LEADERSHIP AND ROTC. (1 Credit)
Introduction to ROTC, and its relationship to the U.S. Army. Role of the army officer, including leadership and management fundamentals. Introduction to land navigation. Lec/lab.

MS 112. MILITARY SCIENCE I: INTRODUCTION TO BASIC MILITARY SKILLS. (1 Credit)
Basic small unit tactics; land navigation; how to read a topographic map and use a magnetic compass; includes practical exercises. Graded A-F only.

MS 113. MILITARY SCIENCE I: INTRODUCTION TO TACTICAL LEADERSHIP. (1 Credit)
Customs and traditions of the U.S. Army; unit organization and missions. Types of careers available to army officers. Practical exercises. Lec/lab.

MS 130. *MILITARY PHYSICAL CONDITIONING. (1 Credit)
Prepares military science cadets and university students to excel in the Army Physical Fitness Test (APFT). (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness
This course is repeatable for 11 credits.

MS 211. MILITARY SCIENCE II: FOUNDATIONS OF LEADERSHIP I. (2 Credits)
An examination of effective leadership. Development of interpersonal skills using practical exercises and case studies. Graded A-F only. Lec/lab.

MS 212. MILITARY SCIENCE II: FUNDAMENTALS OF LEADERSHIP II. (2 Credits)
History of the American soldier from 1775 to 1919; weaponry and tactics of the American Army. Use of battle analysis and war gaming included.

MS 213. MILITARY SCIENCE II: FUNDAMENTALS OF MILITARY OPERATIONS. (2 Credits)
Basic U.S. Army tactics at the individual, team, and squad levels. Integration of military skills in offensive and defensive operations. Graded A-F only. Lec/lab.

MS 214. MILITARY SCIENCE: LEADER'S TRAINING COURSE (LTC). (6 Credits)
Four weeks of classroom and field training at Fort Knox, Kentucky. Can substitute for the first two years of the ROTC program.

MS 311. MILITARY SCIENCE III: LEADERSHIP AND MANAGEMENT OF MILITARY ORGANIZATION. (3 Credits)
Study of military leadership, management, theory and dynamics of the military team. Applies principles to advanced military operations. Includes leadership, management, and organizational theory; group dynamics; functions of staff organizations; development of the commander’s estimate; combat orders and plans; troop leading procedures; application of leadership concepts in offensive and defensive operations at the squad, platoon, and company level; and fundamentals of small-unit tactics/patrolling. Graded A-F only. Lec/lab.
**Military Science Minor**

Also available at OSU-Cascades.

The Department of Military Science offers a minor which is open to any OSU student.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>MS 311</td>
<td>MILITARY SCIENCE I: INTRODUCTION TO ARMY LEADERSHIP AND ROTC</td>
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<tr>
<td>MS 312</td>
<td>MILITARY SCIENCE I: INTRODUCTION TO BASIC MILITARY SKILLS</td>
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<td>MS 313</td>
<td>MILITARY SCIENCE I: INTRODUCTION TO TACTICAL LEADERSHIP</td>
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<td>MS 211</td>
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<td>MS 212</td>
<td>MILITARY SCIENCE II: FUNDAMENTALS OF LEADERSHIP II</td>
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<td>MS 213</td>
<td>MILITARY SCIENCE II: FUNDAMENTALS OF MILITARY OPERATIONS</td>
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<tr>
<td>MS 311</td>
<td>MILITARY SCIENCE III: LEADERSHIP AND MANAGEMENT OF MILITARY ORGANIZATIONS</td>
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</tr>
<tr>
<td>MS 312</td>
<td>MILITARY SCIENCE III: LEADERSHIP AND MANAGEMENT OF MILITARY ORGANIZATIONS</td>
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</tr>
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<td>MS 313</td>
<td>MILITARY SCIENCE III: LEADERSHIP AND MANAGEMENT OF MILITARY ORGANIZATIONS</td>
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<tr>
<td>MS 314</td>
<td>MILITARY SCIENCE IV: LEADER DEVELOPMENT AND ASSESSMENT COURSE</td>
<td>3</td>
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<tr>
<td>MS 315</td>
<td>MILITARY SCIENCE IV: PREPARATION FOR OFFICERSHIP I</td>
<td>3</td>
</tr>
<tr>
<td>MS 316</td>
<td>MILITARY SCIENCE IV: PREPARATION FOR OFFICERSHIP II</td>
<td>3</td>
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</table>

At least 18 of the 27 credits required in the minor must be military science courses.

**Electives**

Select 9 credits of the following:

1. **Anthropology**
   - ANTH 380 *CULTURES IN CONFLICT
2. **Communication**
   - COMM 114 *ARGUMENT AND CRITICAL DISCOURSE
   - COMM 218 *INTERPERSONAL COMMUNICATION
   - COMM 322 SMALL-GROUP PROBLEM SOLVING
   - COMM 446 *COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES
3. **History**
   - HST 317 *WHY WAR: A HISTORICAL PERSPECTIVE
   - HST 318 THE AMERICAN MILITARY, 1865-PRESENT
   - HST 465 *AMERICAN DIPLOMATIC HISTORY
   - MS 405 READING AND CONFERENCE
4. **Peace Studies**
   - PAX 201 STUDY OF PEACE AND THE CAUSES OF CONFLICT
5. **Philosophy**
   - PHL 205 *ETHICS
   - PHL 344 *PACIFISM, JUST WAR, AND TERRORISM
   - PHL 451 KNOWLEDGE AND REALITY
6. **Political Science**
   - PS 201 *INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS
   - PS 205 *INTRODUCTION TO INTERNATIONAL RELATIONS

Total Hours 27

* Baccalaureate Core Course (BCC)

A minimum of one course must be taken from the History list (minimum 3 credits) and two 3-credit courses are required (for a total of 6 credits) from the remaining categories. A student cannot use a course for this minor that is also part of their major.

Minor Code: 805
Naval Science (NROTC)

The NROTC program was established to educate and train qualified young men and women for service as commissioned officers in the unrestricted line Naval or Marine Corps Service. As the largest single source of Navy and Marine Corps officers, the NROTC program fills a vital need in preparing mature young men and women for leadership and management positions in an increasingly technical Navy and Marine Corps. NROTC midshipmen compete for selection into various warfare areas: pilot, naval flight officer, submarine officer, surface warfare officer, and special warfare officer. Upon successful completion of the program and graduation from Oregon State University, NROTC midshipmen receive a commission from the president of the United States as an ensign in the U.S. Navy or second lieutenant in the U.S. Marine Corps. The minimum active service requirement upon commissioning is service dependent; it is five years for Navy and four years for the Marines.

NROTC Scholarships

The Navy offers four-year scholarships to qualified students seeking baccalaureate degrees. Students are selected through national competition, and are appointed midshipmen in the United States Naval Reserve by the secretary of the Navy. The Navy provides uniforms and pays tuition, a $250 per term book stipend, and subsistence allowance of $250 to $400 per month depending on the student’s undergraduate status. Scholarship students will be required to attend summer training after their freshman, sophomore, and junior years designed to familiarize them with the warfare areas of the Navy and Marine Corps.

To qualify for a national NROTC scholarship you must be a U.S. citizen not less than 17 years old by September 1 of your first year of college and no more than 23 years old that same year. Additionally you must be physically qualified by Naval or Marine Corps standards, and meet aptitude and physical fitness standards, and receive a favorable recommendation from the professor of naval science. If selected, students receive the same benefits as national scholarship recipients.

For more information about Naval ROTC scholarship opportunities, visit the website (http://www.nrotc.navy.mil/) or contact your local Navy-Marine Corps recruiting office. For specific information about OSU NROTC or questions regarding the two-year NROTC scholarships, visit the website (http://nrotc.oregonstate.edu/) or call the unit at 541-737-5620 or 541-737-6289.

College Program

Students who are not awarded a national scholarship and are accepted to OSU can still participate in Naval ROTC through the college program by applying through the OSU Department of Naval Science. College program midshipmen participate in all aspects of the NROTC program and may be eligible for a scholarship provided they have been active in the program for a minimum of one academic term. To be competitive, a student should not have less than a B (3.0) grade-point average, meet aptitude and physical fitness standards, and receive a favorable recommendation from the professor of naval science. If selected, students receive the same benefits as national scholarship recipients.

College program midshipmen who are not awarded a scholarship must be selected for “advanced standing” status before beginning their junior year to remain in the NROTC program. If selected for “advanced standing” students receive a monthly subsistence allowance of $350 their junior year and $400 their senior year. College program midshipmen receive a commission upon graduation and have the same professional opportunities as scholarship midshipmen to select careers in all warfare areas of the Navy and Marine Corps. For specific information about the college program, visit the website (http://nrotc.oregonstate.edu/) or call the unit at 541-737-5620 or 541-737-6289.

Naval Science Minor Requirements

Any university student may take naval science courses for credit. However, such students are classified as naval science students and are not enrolled in the NROTC program.

Status and Curriculum

Students enrolled in the NROTC program are not on active duty. They wear the uniform only for drills, on special occasions, and during the summer training periods.

The program of study fits into curricula leading to baccalaureate degrees. Additionally, Naval Science-U.S. Navy minor scholarship students must complete three terms of calculus by the end of their sophomore year and three terms of calculus-based physics by the end of their junior year.

Undergraduate Programs

Minors

• Naval Science-U.S. Marine Corps (p. 1094)
• Naval Science-U.S. Navy (p. 1094)

Captain Trey Sisson, USN (US Navy)
Commanding Officer
104 Naval Science
Oregon State University
Corvallis, OR 97331-5401
Phone: 541-737-6289
Website: http://nrotc.oregonstate.edu/

Faculty

Professors Captain Trey Sisson (USN, Commanding Officer), Commander Valdespino (USN, Executive Officer)
Assistant Professors Captain Davis (USMC), Lieutenant Frantz (USN), Lieutenant Hill (USN), Lieutenant Rumments (USN)
Instructor Gunnery Sergeant Williams (USMC)

Naval Science

NS 002. LEADERSHIP. (0 Credits)
Provides students with basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience help students explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

NS 111. INTRO TO NAVAL SCIENCE. (3 Credits)
Naval organization and administration; organization of the Navy or Marine Corps, the Navy and Marine Corps as a career, responsibilities and commitments as an officer in the Navy or Marine Corps.

NS 112. U.S. NAVAL HISTORY I. (3 Credits)
A study of U.S. seapower and maritime affairs from the American Revolution through 1900. Lec/lab.
NS 113. U.S. NAVAL HISTORY II. (3 Credits)
A study of U.S. seapower and maritime affairs from 1900 through present day. Lec/lab.
Prerequisites: NS 112 with D- or better

NS 211. LEADERSHIP AND MANAGEMENT. (5 Credits)
Overview of the principles, philosophies, and methodologies of effective Naval leadership with emphasis on moral, ethical actions with respect to the principles of authority, responsibility, and accountability as they apply to military organizations.
Prerequisites: NS 111 with D- or better

NS 212. NAVAL ENGINEERING. (5 Credits)
Propulsion, basic engineering systems theory, and concepts application in modern ship and jet propulsion. Course will include auxiliary systems, theory and design of shipboard auxiliaries, ship design, and damage control/safety procedures. Offered every other winter term.
Prerequisites: NS 111 with D- or better

NS 311. NAVIGATION. (5 Credits)
Introduction to navigation including piloting, dead reckoning, and voyage planning. Course includes nautical rules of the road, maneuvering board, relative motion, and shipboard external communications.

NS 312. NAVAL ENGINEERING. (5 Credits)
Provides a basic understanding of the art and practice of warfare from the beginning of recorded history to present day. Utilizes Marine Corps Doctrinal Publications as base documents to evaluate warfare technology, tactics, and strategic thought. Special emphasis is placed on the evolution and innovation of warfare, and decision-making at all levels of war. Historical case studies recognize and reinforce patterns, enduring themes, and principles of warfighting. Historical study is not simply to ascertain what happened, but to use historical lessons learned as a basis for making practical judgments about the present and future.
Prerequisites: NS 322 with D- or better

NS 321. EVOLUTION OF WARFARE. (5 Credits)
Introduction to navigation including piloting, dead reckoning, and voyage planning. Course includes nautical rules of the road, maneuvering board, relative motion, and shipboard external communications.
Prerequisites: NS 311 with D- or better

NS 322. LEADERSHIP AND ETHICS. (4 Credits)
The second of two core leadership courses that provide the academic foundation of NROTC leadership development. The purpose of this capstone course is to provide future naval leaders with a sound moral leadership foundation for “real life” military decision making. Integrates an intellectual exploration of Western moral traditions and ethical philosophy with military leadership, core values, professional ethics, the Uniform Code of Military Justice, and Navy regulations. Combining ethical theory and leadership discussions with current military events will prepare students for the role and responsibilities of leadership in the naval service.
Prerequisites: NS 211 with C- or better

NS 413. LEADERSHIP AND ETHICS. (4 Credits)
The second of two core leadership courses that provide the academic foundation of NROTC leadership development. The purpose of this capstone course is to provide future naval leaders with a sound moral leadership foundation for “real life” military decision making. Integrates an intellectual exploration of Western moral traditions and ethical philosophy with military leadership, core values, professional ethics, the Uniform Code of Military Justice, and Navy regulations. Combining ethical theory and leadership discussions with current military events will prepare students for the role and responsibilities of leadership in the naval service.
Prerequisites: NS 211 with C- or better

NS 421. FUNDAMENTALS OF MANEUVER WARFARE. (5 Credits)
A detailed look at broad aspects of warfare and their interactions with maneuver warfare doctrine, with a focus on the United States Marine Corps. Throughout the course there is a strong focus on leadership, as the fundamental purpose of this course is to develop the skills, knowledge, leadership background, and mindset necessary for a successful Marine Corps Officer. This class is open to all students; however, most topics and concepts of this class are intended to professionally develop future United States Marine Corps officers.
Prerequisites: NS 321 with D- or better

Naval Science-U.S. Marine Corps Minor
The Department of Naval Science offers two minors. Naval Science-U.S. Navy and the Naval Science-U.S. Marine Corps which are open to ROTC students and may include students not pursuing a commission through the ROTC program.

Minor Code: 811

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<td>NAVAL SCIENCE III: MARINE CORPS OPTION</td>
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<td>NS 413</td>
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<tr>
<td>NS 421</td>
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Total Hours: 31

Minor Code: 811

Naval Science-U.S. Navy Minor
The Department of Naval Science offers two minors. Naval Science-U.S. Navy and the Naval Science-U.S. Marine Corps which are open to ROTC students and may include students not pursuing a commission through the ROTC program.

Minor Code: 812

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<td>NS 212</td>
<td>NAVAL ENGINEERING</td>
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<tr>
<td>NS 311</td>
<td>NAVIGATION</td>
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Total Hours: 26
Honors College

The Honors College (HC) is a small degree-granting college at Oregon State University where enrolled students work toward an Honors Baccalaureate degree in their academic major(s). The HC engages students in unique curricular and co-curricular experiences designed to help them explore the many opportunities offered by OSU. Honors undergraduates explore their full range of interests through small, hands-on courses and dive deeply into a single discipline through an immersive original research project, guided by a faculty mentor. The honors curriculum changes each year to adapt to student interests and to take full advantage of the wide-ranging expertise of Oregon State faculty.

The Honors College, in partnership with University Housing and Dining Services, maintains an honors living-learning community in West and Sackett Residence Halls.

The Honors College is available at Corvallis and OSU-Cascades.

Majors and Degrees

Students enrolled in the Honors College can pursue any one of OSU’s wide range of undergraduate majors. Students who complete the requirements of the Honors College receive OSU’s most prestigious undergraduate degree: an honors baccalaureate degree in their major, jointly awarded by the Honors College and the college of their major.

Honors Courses

See the Schedule of Classes (https://classes.oregonstate.edu/) each term under Honors College (HC) and under departmental listings for courses with an H suffix. The HC publishes its own schedule, which is available each term in the HC office and on the HC website. Honors courses change annually; many are offered under departmental designators.

Admission

To be considered for admission, high school applicants must have a minimum of a 3.75 cumulative unweighted high school GPA (students who don't meet the GPA minimum can qualify with a test score of 1300 SAT or 27 ACT). Honors College admission is competitive, and decisions are based on grade-point averages, SAT or ACT scores, and responses to an essay question that reveal the student’s ability to think deeply and creatively.

Entering first-year students interested in beginning the HC fall term should submit an application by either November 1 or February 1. HC applicants must also apply for admission to OSU by that time. Admission decisions are made approximately 45 days after the submission deadlines. A response to the current year HC essay question is required.

Transfer or advanced-standing applicants should submit an application by March 15th and will be notified no later than April 30th.

On-campus visits are encouraged.

Degree Requirements

The honors degree is jointly awarded by the Honors College (HC) and by the colleges of the student’s major. Therefore, additional credit requirements beyond the total required by the colleges of the student’s major must be completed. HC students must satisfy all university and major requirements, as well as honors requirements. A student who completes a 30-credit track of Honors College courses will be designated an Honors Scholar. A student who completes a 15-credit track will be designated as an Honors Associate. In either instance successful completion leads to receipt of an honors baccalaureate degree. Transcripts will reflect Honors College completion, honors coursework, and a research notation for the honors thesis.

Many honors classes satisfy dual requirements; please check details with an Honors College advisor. For students in majors that require a senior thesis project, the honors thesis requirements may complement those majors.

Retention Criteria

All HC students must maintain a 3.25 cumulative OSU GPA and make satisfactory progress toward fulfilling the requirements of the HC and their major. Progress in three key areas—GPA, course work, and thesis—will be reviewed every fall, winter, and spring term. Students below, or at risk of falling below, the specified 3.25 cumulative OSU GPA will be notified to come in for advising. Students who do not meet retention expectations may be removed from the college. If removed, a student has the right to petition for reinstatement.

All students must maintain contact with Honors College advisors through regularly scheduled appointments.

Undergraduate Programs

Majors

• Honors Associate (p. 1121)
• Honors Scholar (p. 1121)
ACTG 378H. ACCOUNTING INFORMATION MANAGEMENT. (4 Credits)
Introduces students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, the system life cycle model, systems analysis and design methodologies, and the development and implementation of information systems. Lec/ rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 213 with C or better or BA 213H with C or better) and (BA 270 [C] or BA 270H [C] or BA 302 [C]) and (BA 275 [C] or BA 275H [C] or BA 276 [C])
Equivalent to: ACTG 378

AEC 250H. INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: AEC 250

AEC 399H. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Attributes: HNRS – Honors Course Designator
Equivalent to: AEC 399, AREC 399
This course is repeatable for 8 credits.

AEC 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: AEC 407, AREC 407, AREC 407H
This course is repeatable for 16 credits.

ALS 199H. SPECIAL TOPICS. (0-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ALS 199
This course is repeatable for 9 credits.

ANS 121H. INTRODUCTION TO ANIMAL SCIENCES. (4 Credits)
Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: ANS 121

ANTH 210 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 311H. PEOPLES WORLD-NORTH AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 311
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 312H. PEOPLES WORLD-EUROPE. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (Bacc Core Course)
Attributes: CPDC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: ANTH 312
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 313H. PEOPLES OF THE WORLD-LATIN AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 313
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 314H. PEOPLES OF THE WORLD-MIDDLE EAST. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 314
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 315H. PEOPLES OF THE WORLD-AFRICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 315
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.
ANTH 318H. *PEOPLES OF THE WORLD–CHINA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Prerequisites: ANTH 110 with D- or better or ANTH 210 with D- or better
Equivalent to: ANTH 318
Recommended: Completion of social processes and institutions requirement

ANTH 374H. *ANTHROPOLOGY AND GLOBAL HEALTH. (3 Credits)
An overview of historical and contemporary issues in gender health with emphasis on politics, globalization, and the complex outcomes of interventions in diverse cultural settings. Students will articulate a critical and evidence-based perspective on complex global health issues. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: ANTH 374

ANTH 380H. *CULTURES IN CONFLICT. (3 Credits)
Communication and commerce draw East and West, industrial and pre-industrial, state and stateless societies together. Beliefs and values clash and complement one another. Explores the processes of intercultural contact, cross-cultural interaction, and the consequences of global penetration of European-American culture. Evaluates theoretical explanations for cultural persistence and change. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: ANTH 380
Recommended: Completion of non-Western Cultures requirement

ANTH 383H. *INTRODUCTION TO MEDICAL ANTHROPOLOGY. (3 Credits)
Examines human health and healing systems from evolutionary and cross-cultural perspectives. Using a case study approach, this class explores individual- and population-level experiences of illness and healing, while providing students with the tools to evaluate global disease patterns and international health promotion and education programs. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: ANTH 383

ANTH 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: ANTH 399

ANTH 405H. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.
Equivalent to: ANTH 405

ANTH 407H. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.
Equivalent to: ANTH 407

ANTH 432H. *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION. (4 Credits)
Reviews the development of culture in the Old and New Worlds with special emphasis placed on the when, where, and how of early domestication of plants and animals. Examines the process of urbanization. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ANTH 432
Recommended: 6 credits of anthropology

ANTH 447H. *ARCTIC PERSPECTIVES ON GLOBAL PROBLEMS. (4 Credits)
The Arctic is on the forefront of today’s most pressing problems. This course uses Arctic perspectives to explore issues affecting us all: climate change, environmental conservation, traditional ecological knowledge, development, energy extraction, indigenous rights, and indigenous media. Using insights from Arctic perspectives, we will plot pathways toward potential solutions. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: ANTH 447

ANTH 481H. *NATURAL RESOURCES AND COMMUNITY VALUES. (3 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Recommended: 3 credits of social science

ANTH 499H. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: ANTH 499

BA 160H. B-ENGAGED. (3 Credits)
Understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Opportunity to connect with faculty and peers with common interests in a supportive learning environment.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 160, BA 163

BA 161H. INNOVATION NATION–AWARENESS TO ACTION. (3 Credits)
First course in a two-course sequence. Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today’s global market. Builds a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 161, BA 167

BA 162H. INNOVATION NATION–IDEAS TO REALITY. (3 Credits)
Second course in a two-course sequence. Topics include evaluating entrepreneurial capabilities, creativity and innovation, opportunity recognition, impression management, and responsible business practices. Continues a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today’s global market.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 161 with C- or better or BA 161H with C- or better
Equivalent to: BA 162, BA 168
BA 211H. FINANCIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of external users, principally investors and creditors. Emphasis on the preparation and interpretation of financial statements, income recognition and determination, and asset valuation.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 60
Equivalent to: BA 211

BA 213H. MANAGERIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of management users with an emphasis on data accumulation for product costing, planning, and performance evaluation and control.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 211 with C- or better or BA 211H with C- or better
Equivalent to: BA 213

BA 223H. PRINCIPLES OF MARKETING. (4 Credits)
Covers concepts and principles used by marketing professionals. Designed explicitly for business majors, it's an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.
Attributes: HNRS – Honors Course Designator
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: BA 223, BA 390, BA 390H

BA 230H. BUSINESS LAW I. (4 Credits)
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 230

BA 233H. LEGAL ENVIRONMENT OF BUSINESS. (2 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 233

BA 240H. FINANCE. (4 Credits)
Introduces basic tools of finance and applications of financial theory in use today. These tools include rates of return, the time value of money, those that can be applied to capital budgeting decisions, and the logic and fundamentals of financial statements. It is designed to enhance a student's approach to financial decision-making and emphasizes quantitative approaches to decision making. This course will also introduce students to equity and debt markets and securities, and serves as a stepping stone to advanced courses in finance.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 211 with C- or better or BA 211H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 240, BA 360, BA 360H

BA 253H. PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to improve the ability of students to describe their accomplishments and sell their ideas in situations like professional networking, company meetings, response to proposals for services, and interviews. It teaches writing skills and workplace integration for new jobs. Particular emphasis is put on verbal communication and preparation for verbal communication. Students will learn to create career plans that require them to research career options and potential employers, and prepare a developmental roadmap that will lead them to success within the chosen profession.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 101 with C- or better or BA 162 with C- or better or DHE 160 with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-])
Equivalent to: BA 253, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 260H. INTRODUCTION TO ENTREPRENEURSHIP. (4 Credits)
Topics include evaluating entrepreneurial capabilities, creativity, business plan creation, opportunity assessment and feasibility analysis, business implementation, new product introduction, and seeking funds.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 260

BA 270H. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Introduces and integrates some core concepts from Operations Management (OM) and Business Information System (BIS) disciplines by introducing a process-oriented view of the flows of materials, information, products and services through and across organizational functions. Helps students to: identify information-bearing events and actors, model and analyze business processes, assess and improve process efficiency, recognize probabilistic components of business processes and understand the interactions between human behavior and process design. Hands-on, case-based assignments allow for practicing some principles and concepts addressed in the course.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 270, BA 302, BA 302H

BA 275H. FOUNDATIONS OF STATISTICAL INFERENCE. (4 Credits)
An introductory course on statistical inference with an emphasis on business applications. Coverage includes descriptive statistics, random variables, probability distributions, sampling and sampling distributions, statistical inference for means and proportions using one and two samples, and linear regression analysis.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or MTH 111 with C- or better or Math Placement - ALEKS with a score of 046
Equivalent to: BA 275, BA 276

BA 281H. PROFESSIONAL DEVELOPMENT. (3 Credits)
Designed to give students an early start on the process of career planning and development. The process involves thoughtful self-assessment, career exploration, planning and follow-through with preliminary employment strategies.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 101 with C- or better and BA 280 [C-]) or BA 162 [C-] or BA 162H [C-]
Equivalent to: BA 253, BA 253H, BA 281, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253
BA 333H. LEGAL AND ETHICAL BUSINESS SOLUTIONS. (2 Credits)
Legal and ethical regulations of U.S. and global business organizations including financial, human resources, operations and marketing functions. Emphasizes legal and ethical strategies for entrepreneurs including business entity selection, raising capital and managing intellectual property.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 230 with C- or better or BA 233 with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 333

BA 347H. INTERNATIONAL BUSINESS. (4 Credits)
Integrated view of international business including current patterns of international business, socioeconomic and geopolitical systems within countries as they affect the conduct of business, major theories explaining international business transactions, financial forms and institutions that facilitate international transactions, and the interface between nation states and the firms conducting foreign business activities.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ECON 202 with C- or better or ECON 202H with C- or better) and (BA 230 [C-] or BA 230H [C-] or BA 330 [C-])
Equivalent to: BA 347

BA 352H. MANAGING INDIVIDUAL AND TEAM PERFORMANCE. (4 Credits)
Diagnose individual and small-group behavior and develop skill in improving individual and small-group performance in entrepreneurial and established ventures. Emphasis on professional skill development and the practical application of theory and research. Concepts of ethics, diversity and cross-cultural relations are integrated throughout the course.
Attributes: HNRS – Honors Course Designator
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 352

BA 354H. MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces contemporary issues that business professionals face making ethical and socially responsible decisions in an increasingly fast-paced, transparent, and global environment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 354, MGMT 459

BA 357H. OPERATIONS MANAGEMENT. (4 Credits)
Decision making in managing the production of goods and services: product planning, process planning, facility planning, control of quantity, cost and quality. Special emphasis on exponential forecasting, inventory management, work methods, project management, productivity improvement, and international comparisons.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better or BA 276 with C- or better)
Equivalent to: BA 357

BA 360H. INTRODUCTION TO FINANCIAL MANAGEMENT. (4 Credits)
Explore the issues facing a financial manager in new business ventures, small businesses, and corporations. Focus on the role of the financial manager in business settings, explores the functions of a financial manager in financial analysis, forecasting, planning, and control; asset and liability management; capital budgeting; and raising funds for new business ventures, small businesses, and corporations.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 213 with C- or better or BA 213H with C- or better or BA 215 with C- or better or BA 215H with C- or better or BA 315 with C- or better) and (ECON 201 [C-] or ECON 201H [C-] or AEC 250 [C-] or AEC 250H [C-])
Equivalent to: BA 240, BA 240H, BA 360

BA 375H. APPLIED QUANTITATIVE METHODS. (4 Credits)
Introduces students to the basics of data science and data analytics for handling of large-scale databases. It provides an overview of the main data-analytic techniques and topics including data visualization, linear and nonlinear regression analysis, time series analysis and forecasting, classification, and clustering methods.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 275 with C- or better or BA 275H with C- or better)
Equivalent to: BA 375

BA 390H. MARKETING. (4 Credits)
Consumer and industrial markets, and activities and enterprises involved in distributing products to those markets. Objective is to develop an understanding of distribution processes, marketing problems, and marketing principles.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ECON 201 with C- or better or ECON 201H with C- or better or (AREC 250 with C- or better or AEC 250 with C- or better))
Equivalent to: BA 223, BA 223H, BA 390

BA 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 407
This course is repeatable for 16 credits.

BA 465H. SYSTEMS THINKING AND PRACTICE. (4 Credits)
Hard and soft systems theories are examined, including methods and techniques for dealing with real-world problems; skills and dialogue techniques to identify mindsets, define problems, and explore alternative pathways for solutions.
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: BA 465

BA 466H. INTEGRATIVE STRATEGIC EXPERIENCE. (4 Credits)
Provides students with an overview of the basic concepts in strategic management. Students learn frameworks and models to understand and analyze a firm’s external environment and internal resources in an effort to create sustainable competitive advantages. Analysis and critique of conventional conceptions of business ethics. Evaluation of ethical issues involving businesses at firm, national, and international levels.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BA 240 with C- or better or BA 240H with C- or better or FIN 340 with C- or better or FIN 340H with C- or better or BA 360 with C- or better or BA 360H with C- or better) and (BA 352 [C-] or BA 352H [C-]) and (BA 357 [C-] or BA 357H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-]))
Equivalent to: BA 466
BB 314H. CELL AND MOLECULAR BIOLOGY. (4 Credits)
Fundamental concepts of prokaryotic and eukaryotic cell biology. Emphasizes cell structure and function at the molecular level. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 331 (may be taken concurrently) [C-] or CH 334 (may be taken concurrently) [C-])
Equivalent to: BB 314, BI 314H

BB 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 399
This course is repeatable for 16 credits.

BB 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 405
This course is repeatable for 16 credits.

BB 407H. BIOCHEMISTRY/BIOPHYSICS SEMINAR. (1-16 Credits)
Informal seminars presenting information about research problems and careers in research programs on campus in biochemistry or biophysics.
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 407
This course is repeatable for 99 credits.

BEE 407H. SEMINAR. (1-16 Credits)
Departmental seminars. Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BEE 407
This course is repeatable for 16 credits.

BEE 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BEE 499
This course is repeatable for 16 credits.

BI 199H. SELECTED TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 199
This course is repeatable for 16 credits.

BI 211H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Origins of life, energy transformations, plant and animal physiology. Lec/ lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: BI 211

BI 212H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Cell biology, organ systems, plant and animal physiology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Prerequisites: (CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or CH 221 (may be taken concurrently) with D- or better or CH 224H (may be taken concurrently) with D- or better or CH 231 with D- or better or CH 231H with D- or better) and (CH 261 (may be taken concurrently) [D-] or CH 261H (may be taken concurrently) [D-])
Equivalent to: BI 212

BI 213H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Genetics, evolution, natural selection, and ecology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Prerequisites: CH 121 with D- or better or CH 201 with D- or better or CH 221 with D- or better or CH 224H with D- or better or (CH 231 with D- or better or CH 231H with D- or better) and (CH 261 [D-] or CH 261H [D-] or CH 271 [D-])
Equivalent to: BI 213

BI 306H. **ENVIRONMENTAL ECOLOGY. (3 Credits)
Biological, physical, and chemical nature of both natural and human-disturbed ecosystems. Topics include population and conservation ecology, toxins in the food chain and in the environment, forest decline and acid rain, eutrophication of terrestrial and aquatic ecosystems, and ecosystem restoration. Offered alternate years. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: BI 306
Recommended: One year of college biology and chemistry

BI 311H. GENETICS. (4 Credits)
Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: BI 311

BI 370H. ECOLOGY. (3 Credits)
The study of interactions between organisms and their biotic and abiotic environments at the population, community, ecosystem, and biosphere levels of organization.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: BI 370

BI 401H. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 401
This course is repeatable for 16 credits.

BI 407H. SEMINAR. (1 Credit)
Departmental seminar. Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 407
This course is repeatable for 16 credits.

BI 445H. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Attributes: HNRS – Honors Course Designator
Prerequisites: BI 311 with D- or better or BI 311H with D- or better
Equivalent to: BI 445
BI 499H. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary.
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 499
This course is repeatable for 16 credits.

BOT 407H. SEMINAR. (1 Credit)
Section 1: Departmental seminar. Section 3: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BOT 407
This course is repeatable for 16 credits.

BOT 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BOT 499
This course is repeatable for 16 credits.

CBEE 101H. CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION. (3 Credits)
Introduction to the engineering profession in general and in particular the CHE, BIOE, and ENVE programs; development of problem solving strategies and teamwork; analysis and presentation of experimental data, basic process calculations, and design methodologies.
Attributes: HNRS – Honors Course Designator
Equivalent to: CBEE 101

CBEE 102H. ENGINEERING PROBLEM SOLVING AND COMPUTATIONS. (3 Credits)
Elementary programming and problem-solving concepts implemented using MATLAB software; emphasis on problem analysis and development of algorithms in engineering including dimensional analysis; application experiences are established through team-based activities including projects using the LEGO-NXT microprocessor for data acquisition.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better
Equivalent to: CBEE 102

CBEE 211H. MATERIAL BALANCES AND STOICHIOMETRY. (3 Credits)
Material balances, thermophysical, and thermochemical calculations. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: CBEE 211
Recommended: General chemistry and second-year standing in engineering

CBEE 212H. ENERGY BALANCES. (3 Credits)
Energy balances, thermophysical and thermochemical calculations. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (CBEE 211 with C or better or CBEE 211H with C or better) and (MTH 256 (may be taken concurrently) [C] or MTH 256H (may be taken concurrently) [C])
Equivalent to: CBEE 212
Recommended: One year general chemistry and second-year standing in engineering

CBEE 414H. *PROCESS ENGINEERING LABORATORY. (3 Credits)
Unit operations and unit processes; preparation of technical reports. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: CBEE 213 (may be taken concurrently) with C or better and CHE 311 [C] and (CHE 333 [C] or CHE 333H [C])
Equivalent to: CBEE 414

CCE 321H. CIVIL AND CONSTRUCTION ENGINEERING MATERIALS. (4 Credits)
Highway materials; aggregate, concrete and asphalt. Standard test methods.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (ST 314 [C] or BA 276 [C])
Equivalent to: CCE 321

CE 299H. SPECIAL TOPICS. (1-4 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: CE 299

CE 407H. SEMINAR. (1-3 Credits)
Understanding complexity and systems thinking.
Attributes: HNRS – Honors Course Designator
Equivalent to: CE 407
This course is repeatable for 16 credits.

CH 231H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 231H is a lecture course; CH 261H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 261H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: MTH 111 (may be taken concurrently) with C- or better or MTH 112 (may be taken concurrently) with C- or better or MTH 251 (may be taken concurrently) with C- or better or MTH 251H (may be taken concurrently) with C- or better or MTH 252 (may be taken concurrently) with C- or better or MTH 252H (may be taken concurrently) with C- or better or MTH 254 (may be taken concurrently) with C- or better or MTH 254H (may be taken concurrently) with C- or better or Math Placement - ALEKS with a score of 060
Equivalent to: CH 231

CH 232H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pre-pharmacy, and chemical engineering. CH 232H is a lecture course; CH 262H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 262H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: (CH 231 with C- or better or CH 231H with C- or better) or CH 221 with C- or better
Equivalent to: CH 232
CH 233H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 233H is a lecture course; CH 263H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 233H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: (CH 232 with C- or better or CH 232H with C- or better) or CH 222 with C- or better
Equivalent to: CH 233
CH 261H. *LABORATORY FOR CHEMISTRY 231H. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 231H)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Corequisites: CH 231H
Equivalent to: CH 261
CH 262H. *LABORATORY FOR CHEMISTRY 232H. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 232H)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: CH 261 with D- or better or CH 261H with D- or better or CH 271 with D- or better or CH 221 with D- or better or CH 224H with D- or better
Corequisites: CH 232H
Equivalent to: CH 262
CH 263H. *LABORATORY FOR CHEMISTRY 233H. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 233H)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233H
Equivalent to: CH 263
CH 361H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: (CH 361 with D- or better or CH 361H with D- or better) and CH 335 (may be taken concurrently) [D-]
Equivalent to: CH 362
CH 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CH 407
This course is repeatable for 16 credits.
CH 461H. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic and physical chemistry. Lec/Lab.
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 421 (may be taken concurrently) [D-] and CH 440 (may be taken concurrently) [D-]
Equivalent to: CH 461
CH 462H. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 441 (may be taken concurrently) [D-] and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-])
Equivalent to: CH 462
Recommended: CH 422
CH 463H. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-]) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 463
CH 464H. *EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 464
Recommended: CH 461 or CH 461H or CH 461H
CH 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CHE 199
CHE 331H. TRANSPORT PHENOMENA I. (4 Credits)
Fundamentals and application of momentum and energy transfer phenomena to fluid flow for the design of industrial chemical engineering equipment.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (CBEE 212 (may be taken concurrently) [C] or CBEE 212H (may be taken concurrently) [C])
Equivalent to: CHE 331

CHE 332H. TRANSPORT PHENOMENA II. (3 Credits)
A unified treatment using control volume and differential analysis of heat transfer, prediction of heat transport properties, and introduction to heat transfer operations.
Attributes: HNRS – Honors Course Designator
Prerequisites: CHE 311 with C or better and (CHE 331 [C] or CHE 331H [C])
Equivalent to: CHE 332

CHE 333H. TRANSPORT PHENOMENA III. (3 Credits)
A unified treatment using control volume and differential analysis of binary mass transfer, prediction of mass transport properties, and introduction to mass transfer operations. Lec/studio.
Attributes: HNRS – Honors Course Designator
Prerequisites: CHE 331 with C or better or CHE 331H with C or better or CHE 332 with C or better or CHE 332H with C or better
Equivalent to: CHE 333

CHE 405H. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
Attributes: HNRS – Honors Course Designator
Equivalent to: CHE 405

COMM 111H. *PUBLIC SPEAKING. (3 Credits)
Public communication as it relates to informative and persuasive discourse. The theory and practice of public speaking in informative and persuasive contexts. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech; HNRS – Honors Course Designator
Equivalent to: COMM 111

COMM 114H. *ARGUMENT AND CRITICAL DISCOURSE. (3 Credits)
Examination of argumentation as a part of human interaction and investigation. The course emphasizes the processes by which people give reasons to gain adherence and to justify beliefs and actions. The course includes readings, writing, and presentations concerned with the nature of arguments, processes of arguing, and argument criticism. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech; HNRS – Honors Course Designator
Equivalent to: COMM 114

CROP 405H. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
Attributes: HNRS – Honors Course Designator
Equivalent to: CROP 405, CSS 405H

CROP 499H. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (1-16 Credits)
Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Attributes: HNRS – Honors Course Designator
Equivalent to: CROP 499, CSS 499H
This course is repeatable for 16 credits.

CS 160H. COMPUTER SCIENCE ORIENTATION. (3 Credits)
Introduction to the computer science field and profession. Team problem solving. Introduction to writing computer programs. Approaches to teaching course topics vary across sections. Lec/lab.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 160

CS 321H. INTRODUCTION TO THEORY OF COMPUTATION. (3 Credits)
Survey of models of computation including finite automata, formal grammars, and Turing machines.
Attributes: HNRS – Honors Course Designator
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 321

CS 325H. ANALYSIS OF ALGORITHMS. (4 Credits)
Recurrence relations, combinatorics, recursive algorithms, proofs of correctness.
Attributes: HNRS – Honors Course Designator
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 325

CS 391H. *SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE. (3 Credits)
In-depth exploration of the social, psychological, political, and ethical issues surrounding the computer industry and the evolving information society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: CS 391
Recommended: CS 101 or computer literacy

CS 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 407
This course is repeatable for 16 credits.

CS 419H. SELECTED TOPICS IN COMPUTER SCIENCE. (1-5 Credits)
Topics of special and current interest not covered in other courses.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 419
This course is repeatable for 99 credits.

DSGN 244H. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 244

DSGN 341H. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 341

ECE 322H. ELECTRONICS I. (3 Credits)
Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.
Attributes: HNRS – Honors Course Designator
Prerequisites: ENGR 203 with C or better
Equivalent to: ECE 322
ECON 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ECON 399
This course is repeatable for 16 credits.

ED 216H. *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A
DEMOCRACY. (3 Credits)
Introduction to the historical, social, philosophical, political, legal and
economic foundations of education in Oregon, the United States, and
other countries in order to provide a framework from which to analyze
contemporary educational and environmental issues in various schools,
communities, and workplaces. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator
Equivalent to: ED 216

ED 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ED 407, TCE 407
This course is repeatable for 16 credits.

ED 408H. WORKSHOP. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ED 408, TCE 408H
This course is repeatable for 16 credits.

ENG 104H. *INTRODUCTION TO LITERATURE: FICTION. (3 Credits)
Study of fiction for greater understanding and enjoyment. (H) (Bacc Core
Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course
Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 104

ENG 106H. *INTRODUCTION TO LITERATURE: POETRY. (3 Credits)
Study of poetry for greater understanding and enjoyment. (H) (Bacc Core
Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course
Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 106

ENG 201H. *SHAKESPEARE. (4 Credits)
The earlier plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture; HNRS – Honors Course Designator; LACH – Liberal Arts
Humanities Core
Equivalent to: ENG 201

ENG 202H. *SHAKESPEARE. (4 Credits)
The later plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture; HNRS – Honors Course Designator; LACH – Liberal Arts
Humanities Core
Equivalent to: ENG 202

ENG 204H. *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660. (4
Credits)
English literature presented in chronological sequence. (H) (Bacc Core
Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture; HNRS – Honors Course Designator; LACH – Liberal Arts
Humanities Core
Equivalent to: ENG 204

ENG 205H. *SURVEY OF BRITISH LITERATURE: RESTORATION TO
ROMANTIC ERA. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core
Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture; HNRS – Honors Course Designator; LACH – Liberal Arts
Humanities Core
Equivalent to: ENG 205

ENG 211H. *LITCS OF THE WORLD: AFRICA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern
cultural traditions. Covers literature of Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and
Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities
Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ENG 211

ENG 213H. *LITERATURES OF THE WORLD: MIDDLE EAST. (4 Credits)
This course is repeatable for 16 credits.

ENG 217H. *LITERATURES OF THE WORLD: ASIA. (4 Credits)
This course is repeatable for 16 credits.

ENG 218H. *LITERATURES OF THE WORLD: NORTH AMERICA. (4
Credits)
This course is repeatable for 16 credits.

ENG 220H. *SURVEY OF BRITISH LITERATURE: 1660 TO 1800. (4
Credits)
This course is repeatable for 16 credits.

ENG 221H. *AFRICAN-AMERICAN LITERATURE. (4 Credits)
This course is repeatable for 16 credits.

ENG 224H. *AFRICAN-AMERICAN LITERATURE II. (4 Credits)
This course is repeatable for 16 credits.

ENG 225H. *STUDY OF AMERICAN LITERATURE: 1800 TO 1865. (4
Credits)
This course is repeatable for 16 credits.

ENG 226H. *AFRICAN-AMERICAN LITERATURE III. (4 Credits)
This course is repeatable for 16 credits.

ENG 254H. *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT. (4
Credits)
This course is repeatable for 16 credits.

ENG 254H. *SURVEY OF AMERICAN LITERATURE II: 1900 TO PRESENT. (4
Credits)
This course is repeatable for 16 credits.

ENG 254H. *SURVEY OF AMERICAN LITERATURE III: 1900 TO PRESENT. (4
Credits)
This course is repeatable for 16 credits.

ENG 260H. *LITERATURE OF AMERICAN MINORITIES. (4 Credits)
This course is repeatable for 16 credits.

ENG 260H. *LITERATURE OF AMERICAN MINORITIES II. (4 Credits)
This course is repeatable for 16 credits.

ENG 260H. *LITERATURE OF AMERICAN MINORITIES III. (4 Credits)
This course is repeatable for 16 credits.
ENG 275H. *THE BIBLE AS LITERATURE. (4 Credits)
Biblical structure, literary types, ideas, influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENGR 275

ENG 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSTOOLISTED as ENGR 295/PHIL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, PHIL 295, PHIL 295H, WGSS 295, WGSS 295H

ENG 374H. *MODERN SHORT STORY. (4 Credits)
Survey of the short story from the 19th century to present. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENGR 374

ENG 375H. CHILDREN'S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 375

ENG 399H. SELECTED TOPICS. (1-16 Credits)
(H)
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENGR 399
This course is repeatable for 16 credits.

ENG 406H. PROJECTS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 406
This course is repeatable for 16 credits.

ENGR 112H. INTRODUCTION TO ENGINEERING COMPUTING. (3 Credits)
Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software. Lec/lab/rec.
Attributes: HNRS – Honors Course Designator

ENGR 201H. ELECTRICAL FUNDAMENTALS I. (3 Credits)
Analysis of linear circuits. Circuit laws and theorems. DC responses of circuits. Operational amplifier characteristics and applications. Lec./lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 251 with C or better or MTH 251H with C or better) and (MTH 252 [C] or MTH 252H [C])
Equivalent to: ENGR 201

ENGR 211H. STATICS. (3 Credits)
Analysis of forces induced in structures and machines by various types of loading. Lec./rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: ENGR 211

ENGR 212H. DYNAMICS. (3 Credits)
Kinematics, Newton's laws of motion, and work-energy and impulse-momentum relationships applied to engineering systems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENG 211 with C or better or ENGR 211H with C or better) and (PH 211 [C] or PH 211H [C])
Equivalent to: ENGR 212

ENGR 213H. STRENGTH OF MATERIALS. (3 Credits)
Properties of structural materials; analysis of stress and deformation in axially loaded members, circular shafts, and beams, and in statically indeterminate systems containing these components. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better
Equivalent to: ENGR 213

ENGR 299H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 299
This course is repeatable for 16 credits.

ENGR 350H. *SUSTAINABLE ENGINEERING. (3 Credits)
Examination of technological innovations and alternatives required to maintain human quality of life and environmental sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ENGR 350

ENGR 363H. *ENERGY MATTERS. (3 Credits)
Establishes a basic energy vocabulary, applies the fundamental concepts of identifying energy and determining efficiency, and studies the implications of energy decisions in the context of traditional, alternative, and sustainable energy resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ENGR 363
Recommended: MTH 112 or higher

ENGR 391H. ENGINEERING ECONOMICS AND PROJECT MANAGEMENT. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Economic, time, and performance parameters of engineering projects are analyzed from the organizational and resource perspectives. Network optimization and simulation concepts are introduced. Fundamental engineering economics concepts are introduced and applied to planning and managing projects.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 391

ENGR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 399
This course is repeatable for 16 credits.

ENGR 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator

ENGR 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 499
This course is repeatable for 16 credits.
ENSC 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENSC 407
This course is repeatable for 12 credits.

ENVE 299H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 299
This course is repeatable for 16 credits.

ENVE 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 407
This course is repeatable for 16 credits.

**ES 221H. *SURVEY OF AFRICAN AMERICAN STUDIES I. (3 Credits)*
An interdisciplinary survey of the African American experience beginning with pre-colonial Africa and ending with World War I. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 221

**ES 223H. *SURVEY OF AFRICAN AMERICAN STUDIES II. (4 Credits)*
An interdisciplinary survey of the African American experience from World War I to the present. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ES 223

**ES 241H. *INTRODUCTION TO NATIVE AMERICAN STUDIES. (4 Credits)*
A survey of Native American cultures and history, both prior to and following contact with Europeans. Introduces the key contemporary issues and questions in the field of Native American studies. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 241

**ES 353H. *ENVIRONMENTAL RACISM. (4 Credits)*
Introduces environmental racism, the unequal impact of environmental harm on communities of color and indigenous peoples. Presents empirical evidence and theoretical frames, and explores efforts by government, residents, and activists to combat it. Considers questions of environmental justice via social structure, public access, open space, indigeneity, food, and media. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 353

**ES 355H. *RACE, SPACE, AND DIFFERENCE. (4 Credits)*
A hands-on approach to exploring how we make space, and why geography is always infused with markers of social identity and exercises of power. Will practice ‘reading’ space and landscapes, and learn how notions of race and other forms of ‘difference’ shape space and (vice versa) to produce experiences of inclusion, exclusion, cooperation, and conflict. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 355

**ES 357H. *FARMWORKER JUSTICE MOVEMENTS. (4 Credits)*
Justice movements for farmworkers have a long and storied past in the annals of US history. This course begins with the 1960s Chicano civil rights era struggles for social justice. Focus on the varied strategies of four farmworker justice movements: United Farm Workers, Farm Labor Organizing Committee, Pineros y Campesinos Unidos Noroeste, and the Coalition of Immokalee Workers. The course is structured around the question of the movement and its various articulations. Course covers central themes and strategies that comprise the core of farmworker movements but is designed to allow students to explore other articulations they find relevant. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 357

**ES 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ES 399
This course is repeatable for 16 credits.

**ES 445H. *NATIVE AMERICAN SCIENCE AND TECHNOLOGY. (4 Credits)*
Examination of scientific and technological discovery, continuity, and change among indigenous peoples, with particular emphasis on selected communities of pre- and post-European contact North America. (Bacc Core Course) (H) (NC)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 445

**FES 240H. *FOREST BIOLOGY. (4 Credits)*
Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: FES 240

**FILM 245H. *THE NEW AMERICAN CINEMA. (4 Credits)*
A formalist, ideological, and commercial investigation into contemporary American cinema. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 245, ENG 245H, FILM 245

**FILM 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: FILM 399
This course is repeatable for 16 credits.

**FILM 452H. *STUDIES IN FILM. (4 Credits)*
Particular cinematographers, movements, types, conventions, or problems in film. Topics change from term to term. Lecture and separate screenings each week. Film fee required. Not offered every year. (H)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 452, FILM 452
This course is repeatable for 8 credits.

**Recommended:** Sophomore standing; 8 credits of ENG 200-level or above
FIN 340H. FINANCE. (4 Credits)
Role and functions of a financial manager in the modern business environment in which a manager operates; formulation of financial objectives and policies; financial analysis, forecasting, planning, and control; asset management; capital budgeting; acquisition of funds through borrowing, stock issue, and by internal means; dividend policy; and international aspects of finance.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BA 213 with C- or better or BA 215 with C- or better or BA 215H with C- or better) and (ECON 201 [C-] or ECON 201H [C-]))
Equivalent to: BA 340, BA 340H, FIN 340

FOR 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FR 499H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 9 credits.

GEO 307H. SEMINAR. (1-16 Credits)
Graded P/N. Taught at Hatfield Marine Science Center.
Attributes: HNRS – Honors Course Designator
Equivalent to: FW 407
This course is repeatable for 16 credits.

GEO 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

H 100H. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 100

H 364H. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulant compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual’s value orientation.
Attributes: HNRS – Honors Course Designator
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364

H 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
H 407H. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 407H
Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option
H 491H. SPECIAL TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 491H
This course is repeatable for 6 credits.
HC 001. SERVICE LEARNING. (0 Credits)
Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the experience in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.
Attributes: HNRS – Honors Course Designator
HC 002. LEADERSHIP. (0 Credits)
Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.
Attributes: HNRS – Honors Course Designator
HC 199. *HONORS WRITING. (3 Credits)
Through a range of assignments, texts, and guest speakers, Honors College students will develop critical thinking skills and a strategy for writing in their discipline. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator
Prerequisites: WR 121 with D- or better or WR 121H with D- or better
HC 299. SELECTED TOPICS. (1-16 Credits)
Selected topics for Honors College students.
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 399. SELECTED TOPICS. (1-16 Credits)
Upper-division special topics for Honors College students.
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 402. INDEPENDENT STUDY. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 403. THESIS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 404. WRITING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 405. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 406. PROJECTS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 407. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 18 credits.
HC 408. WORKSHOP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 409. PRACTICUM. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HC 499. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.
HDFS 447H. *FAMILIES AND POVERTY. (4 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HDFS 447
HDFS 465H. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
Attributes: HNRS – Honors Course Designator
Equivalent to: HDFS 465
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY
HDFS 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HDFS 499
This course is repeatable for 16 credits.
HHS 231H. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness; HNRS – Honors Course Designator
Equivalent to: HHS 231
HORT 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 199
This course is repeatable for 16 credits.
HST 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 299
This course is repeatable for 16 credits.

HORT 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 405
This course is repeatable for 16 credits.

HORT 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 499
This course is repeatable for 16 credits.

HST 105H. *WORLD HISTORY II: MIDDLE AND EARLY MODERN AGES. (3 Credits)
A survey of the historical development of several world civilizations roughly from the 8th century to the late 18th century. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 105

HST 106H. *WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD. (3 Credits)
A survey of the historical development of several world civilizations from the 18th century to the contemporary period. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 106

HST 201H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1920 to present. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 201

HST 202H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1820 to 1920. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 202

HST 203H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1920 to present. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 203

HST 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, PHL 210, PHL 210H, REL 210, REL 210H

HST 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HST 299
This course is repeatable for 16 credits.

HST 317H. *WHY WAR: A HISTORICAL PERSPECTIVE. (4 Credits)
An inquiry into the origins of mass violence. Theory and case studies are used to suggest possible causes of international war, civil war, revolution, and genocide. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 317

HST 324H. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 324

HST 350H. *MODERN LATIN AMERICA. (4 Credits)
History of Latin America leading up to and after Spanish and Portuguese conquest. Focus on indigenous American, European and African cultures and religions in contact under colonial government and economic systems. Covers the period from 1400 to 1810. CROSSLISTED as HST 350/REL 350. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 350, REL 350
HST 365H. *THE CIVIL RIGHTS MOVEMENT IN THE MODERN U.S.. (4 Credits)
An exploration of the 'long civil rights movement' among African Americans and their allies during the 20th century United States, with attention to the structure of racial inequality, movement philosophies and strategies, white allies and opponents, relationships to other freedom movements, and the movement's legacies. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 365

HST 382H. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Nineteenth and Twentieth century Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 382

HST 385H. *THE ARAB-ISRAELI CONFLICT. (4 Credits)
Examination of the origins of the Arab-Israeli conflict and subsequent efforts to find a lasting solution. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 385

HST 386H. *MODERN IRAN: REVOLUTION AND ITS AFTERMATH. (4 Credits)
The history of 20th century Iran with a focus on the Islamic revolution and its consequences. Readings will provide the cultural and political background for understanding contemporary Iran and its place in the world. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HST 386

HST 390H. *MIDEAST WOMEN: IN THEIR OWN WORDS. (4 Credits)
The lives of modern Middle Eastern women as told in memoirs, autobiography and film. First-person narratives and film portrayals provide the means for understanding historical events and contemporary trends in the region. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HST 390

HST 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HST 407H. *SEMINAR. (5 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: HST 407
This course is repeatable for 20 credits.

HST 415H. SELECTED TOPICS. (4 Credits)
Selected topics of special or current interest not covered in other courses. (H)
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 415
This course is repeatable for 99 credits.

HST 425H. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history, other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425, REL 425, REL 425H

HST 432H. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present. (H) (SS)
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 432

HST 465H. *AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/ HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 465
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing

HST 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HST 499
This course is repeatable for 16 credits.

HST 415H. **THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin's theory of evolution. Reception of theory and history of evolution to the present. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 415

HST 417H. **HISTORY OF MEDICINE. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 417

HST 419H. **STUDIES IN SCIENTIFIC CONTROVERSY: METHODS AND PRACTICES. (4 Credits)
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 419
HSTS 440H. *HISTORY OF PSYCHOTHERAPY. (4 Credits)
The history of psychotherapy in modern Western societies, from
biomedical, cultural, political, and psychosocial perspectives. Not offered
every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS
– Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 440

KIN 399H. SPECIAL TOPICS. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: KIN 399
This course is repeatable for 18 credits.

MB 230H. *INTRODUCTORY MICROBIOLOGY. (4 Credits)
Microbiology as it affects our everyday lives. The impact of
microorganisms on health, food/water sanitation, environment, industry,
and genetic engineering. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: MB 230

MB 299H. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: MB 299
This course is repeatable for 16 credits.

MB 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: MB 399
This course is repeatable for 16 credits.

ME 299H. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: ME 299
This course is repeatable for 16 credits.

ME 311H. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy moment and the second
law of thermodynamics are included. CROSSLISTED as ME 311/NSE 311.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better)
and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ENGR 311, ENGR 311H, ME 311, ME 311H, NSE 311, NSE 311H

ME 312H. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding
states, non-reactive gas mixtures, reactive mixtures, thermodynamics of
compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better)
and (ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or ME 311 [C] or ME 311H [C])
Equivalent to: ME 312, NE 312, NE 312H, NSE 312, NSE 312H

ME 317H. INTERMEDIATE DYNAMICS. (4 Credits)
Continuation of the study of kinematics and kinetics of particles and rigid
bodies, with applications to mechanical systems of current interest to
engineers.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((ENGR 212 with C or better or ENGR 212H with C or better)
and (MTH 256 [C] or MTH 256H [C])]
Equivalent to: ME 317

ME 331H. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and
dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((MTH 254 with C or better or MTH 254H with C or better)
and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C])
and (ENGR 311 [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or ME 311 [C] or ME 311H [C])]
Equivalent to: ME 331, NE 331, NE 331H, NSE 331, NSE 331H

ME 332H. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer
using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((MTH 256 with C or better or MTH 256H with C or better)
and (ENGR 212 [C] or ENGR 212H [C]) and (ME 311 [C] or ME 311H [C] or NE 311 [C] or NE 311H [C])
and (ME 331 [C] or ME 331H [C] or NSE 311 [C]) or NSE 331H [C] or ME 331H [C] or NSE 331 [C] or NE 331H [C])
Equivalent to: ENGR 332, ME 332, NE 332H, NSE 332, NSE 332H

ME 373H. MECHANICAL ENGINEERING METHODS. (3 Credits)
Analytical and numerical methods for solving representative mechanical engineering problems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 112 with C or better or ENGR 112H with C or better)
and (MTH 256 [C] or MTH 256H [C]) and MTH 341 [C]
Equivalent to: ME 373

ME 382H. INTRODUCTION TO DESIGN. (4 Credits)
Organization, planning, economics, and the use of creativity and optimization in solving mechanical design problems. Case studies and/or industrial design problems. Lec/lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: ENGR 248 with C or better and ME 250 (may be taken concurrently) [C] and (PH 211 [C] or PH 211H [C])
Equivalent to: ME 382

ME 383H. MECHANICAL COMPONENT DESIGN. (4 Credits)
Failure analysis and design of machine components. Lec/lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: ME 316 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 212H [C]) and ENGR 213 [C]
Equivalent to: ME 383

ME 405H. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 9 credits.

ME 422H. MECHANICAL VIBRATIONS. (4 Credits)
Dynamic response of single and multiple degree-of-freedom systems.
Attributes: HNRS – Honors Course Designator
Prerequisites: ME 317 with C or better or ME 317H with C or better
Equivalent to: ME 422
ME 430H. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSLISTED as ECE 451/ME 430.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 317 with C or better or ME 317H with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C]))
Equivalent to: ECE 451, ME 430

ME 452H. THERMAL AND FLUIDS SCIENCES LABORATORY. (4 Credits)
Course emphasis is on experiments related to thermodynamics, heat transfer, and fluid mechanics. Proper experimental methods, data and uncertainty analysis related to thermal and fluids measurements are discussed.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 311 with C or better or ME 311H with C or better) and (ME 331 [C] or ME 331H [C]) and (ME 332 [C] or ME 332H [C])
Equivalent to: ME 452

ME 499H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ME 499
This course is repeatable for 16 credits.

MIME 101H. INTRODUCTION TO MIME. (3 Credits)
Provides students with an overview of mechanical, industrial, manufacturing, and energy systems engineering careers and an introduction to technical areas of study. Skills necessary for success in both the academic curriculum and in the engineering profession will also be emphasized, including communication and ethics. Lec/rec.
Attributes: HNRS – Honors Course Designator
Equivalent to: MIME 101

MTH 231H. ELEMENTS OF DISCRETE MATHEMATICS. (4 Credits)
Elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: MTH 231

MTH 251H. *DIFFERENTIAL CALCULUS. (4 Credits)
Differential calculus for engineers and scientists. Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math; HNRS – Honors Course Designator
Prerequisites: MTH 112 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 075
Equivalent to: MTH 251

MTH 252H. INTEGRAL CALCULUS. (4 Credits)
Definite integrals, elementary applications to area, force, and work. Integral tables and basic techniques of integration, calculus of logarithmic and exponential functions, polar coordinates, applications to areas, volumes, force, work, and growth and decay problems. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 251 with C- or better or MTH 251H with C- or better
Equivalent to: MTH 252

MTH 254H. VECTOR CALCULUS I. (4 Credits)
Vectors, vector functions, and curves in two and three dimensions. Surfaces, partial derivatives, gradients, and directional derivatives. Multiple integrals in rectangular, polar, cylindrical, and spherical coordinates. Physical and geometric applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 254

MTH 255H. VECTOR CALCULUS II. (4 Credits)
Brief review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss and Stokes with applications to force, work, mass, and charge. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 255

MTH 256H. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler’s identities is highly desirable.) All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256

MTH 264H. INTRODUCTION TO SERIES. (2 Credits)
Introduction to matrix algebra: systematic solution to systems of linear equations. Applications to electric circuits and mechanical oscillators. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler’s identities is highly desirable.) All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256

MTH 265H. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSLISTED as ECE 451/ME 430.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 317 with C or better or ME 317H with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C]))
Equivalent to: ECE 451, ME 430
MTH 306H. MATRIX AND POWER SERIES METHODS. (4 Credits)
Introduction to matrix algebra, determinants, systematic solution to linear systems, and eigenvalue problems. Convergence and divergence of series with emphasis on power series, Taylor series expansions, convergence tests for power series, and error estimates for truncated series used in practical approximations. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 306

MTH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: MTH 399
This course is repeatable for 16 credits.

MUS 101H. *MUSIC APPRECIATION I: SURVEY. (3 Credits)
Dealing primarily with the Western classical tradition, the course focuses on developing perceptive listening skills through the study of musical forms and styles. For non-majors. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 101
This course is repeatable for 12 credits.

MUS 102H. *MUSIC APPRECIATION II: PERIODS AND GENRES. (3 Credits)
A study of the masterworks of a single era (such as Baroque, classic, romantic, twentieth century) or a genre (such as orchestra, chamber, opera, musical theatre). For non-majors. Need not be taken in order. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 102
This course is repeatable for 12 credits.

MUS 108H. *MUSIC CULTURES OF THE WORLD. (3 Credits)
Survey of the world’s music with attention to musical styles and cultural contexts. Included are Oceania, Indonesia, Africa, Asia, Latin America. For non-majors. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACF – Liberal Arts Non-Western Core
Equivalent to: MUS 108
This course is repeatable for 18 credits.

NR 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: NR 499
This course is repeatable for 18 credits.

OC 399H. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
This course is repeatable for 16 credits.

OC 407H. SEMINAR. (1-3 Credits)
Undergraduate seminar on current developments in the oceanographic research literature, with student presentations and group discussions. A written report may be required.
Attributes: HNRS – Honors Course Designator
Equivalent to: OC 407
This course is repeatable for 12 credits.

PAC 293H. INTERDISCIPLINARY YOGA. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAC 293
This course is repeatable for 11 credits.
PAC 325H. ALI: WILDERNESS FIRST AID. (1 Credit)
Fundamentals of emergency care in a non-urban environment including anatomy, physiology, injury assessment, short-term care, small-group rescues; backcountry emphasis with long-term care and evacuation complications. PAC courses may not be used to fulfill upper-division requirements.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAC 325
This course is repeatable for 11 credits.

PAX 415H. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAX 415
This course is repeatable for 16 credits.

PBG 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 199
This course is repeatable for 16 credits.

PBG 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 299
This course is repeatable for 16 credits.

PBG 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 405
This course is repeatable for 16 credits.

PBG 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PBG 499
This course is repeatable for 16 credits.

PH 104H. *DESCRIPTIVE ASTRONOMY. (4 Credits)
Historical and cultural context of discoveries concerning planets and stars and their motions. Topics include the solar system, the constellations, birth and death of stars, pulsars and black holes. An accompanying laboratory is used for demonstrations, experiments, and projects, as well as for outdoor observations. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Equivalent to: PH 104

PH 211H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: PH 211 with D- or better or PH 211H with D- or better
Equivalent to: PH 212
Recommended: MTH 252 and concurrent enrollment in PH 222 and MTH 254

PH 212H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab.
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: PH 211 with D- or better or PH 211H with D- or better
Equivalent to: PH 222
Recommended: Concurrent enrollment in PH 212 or PH 212H

PH 221H. RECITATION FOR PHYSICS 211. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 211 (may be taken concurrently) with D- or better or PH 211H (may be taken concurrently) with D- or better
Equivalent to: PH 222
Recommended: Concurrent enrollment in PH 212 or PH 212H

PH 222H. RECITATION FOR PHYSICS 212. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 212 (may be taken concurrently) with D- or better or PH 212H (may be taken concurrently) with D- or better
Equivalent to: PH 223
Recommended: Concurrent enrollment in PH 212 or PH 212H

PH 223H. RECITATION FOR PHYSICS 213. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 213 (may be taken concurrently) with D- or better or PH 213H (may be taken concurrently) with D- or better
Equivalent to: PH 223
Recommended: Concurrent enrollment in PH 213

PH 313H. *ENERGY ALTERNATIVES. (3 Credits)
Exploration of the challenges and opportunities posed by dwindling resources; physical and technological basis of our current energy alternatives; new or controversial technologies such as nuclear or solar power; overview of resource availability, patterns of energy consumption, and current governmental policies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: PH 313
Recommended: Upper-division standing and 12 credits of introductory science
PH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PH 399
This course is repeatable for 16 credits.

PH 407H. SEMINAR. (1-16 Credits)
Departmental seminars or colloquium.
Attributes: HNRS – Honors Course Designator
Equivalent to: PH 407
This course is repeatable for 16 credits.

PHL 160H. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam. Lec/rec. CROSSTRADE as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, REL 160, REL 160H

PHL 205H. *ETHICS. (4 Credits)
Introduction to ethical theory and to the evaluation of ethical issues in society such as sexual ethics and euthanasia. Includes the study of philosophical theories of moral responsibility and moral virtue, and the philosophical ideas behind ethics debates in society. Students are encouraged to develop their own positions on ethical issues through discussion projects and term papers. Lec/rec. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 205

PHL 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSTRADE as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210, REL 210, REL 210H

PHL 251H. *KNOWERS, KNOWING, AND THE KNOWN. (4 Credits)
An introduction to the major debates in Western philosophy concerning the nature of reality, and the ways we come to know about that reality. One example concerns debates about the problem of skepticism: Is it possible that humans could be completely mistaken about the way the world is? Another example concerns debates about human identity and free will. Beginning with historical figures such as Descartes and Hume, the course also provides an introduction to more contemporary thinkers. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: PHL 251

PHL 275H. *INTRODUCTION TO DISABILITY STUDIES. (4 Credits)
Introduces core concepts and themes in the multidisciplinary field of disability studies. Analyzes disability as a product of discriminatory, oppressive, and inaccessible built environments and societies. Explores disability pride, culture, and community as alternatives to medical and charity models of disability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PHL 275

PHL 280H. *ETHICS OF DIVERSITY. (4 Credits)
Uses moral philosophy to examine difference-based discrimination and prejudice in the human community. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 280

PHL 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSTRADE as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, WGSS 295, WGSS 295H

PHL 360H. *PHILOSOPHY AND THE ARTS. (4 Credits)
Major philosophical theories about art and its meaning, from ancient to modern times. How philosophers have understood beauty, the imagination, art and knowledge, art and pleasure, art and emotion. Offered every other year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 360

Recommended: 3 credits of philosophy or upper-division standing

PHL 371H. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. Not offered every year. CROSSTRADE as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Non-Western Core
Equivalent to: PHL 371, REL 371

Recommended: 3 credits of philosophy or upper-division standing

PHL 399H. SPECIAL TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific philosophical problem; e.g., Wittgenstein, determinism, perception, philosophy of mind. May be repeated for credit when topic varies. Not offered every term. CROSSTRADE as PHL 399/PHL 399H. (H) (Bacc Core Course)
Attributes: HNRS – Honors Course Designator
Equivalent to: PHL 399

Recommended: 3 credits of upper-division philosophy

PHL 407H. *SEMINAR. (1-16 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: PHL 407
This course is repeatable for 16 credits.

Recommended: Two upper-division philosophy courses and sophomore standing

PHL 430H. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSTRADE as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Non-Western Core
Equivalent to: PHL 430, REL 430

PHL 450H. SEMINAR. (1-16 Credits)
(Research Intensive Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PHL 450
This course is repeatable for 16 credits.

Recommended: 3 credits of philosophy or upper-division standing
**PHL 431H. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)**
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists’ living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.

*Attributes:* HNRS – Honors Course Designator
*Equivalent to:* PHL 431, REL 431

**PHL 434H. *SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)**
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.

*Attributes:* CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
*Equivalent to:* PHL 434, REL 434, REL 434H

**PHL 440H. *ENVIRONMENTAL ETHICS. (3 Credits)**
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity. (H) (Bacc Core Course)

*Attributes:* CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
*Equivalent to:* PHL 440
*Recommended:* PHL 205 and PHL 342 and PHL 365 or 6 credits of philosophy and sophomore standing

**PHL 443H. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)**
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)

*Attributes:* CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
*Equivalent to:* PHL 443, REL 443, REL 443H
*Recommended:* One introductory-level science course and sophomore standing

**PHL 444H. *BIOLOGICAL ETHICS. (4 Credits)**
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)

*Attributes:* CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
*Equivalent to:* PHL 444, REL 444, REL 444H

**PS 405H. READING AND CONFERENCE. (1-16 Credits)**
Theories, research and applications concerning cognition. Topics include perception, attention, memory, learning, thinking and language. 

*Attributes:* HNRS – Honors Course Designator; LACS – Liberal Arts Social Core

*Prerequisites:* PSY 201 with D- or better and PSY 202 [D-]
PSY 360H. SOCIAL PSYCHOLOGY. (4 Credits)
The study of behavior and experience in a social context. Topics include person perception, attribution, attraction and love, attitudes and attitude change, aggression and social influence and group dynamics. Applications of social psychological principles to other fields, e.g., law, health care, etc. (SS)
Attributes: HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 360

PSY 399H. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 30 credits.
Attributes: HNRS – Honors Course Designator
Equivalent to: PSY 399

PSY 499H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Attributes: HNRS – Honors Course Designator
Equivalent to: PSY 499

QS 262H. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia’s and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROS Lis listed as QS 262/WGSS 262. (Bacc Core Course).
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 262, WGSS 262, WGSS 262H

QS 364H. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism.
CROS Lis listed as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 364, WGSS 364, WGSS 364H

REL 160H. *QUESTS FOR MEANING: WORLD RELIGIONS. (0-4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam.
Lec/rec. CROS Lis listed as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, PHL 160H, REL 160

REL 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present.
CROS Lis listed as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210, PHL 210H, REL 210

REL 324H. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROS Lis listed as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: HST 324, HST 324H, REL 324

REL 425H. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year.
CROS Lis listed as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425, HST 425H, REL 425

REL 434H. *SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROS Lis listed as PHL 434/REL 434 and PHL 534/REL 534.
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: PHL 434, PHL 434H, REL 434

REL 443H. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROS Lis listed as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443, PHL 443H, REL 443
Recommended: One introductory-level science course and sophomore standing

REL 444H. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine.
CROS Lis listed as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444, PHL 444H, REL 444

RNG 299H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Attributes: HNRS – Honors Course Designator
Equivalent to: RNG 299
SOC 312H. *SOCIOLOGY OF THE FAMILY. (4 Credits)
Survey of the family as a social institution. Addresses historical and cultural perspectives with emphasis on family diversity, variations in family form and life style, interdependence between family and other institutions, analysis of major family issues, forces for change in the family. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 312

SOC 399H. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses.
Attributes: HNRS – Honors Course Designator
Prerequisites: SOC 204 with C or better
Equivalent to: SOC 444

SOC 444H. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside ‘inside’ students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Attributes: HNRS – Honors Course Designator
Prerequisites: SOC 204 with C or better
Equivalent to: SOC 499
This course is repeatable for 16 credits.

SOC 499H. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students.
Attributes: HNRS – Honors Course Designator
Equivalent to: SOC 499
This course is repeatable for 16 credits.

SOIL 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 199
This course is repeatable for 16 credits.

SOIL 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 299
This course is repeatable for 16 credits.

SOIL 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 405
This course is repeatable for 16 credits.

SOIL 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 499
This course is repeatable for 16 credits.

ST 351H. INTRODUCTION TO STATISTICAL METHODS. (4 Credits)
Study designs, descriptive statistics, collecting and recording data, probability distributions, sampling distributions for means and proportions, hypothesis testing and confidence intervals for means and proportions in one- and two-sample inference, and chi-square tests. Lec/lab.
Attributes: HNRS – Honors Course Designator
Equivalent to: ST 351
Recommended: High school algebra with statistics

TA 147H. *INTRODUCTION TO THE THEATRE. (3 Credits)
Origins, history, nature, elements, and style of theatre production; function of artists and craftspersons of the theatre. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: TA 147

TA 250H. WORKSHOP. THEATRE ARTS. (1-3 Credits)
Practical experience in performance, technical theatre, or design. Maximum for 6 credits may be applied toward graduation.
Attributes: HNRS – Honors Course Designator
Equivalent to: TA 250
This course is repeatable for 6 credits.

TA 360H. *MULTICULTURAL AMERICAN THEATRE. (3 Credits)
Examines the rich panorama of multicultural-American theatre (e.g., African-American, gay and lesbian, Hispanic, Asian American). (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: TA 360

TA 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: TA 407
This course is repeatable for 16 credits.

TA 416H. TOPICS IN THEATRE ARTS. (3 Credits)
Lectures and explorations of theories, issues, methods, problems, and applications in theatre arts. Concentrated work in a variety of selected theatre topics. Offered as demand and staffing allow.
Attributes: HNRS – Honors Course Designator
Equivalent to: TA 416
This course is repeatable for 12 credits.
Recommended: 9 credits of theatre arts

TOX 435H. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: BI 435, BI 435H, FES 435, FES 435, FS 435, FS 435H, TOX 435
Recommended: One quarter each of biology and chemistry

WGSS 223H. *INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES. (3 Credits)
Multidisciplinary introduction to women, gender, and sexuality studies. Focuses on the lives and status of women in society and explores ways institutions such as family, work, media, law and religion affect different groups of women. Explores issues of gender, race, class, age, sexual orientation, size and ability. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
CPSI – Core, Pers, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: WGSS 223, WS 223, WS 223H
WGSS 230H. *WOMEN IN THE MOVIES. (3 Credits)
Examines ways women are depicted in the movies and how those depictions are created by and create larger social constructions of women. Special attention is given to the intersections of race, class, sexual identity, and age with gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WGSS 230

WGSS 235H. *WOMEN IN WORLD CINEMA. (3 Credits)
Explores constructions and practices of gender in a transnational, multi-religious, and global framework by examining a wide variety of films about women around the world. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: WGSS 235, WS 235, WS 235H

WGSS 240H. *GENDER AND SPORT. (3 Credits)
Focuses on sport as a gendered institution. Drawing from cultural, psychosocial, and political perspectives, the course examines intersections of gender with age, sexual orientation, social class, gender identity, race and ethnicity and politics. (Bacc Core Course)
Attributes: CPDP – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: WS 240

WGSS 262H. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia’s and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as GS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WS 262, QS 262H, WGSS 262

WGSS 280H. *WOMEN WORLDWIDE. (3 Credits)
Focuses on women’s experiences throughout the world and examines women’s issues and status cross-culturally. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: WS 280, WS 280H

WGSS 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, PHL 295H, WGSS 295

WGSS 325H. *DISNEY: GENDER, RACE, EMPIRE. (3 Credits)
Explores constructions of gender, race, class, sexuality, and nation in the animated films of Walt Disney; introduces concepts in film theory and criticism, and develops analyses of the politics of representation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WGSS 325

WGSS 340H. *GENDER AND SCIENCE. (3 Credits)
Analyzes the relationship between society and science by explaining technology and science as gendered practices and bodies of knowledge. Focuses on the ways the making of women and men affect the making of science and explores the roles of women in scientific pursuits. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: WS 340, WS 360

WGSS 360H. *MEN AND MASCULINITIES. (3 Credits)
Students will become familiar with central topics in global masculinity studies, analyze texts in diverse media, develop original arguments, and engage with issues of masculinity and representation through written and creative work. (Bacc Core Course)
Attributes: CSST – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WS 360, WS 360A, WS 360H

WGSS 364H. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as GS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WS 364, WS 364H, WGSS 364

WGSS 399H. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics in women, gender, and sexuality. May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: WS 399, WS 399H, WS 399H
This course is repeatable for 12 credits.

WGSS 440H. *WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women’s use and control of natural resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: WS 440

WGSS 480H. *GENDER AND TRANSNATIONAL ACTIVISMS. (3 Credits)
Focuses on social constructions of gender in global context. It explores the comparative realities of various gendered struggles for social justice and studies key definitions and theoretical assumptions relevant to the subject of global feminist activism. (NC) (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; CSST – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACS – Liberal Arts Non-Western Core
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WS 224H with D- or better or WS 223H with D- or better or WS 224 with D- or better or WS 224H with D- or better
Equivalent to: WS 480H
WGSS 495H. *GLOBAL FEMINIST THEOLOGIES. (3 Credits)
Explores the connections between women's religious experiences around the world and the global problems addressed by feminist theology and spirituality. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WGSS 495, WS 495
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224 and junior standing

WGSS 496H. *FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: WGSS 495, WS 496, WS 496H
Recommended: (WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224) and junior standing

WLC 221H. *MASTERPIECES OF GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present. Class lectures discussing key works of German cinema will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films accompany the lectures. Taught in English. Film fee will be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: WLC 221

WLC 230H. *FRANCE TODAY: CULTURES WITHIN AND BEYOND ITS BORDERS. (3 Credits)
An exploratory study of French culture and society since 1945. Topics include: decolonization, immigration, Francophone intellectual currents, France's European vocation, and social conflict today. Conducted in English. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 230, FR 230H, WLC 230

WLC 231H. *GERMAN DICTATORSHIPS: NAZIS AND COMMUNISTS. (3 Credits)
Introduction to the two best-known dictatorships in German society, National Socialism of the Third Reich from 1933-1945 and Socialism in the German Democratic Republic from 1949-1989 via the study of visual experiences. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: GER 231H

WLC 261H. *MASTERPIECES GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present. Class lectures discussing key works of German cinema will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films accompany the lectures. Taught in English. Film fee will be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: GER 261, GER 261H, WLC 261

WLC 320H. *FRANCOPHONE CULTURES IN FILM. (3-9 Credits)
An exploration of the different cultures of France and the Francophone world through film. Students will delve into the heart of these societies and discover their socio-historical, political, economic and cultural context. Students’ analytical and critical skills will be thoroughly solicited through various research and writing activities. Taught in English. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 329, FR 329H, WLC 320
This course is repeatable for 9 credits.

WLC 429H. *FRENCH SOCIETY THROUGH ITS CINEMA. (3 Credits)
An examination of French society through its own cinema. Via the screening and study of films from the various periods of French history, students will delve into the heart of French society and will discover the socio-historical, political, economic and cultural context. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 429, FR 429H, WLC 429

WLC 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: WLC 499
This course is repeatable for 16 credits.

WR 121H. *ENGLISH COMPOSITION. (3 Credits)
Introduction to critical thinking, the writing process, and the forms of expository writing. Intensive writing practice, with an emphasis on revision. The term in which the student takes the course is determined alphabetically. (Bacc Core Course)
Attributes: CSW1 – Core, Skills, WR I; HNRS – Honors Course Designator
Equivalent to: WR 121

WR 224H. *INTRODUCTION TO FICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 221 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
Equivalent to: WR 224

WR 327H. *TECHNICAL WRITING. (3 Credits)
Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in scientific and technological fields. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator
Prerequisites: WR 121H with C- or better or Exam for Waiver - WR 121H with a score of 1
Equivalent to: WR 327

WR 362H. *SCIENCE WRITING. (3 Credits)
Students learn and practice the conventions for writing scientific material for a variety of audiences. Involves writing and research assignments, multimedia presentations, lecture, and in-class and online activities. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121H with a score of 1
Equivalent to: WR 362

WR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: WR 399
This course is repeatable for 16 credits.
WSE 470H. *FORESTS, WOOD, AND CIVILIZATION. (3 Credits)
Multidisciplinary examination of issues related to the roles of forests, trees, and wood in civilization, as providers of commodities, ecosystem services, and spiritual and artistic inspiration. Issues include global supply and demand, wood ownership and political power, and perceptions and uses of forest resources in different societies. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WSE 470

Honors Associate Undergraduate Major (HBA, HBFA, HBS)
Also available at OSU-Cascades.

The honors degree is jointly awarded by the Honors College and by the college of the student’s major. Therefore additional credit requirements beyond the total required by the colleges of the student’s major must be completed. HC students must satisfy all university and major requirements, as well as honors requirements. A student who completes a 15-credit track will be designated as an Honors Associate. Successful completion leads to receipt of an honors baccalaureate degree. Transcripts will also reflect Honors College completion and will denote HC course work. Interested students please contact the Honors College at 541-737-6400 or email honors.college@oregonstate.edu.

Major Code: 012
The requirements for the Honors Associate track include:

- Honors colloquia (minimum 6 credits)
- Honors electives (minimum 6 credits)
- Thesis/Research/Projects (minimum 3 credits)
- At least 12 honors credits must be upper division.
- Submitted thesis
- Total credits required for graduation is 180.

Major Code: 012

Honors Scholar Undergraduate Major (HBA, HBFA, HBS)
Also available at OSU-Cascades.

The honors degree is jointly awarded by the Honors College and by the college of the student’s major. Therefore additional credit requirements beyond the total required by the colleges of the student’s major must be completed. HC students must satisfy all university and major requirements, as well as honors requirements. A student who completes a 30-credit track of Honors College courses will be designated an Honors Scholar. Successful completion leads to receipt of an honors baccalaureate degree. Transcripts will also reflect Honors College completion and will denote HC course work. Interested students please contact the Honors College at 541-737-6400 or email honors.college@oregonstate.edu.

Major Code: 011
The requirements for the Honors Scholar track include:

- Honors baccalaureate core courses (minimum 6 credits)
- Honors colloquia (minimum 6 credits)
COURSE DESCRIPTIONS

Refer to the glossary below for how to read each course description. Additional enrollment information, such as registration restrictions, fees and class notes, are available in the Schedule of Classes (https://classes.oregonstate.edu/).

• Subject Code – An abbreviation used with a course number to indicate an academic subject area
• Course Number – Each course is assigned a course level. Courses numbered 100–499 are undergraduate courses (100–299 are lower division, 300–499 are upper division). Courses numbered 500 and above are graduate or professional/technical (500-699 are for masters or doctoral students and 700-899 are professional or technical courses for advanced degrees)
  • Some graduate level courses may be completed by senior undergraduates but interested students should consult their advisor or the department offering the course before enrolling
• Credits – The number of quarter credits awarded for successful completion of the course
• Description – A brief overview of the course content. If no description is listed, refer to the Schedule of Classes (https://classes.oregonstate.edu/) for details
• Attributes – Courses that meet a specific educational requirement
  • Baccalaureate Core Courses (BCC) and Writing Intensive Courses (WIC) are indicated by attributes beginning with ‘Core.’ Titles with an asterisk* are BCC courses and titles with a carat^ are WIC courses. All BCC and WIC courses are listed in the Baccalaureate Core (p. 1614) section of this Catalog
  • PAC courses always meet the lower-division Fitness Core requirement and are therefore not indicated with the BCC attribute or asterisk
  • Honors courses for students registered with the Honors College are indicated by the HNRS attribute
  • Courses that meet the College of Liberal Arts core requirement begin with the LA attribute
• Prerequisites – Courses or other educational requirements (eg. placement test) that must be completed prior to registering for another course or before proceeding to more advanced study. Concurrency will be indicated if you are allowed to enroll in the prerequisite at the same time. Minimum passing grade is indicated in brackets or parentheses
  • If you do not meet the prerequisites but you believe you have the necessary knowledge to be successful in the course, consult your advisor. The department has the final say on whether you are permitted to enroll in a course without the specific prerequisite
  • Some classes may be restricted by campus, degree, program or class standing, or require departmental approval. Registration restrictions are indicated in the Schedule of Classes (https://classes.oregonstate.edu/) not the Catalog
• Corequisites – Courses you must enroll in at the same time with another course
• Equivalency – A course that is equivalent to the selected course. Credit will only be awarded for one of these courses. Crosslisted courses are indicated with equivalency and in the course description as ‘CROSSLISTED’
• Repeatability – If the course can be taken multiple times for credit towards graduation, it will be indicated as “This course is repeatable for...credits”

• Recommended – Suggested background knowledge or college-level courses that you are encouraged to have completed prior to enrolling in the selected course. If you do not have the recommended background, consult your advisor or the course instructor regarding your suitability

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Academic Learning Services (ALS)

ALS 102. COLLEGE READING. (3 Credits)
Provides students with specific strategies for learning through reading. The primary focus of the course is to prepare students to function successfully in subsequent university course work. Emphasis is placed on the demonstration and practice of a study-reading process.
Equivalent to: ALS 102X

ALS 107. CAMP ORIENTATION. (1-3 Credits)
Assists students of migrant worker background to develop successful skills adaptive to the culture of higher education.
This course is repeatable for 9 credits.

ALS 108. ONLINE LEARNING SUCCESS. (2 Credits)
A comprehensive orientation for distance learners. The course will address topics such as success strategies for online learning, Ecampus resources, how to engage in the campus community, time management, OSU library resources, academic integrity and more. Graded P/N.

ALS 109. TRIO-SSS FIRST-YEAR STUDENT SUCCESS. (2 Credits)
For TRIO-SSS students. Designed to ease their transition to college by providing technological and academic skills, as well as knowledge of resources and the information necessary to be successful students and productive citizens. Students will also learn the importance of self-reliance and the skills necessary to be self-sufficient.

ALS 114. CAREER DECISION MAKING. (2 Credits)
Students will become knowledgeable about the world of work and career development theories using career assessment, literature, media, and computer resources. Lec/rec.

ALS 116. ACADEMIC SUCCESS. (2 Credits)
Assessment and development of strategies for succeeding in university-level academics. Topics include time management, goal setting, critical thinking, note taking, and study skills. Graded P/N.

ALS 140. INTRODUCTION TO UNIVERSITY READING AND WRITING. (3 Credits)
Students will strengthen their ability to comprehend and analyze a variety of texts. They will also improve the unity and coherence of their writing as well as develop techniques for writing in an academic setting. Students will focus on strategic reading and content analysis; comparing and contrasting ideas; considering different points of view; and linking cause and effect relationships. In addition, students will be introduced to concepts regarding academic accountability and using outside sources in their writing.
Corequisites: ALS 181
ALS 141. INTRODUCTION TO UNIVERSITY LISTENING AND SPEAKING. (3 Credits)
Students will improve their ability to understand main ideas, important details, and implied meanings of authentic academic speech. They will listen to audio and video lectures, participate in in-class discussions, improve their note-taking skills, and conduct basic research that they will present in formal and informal in-class presentations.
Corequisites: ALS 181

ALS 143. INTO OSU BUSINESS GRADUATE STUDENT SUCCESS. (2 Credits)
Successfully completing graduate level studies in the United State presents challenges to a student on many levels, including personal, social, academic and language skills. This course provides MBA Graduate Pathway students with cultural and business-specific support to supplement the Pathway program’s content and language-focused courses. In addition, it supports students in developing essential culturally specific soft skills while working towards progression from the Pathway to full MBA graduate admission. Graded P/N.

ALS 145. BUILDING STRATEGIES FOR GRADUATE SUCCESS. (2 Credits)
Successfully completing graduate level studies in the United State presents challenges to a student on many levels, including personal, social, academic and language skills. This course provides STEM field Graduate Pathway students with cultural and STEM-specific support to supplement the Pathway program’s content and language-focused courses. In addition, it supports students in developing essential culturally specific soft skills while working towards progression from the Pathway to full graduate admission in their respective graduate programs.

ALS 150. INTO OSU ACADEMIC READING AND WRITING 5. (3 Credits)
Designed to provide international and/or immigrant students substantive practice in reading and writing English at the advanced level. Students are expected to read, understand and discuss a variety of academic readings from the natural and physical sciences, the social sciences, the humanities and literature. Students will work on reading skills; vocabulary acquisition; library and research skills; paraphrasing and summarizing; and the organization, style and development of essays.

ALS 151. INTO OSU ACADEMIC LISTENING AND SPEAKING 5. (3 Credits)
Skill building to develop and improve comprehension and notetaking of lectures in an academic format. Students required to give individual and group presentations including informational, argumentative, and persuasive presentations. Instruction is given in cross-cultural communications styles, non-verbal communication, questioning techniques, and clarifying information.

ALS 161. INTO OSU ACADEMIC LISTENING AND SPEAKING 6. (3 Credits)
Skill building to develop and improve comprehension and notetaking of lectures in an academic format. Students required to give individual and group presentations. Instruction is given in cross-cultural communication styles, non-verbal communication, questioning techniques, and clarifying information.
Prerequisites: ALS 150 with D- or better and ALS 151 [D-] or (ALS 150 [D-] and ALS 151 [D-])

ALS 162. INTO OSU READING AND WRITING IN ACADEMIC CONTENT AREAS. (3 Credits)
 Provides advanced practice in reading and writing with academic texts and is designed to help students move into college work. Assignments include extensive information searches, writing bibliographies, critiques of articles/readings, practice with essay exams, and a short research paper.
Prerequisites: ALS 150 with D- or better and ALS 151 [D-] or (ALS 150 [D-] and ALS 151 [D-])

ALS 165. TECHNICAL COMMUNICATION FOR INTERNATIONAL GRADUATE STUDENTS. (3 Credits)
Helps students develop comprehension of university-level academic material, engage in classroom discussions, and make academic presentations. Comprehension topics include note-taking skills and understanding organizational structures and signals used by university academic lecturers and discussions in STEM-related fields. Presentation skill development activities prepare students for COMM 111 and COMM 218, focusing on incorporating outside research from library sources (such as academic journals, newspapers, magazines, and textbooks) and working together with other students. Emphasis on group participation, equal sharing of group projects, self-evaluation, and critiques of the presentation styles of peers and lecturer.

ALS 166. WRITING/RESEARCH METHODS FOR INTERNATIONAL GRADUATE STUDENTS. (3 Credits)
Emphasizes reading and writing skills required for graduate-level STEM majors at the university, focusing on a wide range of reading skills and strategies that include critically analyzing academic journal articles, synthesizing ideas, vocabulary expansion, and vocabulary acquisition skills. Reading and vocabulary study are centered on a range of STEM fields and student interests. Written work focuses on writing critical reactions to readings through synthesizing multiple sources and developing coherent arguments. Students develop skills of summarizing, paraphrasing, utilizing appropriate grammar, customizing their writing style to their audience, and increasing familiarization with library and online resources.

ALS 173. COMMUNICATION FOR INTERNATIONAL GRADUATE BUSINESS STUDENTS. (3 Credits)
Focuses on developing comprehension of graduate-level business material and the ability to critically think and engage in classroom discussions, as well as making academic presentations. Comprehension topics include note-taking skills, organizational structures, and interpersonal communication cues used by business professionals. Communication and presentation skill development prepare students for the demands of BA 512, which focuses on comprehending lectures and analyzing content. Focuses on group participation, equal sharing of group projects, self-evaluation, opinion giving, and presentation styles. Students also will work on incorporating outside research from library sources, such as academic journals, newspapers, magazines, and textbooks.

ALS 174. PROFESSIONAL WRITING FOR GRADUATE BUSINESS STUDENTS. (3 Credits)
Emphasizes development of reading, writing and critical thinking skills needed for progression into the MBA program. Written work focuses on writing critical reactions to readings, summarizing, paraphrasing and synthesizing information and increasing familiarization with library and online resources. Additionally, the course gives attention to a range of reading skills and strategies, including vocabulary expansion and vocabulary acquisition skills. Students will develop business vocabulary and knowledge of key business concepts by reading and analyzing real-world business case studies and writing case briefs.
ALS 176. PROFESSIONAL WRITING FOR INTERNATIONAL GRADUATE STUDENTS. (3 Credits)
Emphasizes reading, writing and critical thinking skills required for success in graduate STEM classes. Written work focuses on writing about in-class experiments that replicate real-world procedures in STEM fields. Develops summary skills, with an emphasis on technical report writing, and develops skills in writing about procedures and recommendations. Focuses on improving reading comprehension of authentic STEM texts found in reports, articles and published papers. Students will develop skills in using STEM-focused online databases. Finally, teamwork and revision are essential components of the course.

ALS 181. INTO OSU ESL BRIDGE. (2 Credits)
This course acts as a 'bridge' for international students enrolled in specific OSU courses. It supports the understanding of OSU course assignments and vocabulary, and helps to build language skills needed to fulfill assignments. Classroom activities include, but are not limited to, discussions, in-class exercises, vocabulary games and exercises, and work in Canvas. Graded P/N. This course is repeatable for 8 credits.

ALS 190. BEST ORIENTATION. (1-5 Credits)
Focuses on study skills, time management and college success strategies specifically targeted to improve the academic performance of first-year student athletes at Oregon State University. Covers study strategies, time management, note taking, test preparation, critical reading, OSU’s campus resources, and online learning platforms. Students practice these skills in an accompanying baccalaureate core class. Provides first-year student athletes with a summer introduction to college along with strategies for balancing athletics and academics at the Division I level.
This course is repeatable for 5 credits.

ALS 199. SPECIAL TOPICS. (0-3 Credits)
Equivalent to: ALS 199H
This course is repeatable for 9 credits.

ALS 199H. SPECIAL TOPICS. (0-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ALS 199
This course is repeatable for 9 credits.

ALS 210. HOW TO BE SUCCESSFUL IN YOUR INTERNSHIP SEARCH. (2 Credits)
Internship preparation course designed to provide students with the fundamental tools to find and secure an internship. Topics will include internship search strategies, resumes, cover letters, and interviewing. Guest speakers will provide additional insight into these topics from the perspective of employers and students with prior internship experience. Reflection on student’s interests, values, and goals will also be integrated into the course.

ALS 277. SUPPLEMENTAL INSTRUCTION (SI) PEDAGOGY. (2 Credits)
Develops and strengthens your knowledge of collaborative and active learning and prepares you for a position as an SI Leader. Focuses on learning theories which inform our work; effective pedagogy for planning and leading study tables; and strategies for developing professional relationships with faculty, students, and coworkers. Through a variety of exercises including reading, reflection, observation, activity design, and facilitation, you will develop skills needed to succeed as a peer educator. Graded P/N.

ALS 295. LAST YEAR EXPERIENCE. (2 Credits)
An introduction and analysis of post-college skill sets including the study of personal finance, career search techniques, communication skills, self-exploration and organizational integration.

ALS 298. AVOIDING PLAGIARISM. (2 Credits)
Intellectual property is highly valued in the US. Violating intellectual property rights is considered to be a significant offense, especially in higher education. Successful university students must learn intellectual property and scholarly communication conventions, including definitions of plagiarism, its significance, and ways to avoid it. To guide students in conducting scholarly conversations, this course addresses formal expectations of academic communication, including proper source integration in academic writing and community expectations and ethics surrounding attribution. Effective integration and attribution of sources empowers students to become responsible and successful participants and contributors in academic conversations.

ALS 299. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 9 credits.

Accounting (ACTG)

ACTG 317. EXTERNAL REPORTING I. (4 Credits)
Examines the theory and practice of financial accounting, the processing and controls phases of the accounting system, and reporting to external parties. Emphasis is placed on the accounting cycle and financial statement structure and content. The emphasis on the accounting cycle includes the processing and tracing of transaction data from source documents to financial statements.
Prerequisites: (BA 211 with C or better or BA 211H with C or better) and (BA 213 [C] or BA 213H [C])
Equivalent to: BA 317

ACTG 318. EXTERNAL REPORTING II. (4 Credits)
Continuation from ACTG 317 and the theory and practice of financial accounting and the reporting to external parties. Covers financial reporting objectives to provide information that is useful in investment and credit decisions, in assessing cash flow prospects, and about company resources and claims to those resources.
Prerequisites: ACTG 317 with C or better
Equivalent to: BA 318

ACTG 319. EXTERNAL REPORTING III. (4 Credits)
Continuation from ACTG 318 and the theory and practice of financial accounting and the reporting to external parties. Covers financial reporting objectives to provide information that is useful in investment and credit decisions, in assessing cash flow prospects, and about company resources and claims to those resources.
Prerequisites: ACTG 318 with C or better
Equivalent to: BA 319

ACTG 321. COST MANAGEMENT I. (4 Credits)
Reinforces and builds on the language and concepts of management accounting. Emphasizes different models for product costing and examines their effects on profit planning, budgeting, motivation, and control.
Prerequisites: ACTG 317 with C or better
Equivalent to: BA 321
ACTG 326. ACCOUNTING RESEARCH METHODS AND TOPICS. (2 Credits)
Covers the theory and practice of corporate financial reporting. It highlights the development of generally accepted accounting principles (GAAP) and accounting policy choices from two perspectives. First, it examines accounting policy making at the macro (standard setter) level, as well as to examine the past, present, and future role of standard setters in formulating accounting policy. Second, from the micro or company level, it will use cases involving decisions in financial reporting to evaluate accounting conventions, particularly with regard to how those decisions reflect economic reality and the quality of earnings. It will also conduct applied accounting research.
Prerequisites: (BA 211 with C or better or BA 211H with C or better) and (BA 213 [C] or BA 213H [C])

ACTG 378. ACCOUNTING INFORMATION MANAGEMENT. (4 Credits)
Introduces students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, the system life cycle model, systems analysis and design methodologies, and the development and implementation of information systems. Lec/rec.
Prerequisites: (BA 213 with C or better or BA 213H with C or better) and (BA 270 [C] or BA 270H [C] or BA 302 [C]) and (BA 275 [C] or BA 275H [C] or BA 276 [C])
Equivalent to: ACTG 378H, BA 378

ACTG 378H. ACCOUNTING INFORMATION MANAGEMENT. (4 Credits)
Introduces students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, the system life cycle model, systems analysis and design methodologies, and the development and implementation of information systems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 213 with C or better or BA 213H with C or better) and (BA 270 [C] or BA 270H [C] or BA 302 [C]) and (BA 275 [C] or BA 275H [C] or BA 276 [C])
Equivalent to: ACTG 378

ACTG 379. ACCOUNTING ANALYTICS. (4 Credits)
Covers the analysis of data as it pertains to accounting professionals. The focuses include analytic techniques for decision making and the examination of “big data” involving accounting information. Hands-on experiences will develop skills with select software tools used in data analytics for accounting professionals.
Prerequisites: ACTG 318 with C or better and (ACTG 378 [C] or ACTG 378H [C])

ACTG 405. READING & CONFERENCE. (1-6 Credits)
This course is repeatable for 12 credits.

ACTG 414. FORENSIC ACCOUNTING. (2 Credits)
Explores the forensic accountant’s role in today’s economy. Topics covered include fraud detection and fraud investigation techniques, valuation of closely held businesses, lost profits analyses, and various types of litigation support services. Fundamental legal concepts governing expert witness testimony are also examined, and students are required to quantify economic damages in cases.
Prerequisites: ACTG 319 with C or better

ACTG 415. GOVERNMENTAL AND NOT-FOR-PROFIT. (2 Credits)
Introduction to accounting and financial reporting for governmental and not-for-profit organizations. Topics include state, local and federal governmental accounting, including fund accounting and reporting, and accounting for not-for-profit hospitals, universities, and health/welfare organizations.
Prerequisites: ACTG 319 with C or better

ACTG 416. ACCOUNTING RESEARCH AND ANALYSIS. (2 Credits)
Covers the theory and practice of corporate financial reporting. It highlights the development of generally accepted accounting principles (GAAP) and accounting policy choices from two perspectives. First, it examines accounting policy making at the macro (standard setter) level as well as to examine the past, present, and future role of standard setters in formulating accounting policy. Second, from the micro or company level it will use cases involving decisions in financial reporting to evaluate accounting conventions, particularly with regard to how those decisions reflect economic reality and the quality of earnings. It will also conduct applied accounting research.
Prerequisites: ACTG 319 with C or better

ACTG 417. ADVANCED ACCOUNTING. (4 Credits)
An advanced course in financial accounting theory. Covers corporate combinations, consolidated financial statements, and government and not-for-profit accounting.
Prerequisites: ACTG 319 with C or better
Equivalent to: BA 417

ACTG 418. ACCOUNTING CODES OF PROFESSIONAL CONDUCT AND ETHICAL BEHAVIOR. (2 Credits)
Explores ethical reasoning, integrity, objectivity, independence and other core values as defined by the American Institute of Certified Public Accountants.
Prerequisites: ACTG 319 with C or better

ACTG 419. MULTINATIONAL ACCOUNTING AND ANALYSIS. (2 Credits)
Examines the managerial and financial accounting function from an international perspective. Focuses on the flow of information in multiple currencies and compliance with reporting requirements in the United States, Europe and Japan.
Prerequisites: ACTG 319 with C or better

ACTG 420. IT AUDITING. (4 Credits)
Explores key information systems issues such as planning, acquisition, delivery, and monitoring from a risk and control perspective. Students learn to use IT audit standards, guidelines, and frameworks and build data analysis tool skills.
Prerequisites: (ACTG 319 with C or better or BA 372 with C or better) and (ACTG 378 [C] or ACTG 378H [C])
Equivalent to: BA 420

ACTG 422. STRATEGIC COST MANAGEMENT. (4 Credits)
Continuation of concepts and processes of management accounting. Emphasizes relevant costs, cost accumulation and allocation, segment performance measurement and control and quantitative techniques.
Prerequisites: ACTG 319 with C or better and ACTG 321 [C] and BA 357 [C]
Equivalent to: BA 422
ACTG 424. TAXATION I. (4 Credits)
Covers concepts related to business taxation and focuses primarily on 1) basic income tax law as it relates to businesses, 2) the role of income taxes in decision making processes, and 3) basic income tax research. In addition, the course is intended to assist students in preparation to become a professional, and thus contains components designed to aid in the development of technical, analytical, problem-solving and communication skills.
Prerequisites: ACTG 319 with C or better
Equivalent to: ACTG 325

ACTG 425. ADVANCED TAXATION. (4 Credits)
Examination of the federal tax system as it applies to corporations, partnerships, and estates and trusts. Emphasis is placed on understanding tax planning for business owners and refining the ability to research tax issues.
Prerequisites: ACTG 325 with C or better or ACTG 424 with C or better
Equivalent to: BA 425

ACTG 427. ASSURANCE AND ATTESTATION SERVICES. (4 Credits)
Assertions of enterprises gain credibility when examined by an independent third party. Assurance and attestation provide credibility. Coverage includes ethics, risk, materiality, internal control, evidence and reporting.
Prerequisites: ACTG 319 with C or better
Equivalent to: BA 427

ACTG 428. ADVANCED AUDIT ANALYTICS. (4 Credits)
An advanced four-credit course covering audit theory, current audit practice and auditor professional skills. The equivalent of three credits (30 hours) relates to in-class activities, readings, presentations, research and group discussions of relevant advanced audit topics. The equivalent of one credit (10 hours) relates to understanding the use and future of data analytics in the audit profession. Theory, current audit practice and auditor professional skills.
Prerequisites: ACTG 427 with C or better

ACTG 429. TOPICS IN ACCOUNTING. (1-4 Credits)
Analysis of current topics in accounting. Topics will vary from term to term.
Equivalent to: BA 429

ACTG 516. ACCOUNTING RESEARCH AND ANALYSIS. (3 Credits)
Emphasis on financial accounting, tax and auditing research and analysis and communication of conclusions in the context of accounting case studies.

ACTG 517. ADVANCED ACCOUNTING. (4 Credits)
An advanced course in financial accounting theory. Corporate combinations, consolidated financial statements, foreign operations and subsidiaries, partnerships, and sole proprietorships; contemporary issues in financial accounting.
Equivalent to: BA 517
Recommended: ACTG 319

ACTG 518. ACCOUNTING THEORY AND PRACTICE I. (3 Credits)
Expands and integrates knowledge of US and international generally accepted accounting principles (GAAP) in a rigorous study of the design, selection, and consequences of various models of financial reporting.
Prerequisites: ACTG 516 with C or better and ACTG 517 [C]

ACTG 519. ACCOUNTING THEORY AND PRACTICE II. (3 Credits)
Study of the design, selection, and consequences of various models of financial reporting. Research accounting treatments for complex facts and circumstances with ambiguous accounting guidance. Build on financial reporting models to develop in-depth understanding and application of accounting practice.
Prerequisites: ACTG 518 with C or better

ACTG 520. IT AUDITING. (4 Credits)
Explores key information systems issues such as planning, acquisition, delivery, and monitoring from a risk and control perspective. Students learn to use IT audit standards, guidelines, and frameworks and build data analysis tool skills.
Recommended: (ACTG 319 or BA 372) and ACTG 378

ACTG 522. STRATEGIC COST MANAGEMENT. (4 Credits)
Continuation of concepts and processes of management accounting. Emphasizes relevant costs, cost accumulation and allocation, segment performance measurement and control and quantitative techniques.
Recommended: ACTG 319, ACTG 321 and BA 357

ACTG 524. INTRODUCTION TO TAXATION. (4 Credits)
Meets two major objectives. First, it is a technical introduction to U.S. income tax with emphasis on general and business related topics. Second, it provides a framework for students to launch further study in the tax area. Students will be encouraged to supplement text materials with readings from the Internal Revenue Code and Regulations as well as secondary tax research services.
Prerequisites: BA 528 with C or better

ACTG 525. ADVANCED TAXATION. (4 Credits)
Examination of the federal tax system as it applies to corporations, partnerships, and estates and trusts. Emphasis is placed on understanding tax planning for business owners and refining the ability to research tax issues.
Recommended: ACTG 424

ACTG 527. ASSURANCE AND ATTESTATION SERVICES. (4 Credits)
Assertions of enterprises gain credibility when examined by an independent third party. Assurance and attestation provide credibility. Coverage includes ethics, risk, materiality, internal control, evidence and reporting.
Equivalent to: BA 527
Recommended: ACTG 319

ACTG 529. TOPICS IN ACCOUNTING. (1-4 Credits)
Analysis of current topics in accounting. Topics will vary from term to term.
Equivalent to: BA 529

ACTG 620. FOUNDATIONS OF ACCOUNTING RESEARCH. (3 Credits)
Introduces first-year doctoral students to accounting research by discussing the development of modern accounting theory, relating it to theories in economics and finance, and exposing students to the different areas of and methodologies used in accounting research. Also begins a survey of classic and contemporary literature in the area of financial accounting research. Specific financial accounting topics may change from quarter to quarter, but sample topics include earnings management, earnings quality, and voluntary disclosure.
ACTG 621. FINANCIAL ACCOUNTING RESEARCH. (3 Credits)
Surveys classic and contemporary research in the area of financial accounting. Specific topics may change from quarter to quarter, but sample topics include the value relevance of accounting information, post earnings announcement drift, the residual income model, analysts’ use accounting information, and market-based assessments of the usefulness and limitations of alternative accounting measurements and disclosures.

ACTG 622. ACCOUNTING, JUDGMENT AND ACCOUNTABILITY. (3 Credits)
Surveys classic and contemporary research in areas related to management, judgment, and accountability in accounting. Specific topics may change from quarter to quarter, but sample topics include research on management incentives and compensation, performance measurement, auditing, corporate governance, and research using behavioral methods.

ACTG 623. TAX RESEARCH. (3 Credits)
Surveys classic and contemporary research in the area of taxation. Specific topics may change from quarter to quarter, but sample topics include tax vs. nontax costs in business decisions, book-tax differences, taxes and financial reporting, multijurisdictional tax issues, and tax avoidance.

Adult Ed & Higher Ed Leadership (AHE)

AHE 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AHE 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AHE 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AHE 401. RESEARCH. (1-16 Credits)
Equivalent to: ED 401
This course is repeatable for 16 credits.

AHE 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: ED 402
This course is repeatable for 16 credits.

AHE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSSA 405
This course is repeatable for 16 credits.

AHE 406. PROJECTS. (1-16 Credits)
Equivalent to: CSSA 406
This course is repeatable for 16 credits.

AHE 407. SEMINAR. (1-16 Credits)
Equivalent to: CSSA 407, UEXP 407
This course is repeatable for 16 credits.

AHE 408. WORKSHOP. (1-16 Credits)
Equivalent to: CSSA 408
This course is repeatable for 16 credits.

AHE 410. INTERNSHIP/WORK EXPERIENCE. (1-16 Credits)
Equivalent to: ED 410
This course is repeatable for 16 credits.

AHE 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ED 499
This course is repeatable for 16 credits.

AHE 501. RESEARCH. (1-16 Credits)
Equivalent to: CSSA 501, ED 501
This course is repeatable for 16 credits.

AHE 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: CSSA 502
This course is repeatable for 16 credits.

AHE 503. THESIS. (1-16 Credits)
Equivalent to: CSSA 503
This course is repeatable for 999 credits.

AHE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSSA 505
This course is repeatable for 16 credits.

AHE 506. PROJECTS. (1-16 Credits)
Equivalent to: CSSA 506
This course is repeatable for 16 credits.

AHE 507. SEMINAR. (1-5 Credits)
Equivalent to: CSSA 507
This course is repeatable for 16 credits.

AHE 508. WORKSHOP. (1-3 Credits)
Equivalent to: CSSA 508
This course is repeatable for 16 credits.

AHE 509. PRACTICUM. (1-16 Credits)
Equivalent to: ED 509
This course is repeatable for 16 credits.

AHE 510. INTERNSHIP. (1-18 Credits)
By special permission and arrangement.
Equivalent to: ED 510
This course is repeatable for 18 credits.

AHE 517. EDUCATION AND WORK. (3 Credits)
Issues related to work in the U.S. and other countries. The role of public, private, corporate, government, military and other education and training programs in meeting changing individual, corporate, and social work-related needs.
Equivalent to: ED 517

AHE 520. MULTICULTURAL ISSUES IN HIGHER EDUCATION. (3 Credits)
Developing understanding, knowledge, and skills of multiculturalism affecting the student affairs profession and careers in student affairs administration.
Equivalent to: CSSA 520

AHE 522. INSTRUCTIONAL TECHNOLOGY I. (1 Credit)
Explores technologies used in distance education to deliver content and facilitate active learning through learner creation of digital portfolios and artifacts using online tools and apps.

AHE 523. INSTRUCTIONAL TECHNOLOGY II. (1 Credit)
An overview of best practices in digital-age learning design, including implementation of backward design principles.
Prerequisites: AHE 522 with C or better

AHE 524. INSTRUCTIONAL TECHNOLOGY III. (1 Credit)
Students will develop the knowledge and skills needed to design and create complete online teachings/courses within a learning management system.
Prerequisites: (AHE 522 with C or better and AHE 523 [C])
AHE 525. INSTRUCTIONAL TECHNOLOGY IV. (1 Credit)
Learners will research and demonstrate how to use a current innovative instructional technology, as well as develop skills in understanding trends and preparing for future innovations in instructional technology.
**Prerequisites:** AHE 522 with C or better and AHE 523 [C] and AHE 524 [C]

AHE 531. INSTRUCTIONAL DESIGN. (4 Credits)
Designed for instructors, trainers, managers, organizational consultants or others who are responsible for the development of programs and courses in community colleges, the workplace or other settings. Using systems concepts and methods, students will learn to design learner-centered instructional programs and courses.
**Equivalent to:** ED 531

AHE 532. PROGRAM EVALUATION. (4 Credits)
Assessing outcomes in college curriculum and workplace training programs from a systems perspective and evaluation of program effectiveness. Particular emphasis on formative and summative evaluation, frameworks for program evaluation, quantitative and qualitative methods and analysis, communicating and reporting evaluation findings, and the ethics and standards of evaluation practice.
**Equivalent to:** ED 532

AHE 533. NEEDS ASSESSMENT AND RESEARCH. (4 Credits)
Introduces workplace learning needs assessment (WLNA) and research principles and practices for individual and collaborative learning groups.
**Prerequisites:** AHE 553 with C or better
**Equivalent to:** ED 533

AHE 534. ORGANIZATIONS AND SYSTEMS THEORY. (4 Credits)
Introduces principles and practices underlying individual and collaborative work group learning. Participants will learn how to create an environment that promotes effective and efficient workplace learning.

AHE 547. INSTRUCTIONAL STRATEGIES FOR ADULT LEARNERS. (4 Credits)
Exploration of and practice using instructional strategies to enhance adult learning. Acquisition of an instructional strategy tool kit as well as a method for evaluating adult learning events.
**Equivalent to:** ED 547
**This course is repeatable for 60 credits.**

AHE 549. ETHICAL AND PROFESSIONAL ISSUES. (4 Credits)
Focuses on issues facing professionals working with adult learners as well as ethical issues relevant to the practice and scholarship in the field. Combines instruction in inquiry-based teaching methods and learning theory with work in professional settings, such as for-profit and non-profit organizations and government agencies.

AHE 553. ADULT LEARNING & DEVELOPMENT. (4 Credits)
Introduce participants to key theories, orientations, models, and principles of learning and development in adulthood.
**Equivalent to:** ED 553

AHE 567. LEADERSHIP DEVELOPMENT AND HUMAN RELATIONS. (4 Credits)
Exploration of multiple theories of leadership in different organizational contexts; synthesize theory with experience to construct a personal framework for leadership practice.
**Equivalent to:** ED 567

AHE 575. EDUCATIONAL FINANCE. (3 Credits)
Finance, budgeting and accounting for sources of revenue; deferral, state and local financing, budgeting and accounting models, practical experience combined with examination of theory, trends and issues. Focus in either public schools, community colleges or higher education through practical experience.
**Equivalent to:** ED 575

AHE 582. LEGAL ISSUES IN HIGHER EDUCATION. (3 Credits)
A comprehensive presentation and discussion of the law governing administration within community colleges and college/universities with a special emphasis on student services administration.

AHE 599. SPECIAL TOPICS. (1-16 Credits)
**Equivalent to:** CSSA 599, ED 599
This course is repeatable for 16 credits.

AHE 601. RESEARCH. (1-16 Credits)
**Equivalent to:** ED 601
This course is repeatable for 16 credits.

AHE 602. INDEPENDENT STUDY. (1-16 Credits)
**Equivalent to:** ED 602
This course is repeatable for 16 credits.

AHE 603. THESIS. (1-16 Credits)
**Equivalent to:** ED 603
This course is repeatable for 999 credits.

AHE 605. READING AND CONFERENCE. (1-16 Credits)
**Equivalent to:** ED 605
This course is repeatable for 16 credits.

AHE 606. PROJECTS. (1-16 Credits)
**Equivalent to:** CSSA 606
This course is repeatable for 16 credits.

AHE 607. SEMINAR. (1-16 Credits)
**Equivalent to:** ED 607
This course is repeatable for 16 credits.

AHE 608. WORKSHOP. (1-16 Credits)
**Equivalent to:** ED 608
This course is repeatable for 16 credits.

AHE 609. PRACTICUM CLINICAL EXPERIENCE. (1-16 Credits)
**Equivalent to:** ED 609
This course is repeatable for 16 credits.

AHE 610. INTERNSHIP. (1-15 Credits)
**Equivalent to:** ED 610
This course is repeatable for 15 credits.

AHE 611. QUANTITATIVE ANALYSIS IN EDUCATIONAL RESEARCH I. (3 Credits)
Foundational course to methods and statistics used in quantitative educational research. Examines data analysis, statistical procedures, and interpretation of results within postsecondary environments.

AHE 612. RESEARCH PERSPECTIVES IN EDUCATION. (3 Credits)
Research perspectives, how they are influenced by worldviews, and how these worldviews influence research.
**Equivalent to:** ED 612
**Recommended:** AHE 562 and completion or concurrent enrollment in an introductory statistics course.
AHE 613. RESEARCH ANALYSIS AND INTERPRETATION IN EDUCATION. (3 Credits)
Critical analysis of scholarly studies in education from a variety of research perspectives.
Equivalent to: ED 613
Recommended: AHE 612 and completion or concurrent enrollment in an intermediate statistics course

AHE 614. ADVANCED RESEARCH METHODS IN EDUCATION. (1-3 Credits)
Selected topics in research methods as appropriate for research perspectives in education. May be repeated.
Equivalent to: ED 614
This course is repeatable for 6 credits.
Recommended: AHE 613

AHE 615. RESEARCH ISSUES. (3 Credits)
A core course in the College of Education’s doctoral program that focuses on research issues.
Prerequisites: (AHE 612 with C or better and AHE 613 [C] and AHE 614 [C])

AHE 616. QUANTITATIVE ANALYSIS IN EDUCATIONAL RESEARCH II. (3 Credits)
Develop conceptual and practical understanding of research and evaluation in higher education. Course topics include basic statistics, survey design, data analysis, and assessment issues. As an advanced statistics course, students will have the opportunity to apply concepts and gain direct research experience by conducting an original research project.
Prerequisites: AHE 611 with C or better

AHE 618. QUALITATIVE ANALYSIS IN EDUCATIONAL RESEARCH. (3 Credits)
Introduces learners to a variety of qualitative research perspectives and methodologies. Participants will examine these approaches by critiquing a scholarly article containing qualitative methods; formulating qualitative questions; writing a short proposal; collecting, coding, and analyzing data; and writing a final synthesis paper.

AHE 621. LEADERSHIP IN STUDENT SERVICES. (3 Credits)
Exploration of significant issues in design and delivery of student services in community college and higher education settings. Group discussion, model building, problem posing, issues analysis, and theory applications are employed. Students will reflect on current and future practices in student services, including emerging approaches to leadership.
Equivalent to: ED 621

AHE 638. HISTORY OF HIGHER EDUCATION. (3 Credits)
Surveys American higher education across 200-plus years of American history, with a specific emphasis in this section on the American community college.

AHE 640. HIGHER EDUCATION ADMINISTRATION. (3 Credits)
Current leadership and management theories and models, systems of organization, patterns of internal and external governance, and issues in institutional planning and advancement in higher education.
Equivalent to: ED 640

AHE 643. ORGANIZATION THEORY-HIGHER EDUCATION. (3 Credits)
An introduction to organizational theory (OT). The texts allow us to explore how systems thinking is applied to our world, and how we can use it to better understand the nature of human social engagement. Both OT and living systems theories are deeply associated with improvement and change theories in higher education settings and business.

AHE 645. ETHICAL PRACTICE. (3 Credits)
Reviews major ethical theories with an emphasis on practical applications related to community college professional practice.

AHE 653. INSTRUCTIONAL LEADER I. (3 Credits)
A core course in the College of Education’s doctoral program. Introduces major theories, theorists, and theoretical principles that will assist the learner in the understanding and development of systemic frameworks for instructional leadership.

AHE 672. RESEARCH PERSPECTIVES IN FOUR-YEAR HIGHER EDUCATION. (3 Credits)
An overview of the extensive research related to four-year colleges and universities, with an emphasis on the role of research in understanding and interpreting the nature of higher education. Explore research epistemologies, theories, and approaches related to social science and higher education, and how these ideas influence worldview and subsequent research. Identify a significant research topic/problem statement which will carry forward into the second year research courses in moving toward the dissertation topic for research related to four-year higher education.

AHE 673. RESEARCH INTERPRETATION IN FOUR-YEAR HIGHER EDUCATION. (3 Credits)
Critical analysis and interpretation of journal articles and scholarly research related to a problem statement in four-year higher education organization, learning, and/or leadership. Refinement of Sections 1 (Research Focus and Problem Statement) and II (Manuscript and Literature Review) of a Dissertation Proposal in four-year higher education.
Prerequisites: AHE 672 with C or better

AHE 674. ADVANCED RESEARCH METHODS IN FOUR-YEAR HIGHER EDUCATION. (3 Credits)
Identification and evaluation of an appropriate quantitative or qualitative study focused on four-year higher education. This includes a requirement that students demonstrate the ability to analyze and interpret data associated with their research question(s) as identified in their research proposal and that they outline the methodology that will be used to answer their research question(s)/proposal.
Prerequisites: AHE 673 with C or better

AHE 675. FOUR-YEAR HIGHER EDUCATION RESEARCH ISSUES. (3 Credits)
Finalize a dissertation proposal related to a research question on four-year education institutions that reflects research epistemologies, theories and approaches. Develop a dissertation draft for review by the student’s dissertation committee outlining: (a) Purpose of the student’s study and its significance within the context of research on four-year colleges and universities, (b) Review of related literature on the specific topic of the dissertation, and (c) Design of the dissertation study.
Prerequisites: AHE 674 with C or better

AHE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AHE 805. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: ED 805
This course is repeatable for 16 credits.

AHE 808. WORKSHOP. (1-4 Credits)
Equivalent to: ED 808
This course is repeatable for 16 credits.
Aeronautical & Astronaut. Eng. (AAE)

AAE 210. INTRODUCTION TO AEROSPACE ENGINEERING. (3 Credits)
Topics will include the engineering fundamentals of aeronautics and astronautics, including an introduction to aerodynamics, propulsion, structures, orbital mechanics and mission planning. Current industry practices in aerospace vehicle specifications, manufacturing, flight testing and certification will be presented.
Prerequisites: ENGR 211 with C or better

AAE 412. SPACE SYSTEMS ENGINEERING. (4 Credits)
Introduction to space systems engineering. Topics will include the fundamentals of astronautics, orbital mechanics and trajectory design, flight dynamics, guidance and navigation, stability and control of spacecraft. Rocket propulsion concepts, including chemical rockets (liquid, gas and solid propellants), hybrid rocket engines and modern advances in satellite power systems will be discussed. Current design practices in space systems engineering will be emphasized.
Prerequisites: (ME 317 with C or better or ME 317H with C or better) and (ME 373 [C] or ME 373H [C])

AAE 512. SPACE SYSTEMS ENGINEERING. (4 Credits)
Introduction to space systems engineering. Topics will include the fundamentals of astronautics, orbital mechanics and trajectory design, flight dynamics, guidance and navigation, stability and control of spacecraft. Rocket propulsion concepts, including chemical rockets (liquid, gas and solid propellants), hybrid rocket engines and modern advances in satellite power systems will be discussed. Current design practices in space systems engineering will be emphasized.
Recommended: (ME 373 or ME 373H) and (ME 317 or ME 317H)

Aerospace Studies (AS)

AS 111. FOUNDATIONS OF THE AIR FORCE PART I. (1 Credit)
The introduction to the Air Force mission and organization. Featured topics include Air Force dress and appearance stand standards; military customs and courtesies, Air Force heritage, overview of the Department of the Air Force, and Air Force core values. Basic oral and written communication will be assessed.

AS 112. FOUNDATIONS OF THE AIR FORCE PART II. (1 Credit)
Second part of the introduction to the Air Force mission and organization. Featured topics include Air Force career opportunities, Air Force benefits, military communication skills, Air Force installations, and look at the basic characteristics of war. Basic oral and written communication will be assessed.

AS 113. FOUNDATIONS OF THE AIR FORCE PART III. (1 Credit)
Third part of the introduction of what the Air Force is about and what the Air Force has to offer. Featured topics include basic leadership, team building, interpersonal skills, diversity in the Air Force, and the oath of office and commissioning. Basic oral and written communication will be assessed.

AS 120. LEADERSHIP LABORATORY. (1 Credit)
Cadets learn officership, leadership, drill and ceremony, and customs and courtesies. Lab. Graded P/N.
This course is repeatable for 3 credits.

AS 211. THE EVOLUTION OF AIR AND SPACE POWER 1860-1945. (1 Credit)
Study of the development of air power, concepts, and doctrine from its beginnings to the end of World War II. Historical examples examined include balloons, dirigibles, Wright Brother’s first flight, and the role of air power in World War I and II. Oral and written communication skills will be assessed.

AS 212. THE EVOLUTION OF AIR AND SPACE POWER 1945-1990. (1 Credit)
Study of the development of air power, concepts, and doctrine during the Cold War. Historical examples examined include the Berlin Airlift, nuclear deterrence, and the role of air power employment in the Korean and Vietnam conflicts. Oral and written communication skills will be assessed.

AS 213. THE EVOLUTION OF AIR AND SPACE POWER 1991-2025. (1 Credit)
Study of the factors contributing to the development of air power, concepts, and doctrine from the Persian Gulf War in 1990 to the present and beyond. Historical examples examined include the air campaigns used in the Gulf War, Kosovo crisis, Operations Enduring Freedom, Iraqi Freedom, and the Global War on Terrorism. Oral and written communication skills will be assessed.

AS 220. LEADERSHIP LABORATORY. (1 Credit)
Cadets are placed in element leadership positions in order to know and comprehend the Air Force concepts of command, discipline, tradition, and courtesies. Lab. Graded P/N.
This course is repeatable for 10 credits.

AS 299. SPECIAL TOPICS IN AIR FORCE STUDIES. (1-16 Credits)
Supervised individual work.
This course is repeatable for 99 credits.

AS 304. FIELD TRAINING. (6 Credits)
Four-week field training supplements campus courses in developing leadership and discipline. Mission, organization, and functions of an Air Force base; marksmanship, survival, and physical training; aircrew and aircraft indoctrination; orientation on specific opportunities in career fields. Conducted at an Air Force base. Graded P/N.

AS 311. LEADERSHIP FUNDAMENTALS, TEAM BUILDING AND PROBLEM SOLVING. (3 Credits)
Emphasis on leadership and management fundamentals, team building and problem solving. Case studies are used to examine leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. Unique exercises will be utilized to emphasize team building and problem solving. Oral and written communication skills will be assessed.

AS 312. EFFECTIVE SUPERVISION AND GROUP CONFLICT MANAGEMENT. (3 Credits)
Emphasis on situational leadership, group conflict management, effective supervision, professional knowledge, and communicative skills required of an Air Force officer. Unique case studies on leadership and management situations, and group conflict management will be utilized. Oral and written communication skills will be assessed.

AS 313. LEADERSHIP, ETHICS, AIR FORCE CORE VALUES AND ACCOUNTABILITY. (3 Credits)
Emphasis on leadership ethics, leadership core values, leadership accountability, and professional knowledge. Unique case studies on leadership ethics and accountability will be utilized. Oral and written communication skills will be assessed.
Agricultural Education (AED)

AED 235. INTRODUCTION TO AGRICULTURAL EDUCATION. (2 Credits)
Introduces students to the field of agricultural education. Explore the historical foundations and career pathways in non-formal and school-based agricultural education. Topics will include school-based agricultural education, non-formal and extension education, and agricultural literacy. Develop career skills and a plan to pursue a future career in agricultural education.

AED 313. THEORY AND PRACTICUM III: FIELD. (4 Credits)
Field based experience for students preparing to be agricultural teachers. Focus on teaching models.

AED 325. PLANNING AND DELIVERING NON-FORMAL AGRICULTURAL EDUCATION. (3 Credits)
This course uses adult learning theory and practice, including planning non-formal agricultural education programs for youth and adults, methods of instructional delivery, effective use of instructional technology, marketing agricultural education programs, and evaluation of agricultural education outcomes. Microteaching (practice teaching presentations) and group presentations required as part of laboratory assignments.

AED 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
AED 556. LINK RESEARCH, TEACHING, AND PRACTICE. (3 Credits)
Links research to teaching. Students will work with cooperating teachers to identify and apply research to teaching.

AED 557. ISSUES AND TRENDS IN CURRICULUM AND INSTRUCTION. (3 Credits)
Emphasizes trends related to subject matter curriculum issues unique to agricultural education at the secondary level.

AED 558. IMPROVING AGRICULTURAL SCIENCE AND TECHNOLOGY PROGRAMS. (3 Credits)
Provides impetus toward evaluation and improvement of local programs of agricultural science and technology (AST), such that they better reflect community, regional, and national needs.

AED 580. COMMUNICATING AGRICULTURAL AND LIFE SCIENCES TO THE PUBLIC. (3 Credits)
Focuses on communicating with the public about research-based science in agricultural and life sciences for the purposes of education, influencing public policy, promoting positive agricultural practices and creating change. Explores various communication outlets and media and how they are appropriate for different messages.

AED 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AED 603. DISSERTATION. (1-16 Credits)
Students engage in research and writing related to the completion of their dissertation to fulfill the requirements of the College of Education PhD program.

AED 640. INSTRUMENTATION AND DATA COLLECTION IN SOCIAL SCIENCE. (3 Credits)
Addresses the selection, development, and analysis of various types of quantitative instruments and procedures for collecting research data. The course has a quantitative focus and is oriented toward social science research. Lec/lab.

Recommended: SED 580 or equivalent introductory research methods course.

Agricultural Sci, College of (AGRI)

AGRI 199. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 8 credits.

AGRI 299. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agriculture and natural resources. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.

AGRI 399. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural science. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.

AGRI 402. INDEPENDENT STUDIES. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

AGRI 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

AGRI 411. *INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL. (3 Credits)
What is a food system, what does it look like, and how does it work? How do our food choices shape our world? Food systems, farm to plate, operate within social, political, economic, and natural environments, at multiple scales. This multidisciplinary course will introduce students to the complex topic of food systems, at different scales and from a variety of perspectives. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

AGRI 438. EXPLORING WORLD AGRICULTURE. (2 Credits)
Global practices of food production are highly diverse. However, there are also many common global issues related to agriculture, food, and natural resources. Speakers with international backgrounds and experiences will present material, as well as student teams who will research a topic of personal interest. In addition, opportunities for global study, internship, and research will be explored.
Equivalent to: AEC 438

AGRI 499. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agriculture and natural resources. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
This course is repeatable for 8 credits.

AGRI 506. ORGANIC AGRICULTURE CAPSTONE. (3 Credits)
Recommended: AGRI 520, CROP/SOIL 530, ANS 550

AGRI 511. INTRODUCTION TO FOOD SYSTEMS: LOCAL TO GLOBAL. (3 Credits)
What is a food system, what does it look like, and how does it work? How do our food choices shape our world? Food systems, farm to plate, operate within social, political, economic, and natural environments, at multiple scales. This multidisciplinary course will introduce students to the complex topic of food systems, at different scales and from a variety of perspectives.

AGRI 520. INTRODUCTION TO ORGANIC FOOD PRODUCTION. (3 Credits)
History of organic farming, advantages and disadvantages, review of long-term studies comparing organic and conventional production systems, a review of the federal organic production guidelines, methods and applications for organic production facilities, crop nutrition, compost and manure utilization, organic amendments, organic field crop production, organic gardening, organic livestock production, weed and pest control in organic systems, and marketing of organic produce.
Recommended: CROP 200 or SOIL 205 or BI 213 or introductory biology

AGRI 599. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural science. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
This course is repeatable for 8 credits.

Agriculture-General (AG)

AG 111. INFORMATION TECHNOLOGY IN AGRICULTURE. (3 Credits)
Using information technology in agriculture and agribusiness; practical experience with computer programs applicable to all agricultural disciplines.
Equivalent to: AREC 111

AG 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.
AG 200. ORIENTATION TO THE AGRICULTURAL SCIENCES MAJOR. (2 Credits)
Exploration of Agricultural Sciences major and career opportunities.
AG 211. SURVEY AND CONSTRUCTION. (3 Credits)
Land measurement and leveling as applied to agricultural uses.Concrete and agricultural building construction including the use of construction power tools, selection of materials and cost estimating.
AG 221. METALS AND WELDING. (3 Credits)
Practices of metal working including the use of metal working machines,metal identification, heat treating and metal properties. Fabrication of metals including arc and oxy-acetylene welding and cutting. Lec/lab.
AG 230. INTRODUCTION TO EXTENSION AND ENGAGEMENT. (3 Credits)
For students interested in pursuing a career with the OSU Extension Service. An introduction to the OSU Extension Service mission, philosophy, history, organization, structure, administration, program areas, Extension program development, Extension teaching and delivery methods, and the involvement and use of volunteers. This course is repeatable for 6 credits.
AG 301. *ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS. (3 Credits)
Designed and presented in partnership with Pacific Northwest Indians and Alaska Natives, focusing on natural ecosystems, differing views, power relationships, policymaking, and gender roles. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
AG 311. *NATIVE AMERICAN AGRICULTURE. (3 Credits)
Explores Native North American agriculture and land management–prehistory of important domesticates such as maize, historic change, and contemporary issues including modern stereotypes, women in agriculture, cultural survival, and both the physical and spiritual significance of these crops in Native American communities and around the globe past and present. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPDP – Core, Perspective, Difference/Power/Discrimination
AG 312. ENGINE THEORY AND OPERATION. (3 Credits)
Engine construction, operational theories and principles, lubrication, fuels and oils, emissions and preventive maintenance are taught through the process of small engine lab activities. Engine efficiency theories and measurement are presented.
AG 318. ACCESSING INFORMATION FOR AGRICULTURAL RESEARCH. (1 Credit)
Designed for students at a distance to develop library skills and improve access to information used to conduct technical agricultural research.
AG 351. *COMMUNICATING AGRICULTURE TO THE PUBLIC. (3 Credits)
Students will explore various outlets for communicating with the public about agriculture using appropriate, professional writing. Additionally, students will articulate their thoughts on controversial issues as well as write feature and editorial pieces promoting positive agricultural practices and people in agriculture. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CSGI – Core, Synth, Global Issues
AG 391. FARM IMPLEMENTS. (3 Credits)
Power farming implements including operation, maintenance, adjustments, calibration and use are covered. Field trips may be required.
AG 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
AG 402. INDEPENDENT STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.
AG 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.
AG 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
AG 406. SPECIAL PROBLEMS. (1-16 Credits)
This course is repeatable for 16 credits.
AG 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
AG 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.
AG 410. INTERNSHIP. (1-16 Credits)
A work internship to give students practical on-the-job preparation in any of the main facets of agriculture or related industries. This course is repeatable for 16 credits.
AG 412. AG SAFETY AND HEALTH. (3 Credits)
An examination of various hazards associated with agriculture. Control strategies will be explored and prevention methods identified. Hazards examined include machinery, livestock, controlled spaces, pesticides, and other items common to the agricultural workplace. Lec/lab.
AG 421. *WRITING IN AGRICULTURE. (3 Credits)
Students will synthesize their knowledge in various areas of agricultural sciences and analyze how current issues impact the agriculture industry, explore careers in agriculture, and develop their written communication skills. Students will share their ideas and demonstrate their learning primarily in writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
AG 425. DEVELOPMENTS IN AGRICULTURAL MECHANICS. (3 Credits)
Emphasis on the development of instructional units for agricultural instruction programs. Wide applications to agricultural mechanization and biotechnology. This course is repeatable for 9 credits.
AG 435. PROFESSIONAL PRESENTATIONS IN AGRICULTURE. (3 Credits)
Students will learn to effectively create and deliver professional presentations relevant to careers in agriculture and natural resources. This includes developing skills for both formal and informal presentations, using visual aids effectively, and using appropriate strategies to engage various audiences.
AG 445. *SOCIAL MEDIA ADVOCACY IN AGRI SCIENCES & NATURAL RESOURCES. (3 Credits)
Through practice and application, students develop the ability to communicate effectively in writing using social media and other digital platforms for business purposes, including internal communication, stakeholder engagement, educational messaging, event promotion, and product marketing.
Attributes: CSW2 – Core, Skills, WR II
AG 455. *RISK AND CRISIS COMMUNICATIONS IN AG SCI & NATURAL RESOURCES. (3 Credits)
Examine potential risk and crisis communications scenarios in agriculture, natural resources and environmental sciences, plus the relevant theories, models, and processes involved in addressing these types of situations effectively. Explores the mitigation, management, and response to risks and crises from a communications perspective with special application to natural resources, along with agricultural and environmental sciences, hazardous situations through completing case studies and creating a risk and crisis communications manual. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
AG 465. AG SCI AND NATURAL RESOURCES COMMUNICATIONS MINOR
CAPSTONE. (2 Credits)
Reflect on accumulated knowledge and technical/soft skills gained and conceptualize how to apply communication theories and practices in the context of future agricultural and natural resources careers. Integrate real-life agriculture and natural resources communications scenarios, which will allow for the practice of strategy development, proper implementation, and appropriate assessment methods. Helps package and demonstrate skills verbally and in a portfolio.
Prerequisites: AG 351 with D- or better

AG 492. TECHNOLOGY TRANSFER IN AGRICULTURE. (3 Credits)
Examination of processes by which formal and informal agricultural instruction programs influence the introduction and acceptance of technology in agriculture. An emphasis in the international arena will be maintained. The focus throughout the course will be on the role of a professional change agent working with technological change.

AG 499. SPECIAL TOPICS. (1-4 Credits)
Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
This course is repeatable for 12 credits.

AG 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

AG 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

AG 518. EXTENSION COURSE IN TEACHER EDUCATION: TECHNICAL.
(1-3 Credits)
Enables present and prospective teachers of agriculture to continue their professional development on technical topics of current importance.
Equivalent to: AED 518
This course is repeatable for 9 credits.

AG 521. WRITING IN AGRICULTURE. (3 Credits)
Students will synthesize their knowledge in various areas of agricultural sciences and analyze how current issues impact the agriculture industry, explore careers in agriculture, and develop their written communication skills. Students will share their ideas and demonstrate their learning primarily in writing.

AG 525. DEVELOPMENTS IN AGRICULTURAL MECHANICS. (3 Credits)
Emphasis on the development of instructional units for agricultural instruction programs. Wide applications to agricultural mechanization and biotechnology.
This course is repeatable for 45 credits.

AG 541. COMMUNITY PROGRAMS IN AGRICULTURE. (3 Credits)
Evaluating agricultural education program effectiveness and technical appropriateness. Development of long-range plans for agricultural programs to meet the technical needs of a community.

AG 592. TECHNOLOGY TRANSFER IN AGRICULTURE. (3 Credits)
Examination of processes by which formal and informal agricultural instruction programs influence the introduction and acceptance of technology in agriculture. An emphasis in the international arena will be maintained. The focus throughout the course will be on the role of a professional change agent working with technological change.

American Sign Language (ASL)

ASL 111. FIRST-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A beginning course to learn the basics of American Sign Language. The course focuses on the ASL language and its uses of syntax, grammar, vocabulary, facial expressions and deaf culture.

ASL 112. FIRST-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of ASL 111 with the development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 111, ASL 112, ASL 113.
Prerequisites: ASL 111 with D- or better
Recommended: Basic foundation of the language

ASL 113. FIRST-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of ASL 111 and ASL 112 with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 111, ASL 112, ASL 113.
Prerequisites: ASL 112 with D- or better

ASL 211. SECOND-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of the first-year ASL courses with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 211, ASL 212, ASL 213.
Prerequisites: ASL 113 with D- or better

ASL 212. SECOND-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of the second-year ASL series with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 211, ASL 212, ASL 213.
Prerequisites: ASL 211 with D- or better

ASL 213. SECOND-YEAR AMERICAN SIGN LANGUAGE. (4 Credits)
A continuation of the second-year ASL series with the further development of structures, receptive/expressive skills and vocabulary. Native and/or bilingual speakers of ASL will not receive credit for ASL 211, ASL 212, ASL 213.
Prerequisites: ASL 212 with D- or better

American Sign Language Program (AMS)

AMS 311. TOPICS IN AMERICAN STUDIES. (4 Credits)
Selected topics, changed annually, that investigate American ideas, regions, events, or periods. Fulfills the requirement for an integrated course in the major. May be repeated as topics vary. Open to nonmajors.
This course is repeatable for 99 credits.
AMS 350. AMERICAN CULTURE AND THE VIETNAM EXPERIENCE. (4 Credits)
Examines through literature, film, and popular media the effects of the Vietnam War on American culture. Taught at OSU-Cascades only. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: AMS 407/ENG 407. (Writing Intensive Course)

AMS 405. READING AND CONFERENCE. (1-16 Credits)
Independent, individual studies supervised by the director, members of the American Studies Board, or assigned professors, as arranged by the student and the director.
This course is repeatable for 16 credits.

AMS 406. PROJECTS. (1-16 Credits)
Studies of American culture and society centered around topical events or cultural programs of current interest in American studies.
This course is repeatable for 16 credits.

AMS 407. SEMINAR. (1-16 Credits)
CROSSTOOLISTED as AMS 407/ENG 407. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ENG 407
This course is repeatable for 16 credits.

AMS 410. AMERICAN STUDIES INTERNSHIP. (1-16 Credits)
Supervised and evaluated work in a variety of professional fields to enhance students' career preparation; arranged at the initiative of the student one semester in advance.
This course is repeatable for 16 credits.

AMS 507. SEMINAR. (1-16 Credits)
CROSSTOOLISTED as AMS 507/ENG 507.
Equivalent to: ENG 507
This course is repeatable for 16 credits.

Animal Sciences (ANS)

ANS 100. ORIENTATION TO ANIMAL AND RANGELAND SCIENCES. (1 Credit)
Designed to provide incoming Animal and Rangeland Sciences students an introduction to college life at OSU with an emphasis on the faculty, facilities, services, and the curricula of the Department of Animal and Rangeland Sciences.

ANS 121. INTRODUCTION TO ANIMAL SCIENCES. (4 Credits)
Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: ANS 121H

ANS 121H. INTRODUCTION TO ANIMAL SCIENCES. (4 Credits)
Principles of breeding, physiology, nutrition, and management as they apply to modern livestock and poultry production. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: ANS 121

ANS 207. SOPHOMORE SEMINAR. (2 Credits)
Examination of career opportunities in animal sciences.

ANS 215. BEEF/DAIRY INDUSTRIES. (3 Credits)
Introduction to beef and dairy industries; history, current industry status, and demonstration and practice of basic husbandry skills.
Recommended: ANS 121

ANS 216. SMALL RUMINANT/SWINE INDUSTRIES. (3 Credits)
Introduction to the small ruminant and swine industries including history, current status and production practices, with demonstration and hands-on experience of basic husbandry practices.
Recommended: ANS 121

ANS 217. POULTRY INDUSTRIES. (3 Credits)
Familiarization of the organizational structure and marketing arrangement of poultry industries; hands-on managerial techniques, practices and procedures carried out by the poultry industries.

ANS 220. INTRODUCTORY HORSE SCIENCE. (3 Credits)
Introduction to horses, their history, breeds, form and function, performance evaluation, current industry status, and general management.
Recommended: ANS 121

ANS 223. EQUITINE MARKETING. (2 Credits)
Course covers practical concepts of equine marketing. Emphasis on market assessment, targeting buyers, marketing and advertising strategies, hands-on experience in product preparation and presentation, marketing legalities.
Recommended: ANS 121, ANS 220 and ANS 192

ANS 231. LIVESTOCK EVALUATION. (3 Credits)
Focuses on an individual animal's economic merit as compared to a sample group. Visual appraisal, performance data, and carcass merit are stressed. Includes the evaluation of both market and breeding animals.
The livestock species of concentration include beef cattle, swine, sheep, and meat goats. Lec/lab.
Recommended: ANS 121

ANS 251. PRINCIPLES OF ANIMAL FOODS TECHNOLOGY. (3 Credits)
Processing of meat, milk and eggs into human food products. Lec/lab.
Recommended: ANS 121

ANS 280. COMPANION ANIMAL MANAGEMENT. (4 Credits)
An introduction to the challenges, responsibilities, and benefits of interaction with selected companion animals. Topics covered will provide an overview of the human-animal bond, the position of companion animals in society, ethical issues of pet ownership and potential career opportunities. In addition, the course will serve as an introduction to preventive care and normal behavior of dogs, cats, and selected exotic pets. As the Department of Animal and Rangeland Sciences curriculum offers courses addressing equine care and husbandry, horses will not be discussed in this class.

ANS 302. COMMON DISEASES OF COMPANION ANIMALS. (4 Credits)
An introduction to common diseases of selected companion animals. Emphasis will be placed on identifying predisposing factors, clinical signs, common diagnostic procedures and potential implications for human health. A $10 course fee will be required. Lec/rec.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D] or BI 212H [D]) and (BI 213 [D] or BI 213H [D]) and CH 121 [D] and CH 122 [D] and CH 123 [D]
Recommended: ANS 280

ANS 311. PRINCIPLES OF ANIMAL NUTRITION. (3 Credits)
Classification, digestion, absorption, and metabolism of nutrients in animals; consequences of nutritional deficiencies and toxicities.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D] or BI 212H [D])
ANS 313. APPLIED ANIMAL NUTRITION: FEEDS AND RATION FORMULATION. (4 Credits)
Discusses topics relevant to feedstuff identification and nutrient analysis, feed processing and formulation of balanced animal diets based on nutrient requirements. Provides students hands-on experiences in identifying various feedstuffs and formulating rations based on the nutrient composition of those feedstuffs. Also offered at EOU and through Ecampus.
Recommended: MTH 111

ANS 314. ANIMAL PHYSIOLOGY. (4 Credits)
Biological basis of animal performance; describes how networks of cells act cooperatively to enable locomotion, provide a stable internal environment, allocate resources, remove metabolic end-products, and counteract microorganisms.
Recommended: General principles of biology equivalent to BI 211, BI 212, BI 213 and junior standing or higher

ANS 315. CONTENTIOUS SOCIAL ISSUES IN ANIMAL AGRICULTURE. (3 Credits)
Discussion of contentious issues including role of animal products and human health; use of hormones and antibiotics; new animal biotechnologies; animal rights/welfare; livestock grazing on public lands. (Bacc Core Course).
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ANS 316. REPRODUCTION IN DOMESTIC ANIMALS. (4 Credits)
Anatomy and physiology of mammalian and avian reproductive systems; fertilization, embryonic and fetal development, placentaion and parturition; reproductive technologies. Lec/rec.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (CH 121 [D] or CH 221 [D-] or CH 231 [D-] or CH 231H [D-])
Recommended: ANS 121

ANS 317. REPRODUCTION IN DOMESTIC ANIMALS LABORATORY. (1 Credit)
Gross and microscopic anatomy of the reproductive tract; semen collection, evaluation and extension; evaluation of fertility, embryo and fetal development and placentaion. Lec/lab.
Prerequisites: ANS 316 (may be taken concurrently) with D- or better

ANS 320. PRINCIPLES OF COMPANION ANIMAL NUTRITION. (3 Credits)
Learn about nutrients, the digestive process, and the application of nutritional sciences to the health and welfare of companion animals. Introduction to the metabolic basis and practical preventative management for nutritional diseases in companion animals.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D] or BI 212H [D])

ANS 321. AVIAN EMBRYO. (4 Credits)
Discussion and experimentation involving the development and the environmental requirements for the artificial incubation of avian embryos. Lec/lab. Offered even-numbered years.
Recommended: ANS 121 and ANS 217 and BI 211

ANS 331. ADVANCED LIVESTOCK EVALUATION. (4 Credits)
Aspects of an individual animal's economic merit are compared to a sample group. Emphasis is placed on beef, swine and sheep. Visual appraisal, performance data and carcass merit are stressed. Designed to prepare students for the intercollegiate livestock judging team.
This course is repeatable for 12 credits.
Recommended: ANS 231

ANS 333. EQUINE STABLE MANAGEMENT. (3 Credits)
Discusses developing a business plan, financial statements, and ratios, budgeting, financial planning, taxation, and employment issues within the current equine industry.
Prerequisites: ANS 220 with D- or better
Recommended: ANS 222

ANS 335. EQUINE HEALTH AND DISEASE. (3 Credits)
Recognition of common diseases and disorders including their cause, treatment and prevention. Management of internal and external parasites. Recognizing common lameness issues.

ANS 341. ANIMAL BEHAVIOR AND COGNITION. (3 Credits)
Survey, discuss, and explore principles of animal behavior and cognition from a comparative perspective, taking into account the interacting influences of biology, environment, and life experience on the individual and group behavior of animals across species. Aspects of animal cognition, including reasoning, perception, memory and personality, that play an important role in animal behavior will also be addressed.
Prerequisites: BI 102 with D or better or BI 213 with D or better

ANS 351. ADVANCED PRINCIPLES OF ANIMAL FOODS TECHNOLOGY. (4 Credits)
Provides in-depth coverage of both fresh and processed meats and eggs into products suitable for human consumption.
Recommended: ANS 251

ANS 378. ANIMAL GENETICS. (4 Credits)
Fundamentals of inheritance, principles of genetic segregation, population and quantitative genetics, response to natural selection and artificial manipulation of populations.
Prerequisites: BI 211 with D- or better or BI 212 with D- or better or BI 213 with D- or better
Recommended: ANS 121 and ST 351

ANS 380. PRINCIPLES OF ANIMAL ANATOMY AND PHYSIOLOGY. (3 Credits)
An introductory course in animal anatomy to provide a foundation for advanced courses in the Animal Science curriculum. Emphasis is on acquisition of a basic knowledge of minute and gross anatomical structures, their operation, and integration. Begins with anatomical nomenclature such as body planes and directional terms then covers the following tissues and organ systems: epithelium, connective tissue, blood and bone marrow, bone/cartilage, muscle tissue, nervous tissue, digestive system, circulatory system, reproductive system, urinary system, and respiratory system.
Prerequisites: (BI 211 with D or better or BI 211H with D or better) and (BI 212 [D] or BI 212H [D]) and (BI 213 [D] or BI 213H [D])

ANS 385. FOUNDATIONS OF MAMMALIAN HISTOLOGY. (3 Credits)
Provides a basic knowledge of mammalian microscopic anatomy. Emphasis will be on the appearance, organization and function of minute anatomical structures that can only be observed with the help of a visual enhancer, such as a microscope. Covers basic histological techniques and histology and related functions of the following tissues and organ systems: epithelium, connective tissue, bone/cartilage, blood, muscle tissue, nervous tissue, circulatory system, digestive system, reproductive system, urinary system, respiratory system, immune system, integument, eye and ear. Also covers gametogenesis, fertilization, and early development of the vertebrate embryo. Lec/rec.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (BI 314 [C-] or BI 314H [C-])
ANS 390. GROSS ANATOMY OF DOMESTIC ANIMALS. (4 Credits) Provides a foundation for advanced courses in the Animal Sciences curriculum. Emphasis on gaining knowledge of mammalian anatomy. Lectures cover anatomical nomenclature, structure, function, and integration of major organ systems. The dog is used as the general model while comparative domestic animal anatomy is also covered. Lec/lab. 
**Prerequisites:** (BI 211 with D or better or BI 211H with D or better) and (BI 212 [D] or BI 212H [D]) and (BI 213 [D] or BI 213H [D])

ANS 401. RESEARCH. (1-16 Credits) Graded P/N. *This course is repeatable for 16 credits.*

ANS 403. THESIS. (1-16 Credits) Graded P/N. *This course is repeatable for 16 credits.*

ANS 405. READING AND CONFERENCE. (1-16 Credits) Graded P/N. *This course is repeatable for 16 credits.*

ANS 410. ANIMAL SCIENCE INTERNSHIP. (1-12 Credits) On- or off-campus, occupational work experience supervised by the department. Graded P/N. *This course is repeatable for 16 credits.*

ANS 415. LIVESTOCK JUDGING TEAM. (3 Credits) Designed to train students for participation in the intercollegiate livestock judging team. *This course is repeatable for 9 credits.* Recommended: ANS 331

ANS 420. ETHICAL ISSUES IN ANIMAL AGRICULTURE. (3 Credits) Students are provided with an opportunity to discuss, debate and write extensively about current, relevant, and controversial social issues dealing with modern animal agriculture. (Writing Intensive Course) 
**Attributes:** CWIC – Core, Skills, WIC

ANS 427. APPLIED PHYSIOLOGY OF REPRODUCTION. (5 Credits) Principles, techniques, and recent development in semen collection, evaluation, extension and preservation; artificial insemination, estrus detection and synchronization; pregnancy diagnosis and embryo transfer. 
**Prerequisites:** ANS 316 with C or better and ANS 317 [C]

ANS 430. EGG PRODUCTION SYSTEMS. (3 Credits) Applications and analyses of egg production systems for brooding, rearing, and housing egg producing chickens. Decision case studies and practical management problems are incorporated into the course. Offered even-numbered years. Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378

ANS 431. EQUINE SYSTEMS II: NUTRITION. (3 Credits) Senior and graduate students explore the fundamentals of equine nutrition and their application in horse breeding. Includes practical training of laboratory techniques. Lec/lab. 
**Prerequisites:** ANS 220 with D- or better and ANS 316 [D-]

ANS 432. EQUINE SYSTEMS III: REPRODUCTION. (4 Credits) Senior and graduate students explore the fundamentals of equine reproduction and their application in horse breeding. Includes practical training of laboratory techniques. Lec/lab. 
**Prerequisites:** ANS 220 with D- or better and ANS 316 [D-]

ANS 433. POULTRY MEAT PRODUCTION SYSTEMS. (3 Credits) Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of poultry. (Including humans).

ANS 434. SHEEP PRODUCTION SYSTEMS. (3 Credits) Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool. 
**Recommended:** ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 435. APPLIED ANIMAL BEHAVIOR. (3 Credits) Development of understanding of animal behavior and implications for animal management, production, housing and welfare. Examples provided in class will cover a range of species, with emphasis on domestic animals. Lec/lab. 
**Recommended:** ANS 314 and BI 350 or Z 350

ANS 436. EGG PRODUCTION SYSTEMS. (3 Credits) Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle. 
**Recommended:** ANS 215 and ANS 313 and ANS 316 and ANS 378

ANS 437. BEEF PRODUCTION SYSTEMS: COW/CALF. (4 Credits) Exploration of the fundamental processes of animal behavior and implications for animal management, production, housing, and welfare. 
**Recommended:** ANS 435 or ANS 535 and (BI 350 or Z 350) and BI 213

ANS 441. TOPICS IN ANIMAL LEARNING. (3 Credits) Trends and how the behavior of animals can be shaped by the environment, individual experiences, and interactions with other animals (including humans). 
**Prerequisites:** BI 211 with D- or better and BI 212 [D-]

ANS 442. TOPICS IN ANIMAL LEARNING. (3 Credits) A continuation of the study of beef cattle management. Content will encompass the growth and development of weaned calves through slaughter for consumer beef production, with particular focus on the management of growing and yearling cattle in forage-based (stocker cattle) and drylot (feedlot) systems. Taught at EOU La Grande campus only. 
**Recommended:** ANS 121 and ANS 313 and (BA 321 or AEC 211)

ANS 443. BEEF PRODUCTION SYSTEMS: STOCKER/FEEDLOT. (4 Credits) A continuation of the study of beef cattle management. Content will encompass the growth and development of weaned calves through slaughter for consumer beef production, with particular focus on the management of growing and yearling cattle in forage-based (stocker cattle) and drylot (feedlot) systems. Taught at EOU La Grande campus only. 
**Recommended:** ANS 121 and ANS 313 and (BA 321 or AEC 211)
ANS 445. BEEF PRODUCTION SYSTEMS. (4 Credits)
Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of beef cattle from conception through calving, weaning, stocker/back grounding and the feedlot. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 313 and ANS 316 and ANS 317 and ANS 378

ANS 446. GRAZING LIVESTOCK PRODUCTION. (4 Credits)
Equips non-animal science majors with basic ruminant livestock (beef cattle, sheep and meat goat) production knowledge, so they may communicate and collaborate effectively with livestock producers.
Prerequisites: ANS 121 with D- or better

ANS 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: CROP 448, RNG 448

ANS 452. LIVESTOCK HOUSING AND WASTE MANAGEMENT. (3 Credits)
Basics in where, how, and why one would build, insulate, and ventilate livestock buildings. Manure and wastewater collection, treatment, storage, and utilization.

ANS 456. COMPANION ANIMAL PRODUCTION SYSTEMS. (3 Credits)
Fundamentals of dog and cat breeding stock selection, feeding and housing as well as biology and management from estrus through parturition to weaning. Due to the nature of this class, a variety of animals may be present during class session. Questions and interactions are encouraged but, while precautions are taken, any contact with animals carries some risk of injury or illness.
Prerequisites: (ANS 313 with D- or better and ANS 316 may be taken concurrently) [D-] and ANS 317 (may be taken concurrently) [D-] and ANS 378 [D-])

ANS 460. SWINE PRODUCTION SYSTEMS. (4 Credits)
Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of swine from conception through farrowing, weaning, and the growing/finishing phases. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 121 and ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

ANS 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 503. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

ANS 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ANS 507. GRADUATE SEMINAR. (1 Credit)
Section 1: Seminar/general for all graduate students. Preparation of effective visual aids. Practice explaining the validity or significance of experimental results to an informed audience. Section 2: Seminar/endocrinology, for graduate students interested in physiology.
This course is repeatable for 99 credits.

ANS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ANS 509. TEACHING PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ANS 511. DIGESTIVE PHYSIOLOGY AND NUTRITION OF RUMINANT ANIMALS. (4 Credits)
Anatomy and physiology of the ruminant digestive tract including rumen microbiology and digestive processes. Nutritional biochemistry and physiology of ruminants. Feed chemistry, feed intake and principles of ration balancing. Theory of energy and protein metabolism.
Recommended: ANS 311 or ANS 313

ANS 512. MONOGASTRIC AND POULTRY NUTRITION. (3 Credits)
Anatomical differences in digestive tracts of monogastrics; nutritional biochemistry of poultry; practical feeding of avian species; least-cost ration techniques; techniques for determining nutrient needs of monogastrics.
Recommended: ANS 311 and ANS 313

ANS 515. REVIEW OF APPLIED RUMINANT NUTRITION RESEARCH TECHNIQUES. (3 Credits)
Review and discussion and applied techniques and methodology used for ruminant nutrition research.

ANS 530. EQUINE SYSTEMS I: EXERCISE SCIENCE. (4 Credits)
Senior and graduate students intensively explore and apply science to real-life situations regarding cardiorespiratory, muscle physiology, and bone physiology responses to exercise, climate, and altitude. Lec/lab.
Recommended: ANS 314

ANS 531. EQUINE SYSTEMS II: NUTRITION. (3 Credits)
Senior and graduate students intensively explore and apply science to real-life situations regarding starch, fiber, protein, and fat metabolism in performance horses, breeding stock, and growing horses.
Recommended: ANS 313

ANS 532. EQUINE SYSTEMS III: REPRODUCTION. (4 Credits)
Designed for seniors and graduate students to explore the fundamentals of equine reproduction and their application in horse breeding. Includes practical training in laboratory techniques. Lec/lab.
Equivalent to: BI 532
Recommended: ANS 220 and ANS 316 and ANS 327

ANS 533. POULTRY MEAT PRODUCTION SYSTEMS. (3 Credits)
Fundamental applications and the analysis of management principles applied to brooding, rearing, feeding and housing meat-type chickens and turkeys and their respective breeders. Decision case studies and practical management problems are incorporated into the course. Offered odd number years.
Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378

ANS 534. EGG PRODUCTION SYSTEMS. (3 Credits)
Applications and analyses of egg production systems for brooding, rearing, feeding and housing egg producing chickens. Decision case studies and practical management problems are incorporated into the course. Offered even-numbered years.
Recommended: ANS 217 and ANS 313 and ANS 316 and ANS 378
AN 535. APPLIED ANIMAL BEHAVIOR. (3 Credits)
Exploration of the fundamental processes of animal behavior and implications for animal management, production, housing and welfare. Examples provided in class will cover a range of species, with emphasis on domestic animals. Lec/lab.
Recommended: ANS 314 and BI 350 or Z 350

AN 536. SHEEP PRODUCTION SYSTEMS. (3 Credits)
Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool.
Recommended: ANS 216 and ANS 311 and ANS 316 and ANS 378

AN 538. BIOLOGY OF LACTATION. (3 Credits)
Physiological and environmental factors affecting mammary gland development and function. Offered alternate years.
Recommended: Z 431 or Z 531

AN 539. DAIRY PRODUCTION SYSTEMS. (4 Credits)
Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle.
Recommended: ANS 215 and ANS 313 and ANS 316 and ANS 378

AN 540. DAIRY PRODUCTION SYSTEMS. (3 Credits)
Decision case analysis or special topics in application of dairy management principles.
Recommended: ANS 439

AN 541. TOPICS IN ANIMAL LEARNING. (3 Credits)
Explore when and how the behavior of animals can be shaped by the environment, individual experiences, and interactions with other animals (including humans).
Recommended: BI 211 and BI 212 and BI 213 and (ANS 435 or ANS 535) and (BI 350 or Z 350)

AN 543. BEEF PRODUCTION SYSTEMS: COW/CALF. (3 Credits)
Fundamentals of nutrition, reproductive physiology and health programs and their applications in the care and management of beef cattle. Overnight field trip with extra fee charged. Lec/lab. Taught at EOU La Grande campus only.
Recommended: ANS 315 and ANS 313 and ANS 316 and ANS 378

AN 544. BEEF PRODUCTION SYSTEMS: STOCKER/FEEDLOT. (3 Credits)
Continuation of the study of beef cattle management. Students will practice decision-making processes using area beef cattle operations as case studies. Overnight field trip with extra fee charged. Taught at EOU La Grande campus only.
Recommended: ANS 443 or ANS 543

AN 545. BEEF PRODUCTION SYSTEMS. (4 Credits)
Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of beef cattle from conception through calving, weaning, stocker/back grounding and the feedlot. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 313 and ANS 316 and ANS 317 and ANS 378

AN 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSTLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: CROP 548, RING 548

AN 550. ORGANIC ANIMAL PRODUCTION SYSTEMS. (3 Credits)
Topics include the principles of livestock production, legislation, animal welfare, and marketing of organic production systems. Course emphasizes principles, concepts, and techniques of organic and sustainable production of animals.

AN 552. LIVESTOCK HOUSING AND WASTE MANAGEMENT. (3 Credits)
Basics in where, how, and why one would build, insulate, and ventilate livestock buildings. Manure and wastewater collection, treatment, storage, and utilization. Offered alternate years.

AN 556. COMPANION ANIMAL PRODUCTION SYSTEMS. (3 Credits)
Fundamentals of dog and cat breeding stock selection, feeding and housing as well as biology and management from estrus through parturition to weaning. Due to the nature of this class, a variety of animals may be present during class session. Questions and interactions are encouraged but, while precautions are taken, any contact with animals carries some risk of injury or illness.
Recommended: ANS 313 and ANS 378 and completion or concurrent enrollment in ANS 316 and ANS 317

AN 560. LIPID METABOLISM. (3 Credits)
Digestion, absorption and metabolism of lipids with emphasis on lipoprotein metabolism, regulation of lipid metabolism in various tissues and metabolism of eicosanoids. Offered alternate years.
Equivalent to: NUTR 560
Recommended: BB 452 and BB 492

AN 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

AN 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

AN 603. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

AN 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

AN 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

AN 607. GRADUATE SEMINAR. (1 Credit)
This course is repeatable for 99 credits.

AN 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

AN 609. TEACHING PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

AN 662. HORMONE ACTION. (3 Credits)
Mechanisms of action of peptide and steroid hormones and related compounds at the cellular level. Offered every other year, winter term. CROSSTLISTED as ANS 662/MCB 662.
Prerequisites: BB 551 with C or better or BB 592 with C or better
Equivalent to: PHAR 662
**Anthropology (ANTH)**

**ANTH 101. *INTRODUCTION TO ANTHROPOLOGY. (3 Credits)**

Located at the intersection of the humanities and the sciences, anthropology strives for a holistic understanding of the human condition. This course introduces students to the basic concepts, theories and methods of anthropology, including its four main sub-fields: archaeology, biological anthropology, cultural anthropology, and linguistic anthropology. The course is driven by fundamental questions, including: What is culture? How do anthropologists study human populations, both past and present? How can this field help us better understand contemporary human problems? (Bacc Core Course)

**Attributes:**
- CPSI – Core, Pers, Soc Proc & Inst
- LACS – Liberal Arts Social Core

**ANTH 110. *INTRODUCTION TO CULTURAL ANTHROPOLOGY. (3 Credits)**

Investigates cultural adaptation and change in different environmental and historical contexts. Compares the means by which cultures solve common human problems. Shows similarities and differences throughout the world in systems of values, family, religion, economics, and politics. Students are asked to consider future cultural conditions. Uses a video format. (SS) (Bacc Core Course)

**Attributes:**
- CPSI – Core, Pers, Soc Proc & Inst
- LACS – Liberal Arts Social Core

**ANTH 159. *LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION. (4 Credits)**

Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed notions. CROSSLISTED as ANTH 159/ES 159/WLC 159. (Bacc Core Course)

**Attributes:**
- CPDP – Core, Perspective, Difference/Power/Discrimination
- Equivalent to: ES 159, WLC 159

**ANTH 199. SPECIAL STUDIES. (1-3 Credits)**

**Equivalent to:** ANTH 199H

*This course is repeatable for 3 credits.*

**ANTH 208. *WESTERN CULTURE STUDY ABROAD. (3 Credits)**

Overseas study of the history and contemporary form of important features of Western culture. Based on at least 10 weeks of studying abroad. CROSSLISTED as ANTH 208/LING 208. (Bacc Core Course)

**Attributes:**
- CPWC – Core, Pers, West Culture
- Equivalent to: LING 208

**ANTH 209. *CULTURAL DIVERSITY STUDY ABROAD. (3 Credits)**

Overseas study of non-Western cultures. Based on at least 10 weeks of studying abroad. CROSSLISTED as ANTH 209/LING 209. (Bacc Core Course)

**Attributes:**
- CPCD – Core, Pers, Cult Diversity
- Equivalent to: LING 209

**ANTH 210. *COMPARATIVE CULTURES. (3 Credits)**

Compares the cultures originating in Asia, Africa, and precolonial Australia, Oceania, and North and South America. Introduces method and theory for comparative cultural analysis from historical, ethnographic, and indigenous viewpoints. Considers the contribution and influences of minority and ethnic groups on the mainstream culture in nation states. Summarizes the characteristics of cultures in the major world culture areas. (Bacc Core Course)

**Attributes:**
- CPCD – Core, Pers, Cult Diversity
- Equivalent to: ANTH 210H

**ANTH 230. TIME TRAVELERS. (3 Credits)**

Introduction to the historical developments of modern archaeology. The often romanticized public image of archaeology will be contrasted with scientific reality. The nature of archaeological data, modern field methods, analytical techniques, and theoretical background will be reviewed in order to illustrate how the unwritten record of human cultural behavior is deciphered. (SS)

**Attributes:**
- LACS – Liberal Arts Social Core

**ANTH 240. INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY. (3 Credits)**

An investigation of the origin of modern people (Homo sapiens) in a historical context; review of key discoveries and current research on the relationships between humans and other primates; exploration of contrasting views of humanity. (SS)

**Attributes:**
- LACS – Liberal Arts Social Core

**ANTH 251. *LANGUAGE IN THE USA. (3 Credits)**

Examines the linguistic aspects of ethnic, class, and gender differences in the United States of America, with a focus on language attitudes. Uses both oral and written materials and quantitative and qualitative approaches. (Bacc Core Course)

**Attributes:**
- CPDP – Core, Perspective, Difference/Power/Discrimination
- Equivalent to: ANTH 251H

**ANTH 251H. *LANGUAGE IN THE USA. (3 Credits)**

Examines the linguistic aspects of ethnic, class, and gender differences in the United States of America, with a focus on language attitudes. Uses both oral and written materials and quantitative and qualitative approaches. (Bacc Core Course)

**Attributes:**
- CPDP – Core, Perspective, Difference/Power/Discrimination;
- HNRS – Honors Course Designator
- Equivalent to: ANTH 251

**ANTH 261. *FOOD IN AMERICAN CULTURE. (3 Credits)**

Fosters understanding of the meanings of foods and foodways in American culture. Uses food as a lens to explore general topic areas such as work, family, ecology, and identity. Critically examines core issues that shape and have shaped American culture. CROSSLISTED as ANTH 261/FCSJ 261. (Bacc Core Course) (SS)

**Attributes:**
- CPWC – Core, Pers, West Culture;
- LACS – Liberal Arts Social Core
- Equivalent to: FCSJ 261

**ANTH 284. *PRIMATE ADAPTATION AND EVOLUTION. (4 Credits)**

Introduces students to our closest living relatives, the primates. Uses theories and concepts from evolutionary biology to explore the diverse anatomical and behavioral adaptations of different primate species. Also explores the relationships between anatomy, behavior, and ecology on the individual and community level. Provides an evolutionary and ecological framework with which to view primates (including humans) and all living organisms. (Bacc Core Course)

**Attributes:**
- CPBS – Core, Pers, Biological Science
ANTH 311. *PEOPLES OF THE WORLD-NORTH AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 311H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 311H. *PEOPLES WORLD-NORTH AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 311
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 312. *PEOPLES WORLD-EUROPE. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: ANTH 312H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 312H. *PEOPLES WORLD-EUROPE. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
Equivalent to: ANTH 312
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 313. *PEOPLES OF THE WORLD-LATIN AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 313H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 313H. *PEOPLES OF THE WORLD-LATIN AMERICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 313
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 314. *PEOPLES OF THE WORLD-MIDDLE EAST. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 314H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 314H. *PEOPLES OF THE WORLD-MIDDLE EAST. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertainting to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 314
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 315. *PEOPLES OF THE WORLD-AFRICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 315H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 315H. *PEOPLES OF THE WORLD-AFRICA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 315
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.
ANTH 316. *PEOPLES OF THE WORLD-SOUTH AND SOUTHEAST ASIA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 317. *PEOPLES OF THE WORLD-PACIFIC. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 318. *PEOPLES OF THE WORLD—CHINA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: ANTH 318H
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 318H. *PEOPLES OF THE WORLD—CHINA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Prerequisites: ANTH 110 with D- or better or ANTH 210 with D- or better
Equivalent to: ANTH 318
Recommended: Completion of social processes and institutions requirement

ANTH 319. *PEOPLES OF THE WORLD—JAPAN AND KOREA. (3 Credits)
Survey of peoples around the world. Early settlement, cultural history, ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Recommended: ANTH 110 or ANTH 210 or completion of social processes and institutions requirement.

ANTH 330. *EVOLUTION OF PEOPLE, TECHNOLOGY, AND SOCIETY. (3 Credits)
Overview of the evolution and prehistory of the human species, including the development and interaction of human biology, technology, and society. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACS – Liberal Arts Social Core
Equivalent to: ANTH 330H

ANTH 331. MESOAMERICAN PREHISTORY. (3 Credits)
Explores the archaeology and prehistory of Mesoamerica from Paleo-Indian times through the Olmec, Maya, Zapotec, and Aztec cultures to the Spanish Conquest. Themes include the transition to settled agriculture, emergence of social inequality and political authority, the role of the natural environment, and the rich cultural heritage of Mesoamerican civilizations.
Attributes: LACN – Liberal Arts Non-Western Core
Recommended: Understanding of the fundamentals of archaeology

ANTH 332. ARCHAEOLOGICAL INFERENCE. (4 Credits)
In this course on archaeological inference, or the thought process of forming our understanding about the past, we will take a guided tour of the main stages of archaeological research design and try our hand at making archaeological inferences. We begin by learning about the basic conceptual problems in the study of the past, then, we engage with the theories and models used to address them, and finally we apply this knowledge in hands-on analytical activities during the laboratory sessions with archaeological artifacts. Lec/lab.
Prerequisites: ANTH 230 with D- or better

ANTH 345. *BIOLOGICAL AND CULTURAL CONSTRUCTIONS OF RACE. (3 Credits)
The social, cultural, and historical context of human biological diversity in the United States. Students become acquainted with primary resources relating to biological diversity within the modern human species and will offer a critical perspective on racial/ethnic categorization of that diversity. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ANTH 345H
Recommended: Sophomore standing and completion of one anthropology course.

ANTH 350. LANGUAGE, CULTURE AND SOCIETY. (4 Credits)
An examination of the communicative functions of language and the role of language in the construction of social relations. Covers the origins, structure, and diversity of language. Explores the relationships between language and thought and the use of linguistic models in the study of culture. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: 3 credits of social science.

ANTH 352. *ANTHROPOLOGY, HEALTH, AND ENVIRONMENT. (3 Credits)
Major threats to human health are increasingly linked to global environmental changes. This course engages medical and environmental anthropology research to critically explore the values, meanings and ideologies associated with ecological and public health issues in given localities throughout the world. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
ANTH 361. *FOOD JUSTICE. (4 Credits)
Contemporary food systems are examined from a cultural and social justice perspective. The human right to food as recognized by the United Nations serves as the justice grounding point. Impediments to realizing the right to food will be examined in national and international contexts. CROSSTLISTED as ANTH 361/FCSJ 361. (Bacc Core Course) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Equivalent to: FCSJ 361

ANTH 370. *ANTHROPOLOGICAL THEORIES. (4 Credits)
Foundational theories, approaches, and concepts are explored and used as a means to understanding how anthropologists past and present use theory. Students compare and contrast prominent theories, analyze current events and situations, and write a major research paper using anthropological sources.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ANTH 110 with D- or better
Recommended: Completion of social processes and institutions requirement

ANTH 371. RESEARCH METHODS IN CULTURAL ANTHROPOLOGY. (4 Credits)
Designed for anthropology majors, this course involves students in learning about and practicing anthropological research methods. Students practice ethnographic fieldwork by conducting participant observation and interviews, writing fieldnotes, analyzing real-life material for cultural values and power differences, and writing up a research paper.
Prerequisites: ANTH 110 with D- or better

ANTH 372. *SOCIAL NETWORKS AND SOCIETY. (3 Credits)
Introduces the foundational theory and concepts of social network analysis (SNA) and explores practical applications of SNA in environmental science, public health, business, politics, education, and public life. Also explores how the Internet, social media, and other information and communication technologies are affecting social networks and culture in the 21st century. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ANTH 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSTLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ES 373, WGSS 373, WLC 373

ANTH 374. *ANTHROPOLOGY AND GLOBAL HEALTH. (3 Credits)
An overview of historical and contemporary issues in gender health with emphasis on politics, globalisation, and the complex outcomes of interventions in diverse cultural settings. Students will articulate a critical and evidence-based perspective on complex global health issues. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Equivalent to: ANTH 374H

ANTH 374H. *ANTHROPOLOGY AND GLOBAL HEALTH. (3 Credits)
An overview of historical and contemporary issues in gender health with emphasis on politics, globalisation, and the complex outcomes of interventions in diverse cultural settings. Students will articulate a critical and evidence-based perspective on complex global health issues. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: ANTH 374

ANTH 380. *CULTURES IN CONFLICT. (3 Credits)
Communication and commerce draw East and West, industrial and pre-industrial, state and stateless societies together. Beliefs and values clash and complement one another. Explores the processes of intercultural contact, cross-cultural interaction, and the consequences of global penetration of European-American culture. Evaluates theoretical explanations for cultural persistence and change. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Equivalent to: ANTH 380H
Recommended: ANTH 110 or completion of non-Western Cultures requirement

ANTH 380H. *CULTURES IN CONFLICT. (3 Credits)
Communication and commerce draw East and West, industrial and pre-industrial, state and stateless societies together. Beliefs and values clash and complement one another. Explores the processes of intercultural contact, cross-cultural interaction, and the consequences of global penetration of European-American culture. Evaluates theoretical explanations for cultural persistence and change. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: ANTH 380
Recommended: Completion of non-Western Cultures requirement

ANTH 383. *INTRODUCTION TO MEDICAL ANTHROPOLOGY. (3 Credits)
Examines human health and healing systems from evolutionary and cross-cultural perspectives. Using a case study approach, this class explores individual- and population-level experiences of illness and healing, while providing students with the tools to evaluate global disease patterns and international health promotion and education programs. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: ANTH 383H

ANTH 383H. *INTRODUCTION TO MEDICAL ANTHROPOLOGY. (3 Credits)
Examines human health and healing systems from evolutionary and cross-cultural perspectives. Using a case study approach, this class explores individual- and population-level experiences of illness and healing, while providing students with the tools to evaluate global disease patterns and international health promotion and education programs. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: ANTH 383

ANTH 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: ANTH 399H

ANTH 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 401. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 402. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 403. THESIS. (1-6 Credits)
This course is repeatable for 16 credits.
ANTH 405. READING AND CONFERENCE. (1-6 Credits)
Equivalent to: ANTH 405H
This course is repeatable for 16 credits.

ANTH 405H. READING AND CONFERENCE. (1-6 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ANTH 405
This course is repeatable for 16 credits.

ANTH 406. PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 407. SEMINAR. (1-3 Credits)
Equivalent to: ANTH 407H
This course is repeatable for 16 credits.

ANTH 407H. SEMINAR. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ANTH 407
This course is repeatable for 16 credits.

ANTH 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 410. INTERNSHIP. (1-16 Credits)
Opportunities for students at junior and first-term senior class levels to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members. This course is repeatable for 16 credits.
Recommended: 6 credits of anthropology.

ANTH 420. WORLD CULTURES--TOPICS. (4 Credits)
In-depth study of world cultures. Early settlement, cultural history, Ecological adaptations, population, family and gender roles, religious ideology, political and economic systems, modern social changes, and contemporary issues pertaining to indigenous peoples in culturally distinct regions of the world. Emphasis is placed on dispelling stereotypic images, both past and present. Includes three hours of lecture and one hour of seminar. Cannot be taken if student is taking or has completed the 300-level course in the same geographical area. Graded P/N.
Recommended: 9 credits of social science including 3 credits of Anthropology

ANTH 421. ANALYSIS OF LITHIC TECHNOLOGIES. (4 Credits)
Covers the principles, procedures, and purpose of archaeological lithic analysis and the anthropological interpretation of lithic technologies used by prehistoric hunter-gatherers.
Prerequisites: ANTH 230 with D- or better

ANTH 422. HISTORIC MATERIALS ANALYSIS. (3 Credits)
Introduction to the analytical and descriptive methods and techniques used by historical archeologists to study late 18th through 20th century machine and handmade objects.
Prerequisites: ANTH 230 with D- or better

ANTH 423. METHOD AND THEORY IN HISTORICAL ARCHAEOLOGY. (4 Credits)
Examines the origins and growth of historical archaeology in the Americas. Students will critically learn about the linkages with history and anthropology and explore the theoretical underpinnings of historical archaeology.

ANTH 424. SETTLEMENT ARCHAEOLOGY. (4 Credits)
Explores the evolution of the theoretical underpinnings and field methods of settlement archaeology as well as the refinement of the meaning of 'settlement archaeology' over time.

ANTH 425. CERAMIC ANALYSIS IN ARCHAEOLOGY. (4 Credits)
Provides fundamental practical skills and theoretical perspectives for the analysis and interpretation of archaeological ceramics. On the practical side, students will learn both basic and advanced techniques for describing and analyzing pottery assemblages encountered by field archaeologists. On the theoretical side, the course will explore the diversity of research questions in which pottery can play a critical role, as well as the various ways in which ceramic data can be interpreted. Lec/ lab.
Prerequisites: ANTH 230 with D- or better

ANTH 430. TOPICS IN ARCHAEOLOGY. (1-4 Credits)
Recent advances in archaeology and their application to special fields of study. Topics vary from term to term.
Prerequisites: ANTH 230 with D- or better or ANTH 330 with D- or better This course is repeatable for 99 credits.

ANTH 432. *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION. (4 Credits)
Reviews the development of culture in the Old and New Worlds with special emphasis placed on the when, where, and how of early domestication of plants and animals. Examines the process of urbanization. (Bacc Core Course
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: ANTH 432H
Recommended: 6 credits of anthropology.

ANTH 432H. *DOMESTICATION, URBANIZATION, AND THE RISE OF CIVILIZATION. (4 Credits)
Reviews the development of culture in the Old and New Worlds with special emphasis placed on the when, where, and how of early domestication of plants and animals. Examines the process of urbanization. (Bacc Core Course
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ANTH 432
Recommended: 6 credits of anthropology.

ANTH 433. FIRST AMERICANS, LAST FRONTIERS. (4 Credits)
The initial human occupation of the Western Hemisphere is explored with particular emphasis on northeast Siberian cultural progenitors, routes and timing of entry into the Americas, population dispersal theory, the paleoenvironmental record, and human cultural responses to the conditions of the last frontier prior to 8,000 years ago.
Attributes: LACN – Liberal Arts Non-Western Core
Recommended: 6 credits of anthropology.

ANTH 434. NORTH AMERICA AFTER THE ICE AGE. (4 Credits)
The development of regional hunting and gathering adaptive strategies in North America from 8000 B.C. to the historic period are examined against a backdrop of changing climate, natural disasters, population growth, and human invention.
Recommended: ANTH 433 or 6 credits of anthropology.

ANTH 435. CULTURAL RESOURCES: POLICY AND PROCEDURES. (4 Credits)
Description and analysis of requirements and demands of cultural resource management. Historical development of cultural resource laws and appropriate field techniques and strategies to implement legislation.
Prerequisites: ANTH 230 with D- or better
ANTH 436. NORTHWEST PREHISTORY. (4 Credits)
Materials and theories relating to prehistoric aboriginal cultures of the Northwest. Evaluation of different theories on the origins and adaptations of prehistoric populations to ecological zones within the Northwest; comparisons of the cultural development through prehistoric times of the Columbia Plateau, intermontane and coastal zones of Oregon, Washington, and British Columbia. Special emphasis on the theories of origin, subsequent development of prehistoric cultures in the Northwest, and the present circumstances of archaeology in the Northwest.
Recommended: 6 credits of anthropology.

ANTH 437. GEOARCHAEOLOGY. (4 Credits)
Provides an introduction to geoarchaeological concepts and methods. Emphasis will be placed on the use of geoscientific perspectives and datasets to solve archaeological problems.
Prerequisites: ANTH 230 with D- or better

ANTH 438. ARCHAEOLOGY FIELD SCHOOL. (10-12 Credits)
Practical skills, archaeological methods and techniques including use of equipment, site surveying and mapping techniques, site excavation strategies, record keeping, field cataloging, report writing, and field camp management.
Recommended: 6 credits of anthropology

ANTH 439. ARCHAEOLOGICAL PERSPECTIVES ON FORAGERS. (4 Credits)
Provides an in-depth review of the concepts and approaches employed to study cultural aspects of past foraging peoples using archaeological research methods and theoretical perspectives.

ANTH 440. TOPICS IN PHYSICAL ANTHROPOLOGY. (1-4 Credits)
Recent advances in physical anthropology and their applications to special fields of study. Topics vary from term to term.
Prerequisites: ANTH 240 with D- or better or ANTH 330 with D- or better
This course is repeatable for 16 credits.
Recommended: General biology

ANTH 441. HUMAN EVOLUTION. (4 Credits)
The evolutionary history of the primate order as it is represented by fossils of the Paleocene through the Holocene. Special attention given to development of the Hominoids in the Miocene, the Australopithecines in the Pliocene, and members of the genus Homo in the Pleistocene. Lec/ lab.
Prerequisites: (ANTH 110 with D- or better or ANTH 210 with D- or better) and ANTH 240 [D-]
Recommended: General biology

ANTH 442. HUMAN ADAPTABILITY. (4 Credits)
Prerequisites: ANTH 240 with D- or better
Recommended: ANTH 340 or general biology

ANTH 443. HUMAN OSTEOLOGY LAB. (4 Credits)
Identification and analysis of human skeletal materials in an archaeological context.
Prerequisites: ANTH 240 with D- or better

ANTH 444. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, palaeodiets, assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. Crosslisted as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Prerequisites: ANTH 240 with C or better or ANTH 330 with C or better
Equivalent to: FCSJ 444

ANTH 446. FORENSIC ANTHROPOLOGY. (4 Credits)
Concepts and practices in the use of anthropology in legal matters and police cases, especially involving identification of human remains.
Prerequisites: ANTH 443 with D- or better

ANTH 447. *ARCTIC PERSPECTIVES ON GLOBAL PROBLEMS. (4 Credits)
The Arctic is on the frontline of today’s most pressing global problems. This course uses Arctic perspectives to explore issues affecting us all: climate change, environmental conservation, traditional ecological knowledge, development, energy extraction, indigenous rights, and indigenous media. Using insights from Arctic perspectives, we will plot pathways toward potential solutions. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: ANTH 447H

ANTH 447H. *ARCTIC PERSPECTIVES ON GLOBAL PROBLEMS. (4 Credits)
The Arctic is on the frontline of today’s most pressing problems. This course uses Arctic perspectives to explore issues affecting us all: climate change, environmental conservation, traditional ecological knowledge, development, energy extraction, indigenous rights, and indigenous media. Using insights from Arctic perspectives, we will plot pathways toward potential solutions. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: ANTH 447

ANTH 448. EVOLUTIONARY MEDICINE. (4 Credits)
Evolutionary medicine is founded on the idea that many challenges to human health can be accounted for by discordances between contemporary environments and those under which humans evolved. This course examines ways anthropologists may help to reframe questions about diseases within long-term, evolutionary contexts.
Prerequisites: (ANTH 110 with D- or better or ANTH 210 with D- or better) and (ANTH 240 [D-] or ANTH 330 [D-])

ANTH 449. BIOCULTURAL PERSPECTIVES ON HUMAN REPRODUCTION. (4 Credits)
Examines human reproduction and sexuality from the perspective of the New Biocultural Synthesis, a theoretical approach in anthropology that examines the interface of evolved biological, sociocultural and political-economic factors that interact to produce complex human behaviors and biology. Topics are presented from a life-history perspective where questions related to human reproduction and evolutionary history are examined across the lifespan from mating and conception through elderhood and menopause. Lec/lab.
ANTH 450. TOPICS IN LINGUISTIC ANTHROPOLOGY. (1-4 Credits)
Recent advances in the study of culture and communication and their application to special fields of knowledge. Topics vary from term to term. 
This course is repeatable for 16 credits. 
Recommended: 3 credits of linguistic anthropology.

ANTH 452. FOLKLORE AND EXPRESSIVE CULTURE. (4 Credits)
The study of folklore/popular culture in its social and historical context. Examines content, structure, communicative potential, and performative aspects of various forms of oral and written expression. Includes familiarization with the analysis of myths, legends, tall tales, proverbs, riddles, and play languages. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Recommended: 3 credits of social science.

ANTH 453. COMMUNITY HEALTH FIELD SCHOOL. (3-12 Credits)
Meets the growing need for international experiences for students in medical anthropology; international public health; and women, gender and sexuality studies. The field school is offered over a three- to seven-week period during the summer term. In-country time is flexible and can be adjusted depending on program requirements and financial constraints. Provides an intensive cross-cultural field experience in San Juan, Puerto Rico, that is premised on a model of community-engaged, service learning and applied, emancipatory research. 
This course is repeatable for 12 credits.

ANTH 455. REPRODUCTIVE JUSTICE: A SERVICE LEARNING COURSE. (4 Credits)
Reproductive Justice is a service-learning course that aims to bridge theory and practice in reproductive health and social justice by developing connections between the university campus and members of the local community.

ANTH 459. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSTLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ES 459, WLC 459

ANTH 460. ETHNOGRAPHIC FIELD SCHOOL. (6 Credits)
Involves an intensive field experience, learning and developing practical skills for operating socially and culturally in another culture. Students engage in anthropological and mixed research topics, methods, and analysis, such as research ethics, research design, participant observation, ethnographic interviewing, community mapping, qualitative and quantitative data analysis.

ANTH 461. NEUROANTHROPOLOGY. (4 Credits)
The emerging interdisciplinary field of neuroanthropology combines anthropological understandings of human biological and cultural variation with recent findings in neuroscience. Key topics include socialization and enculturation, addiction, ritual, depression, and psychiatric disorders.
Prerequisites: ANTH 240 with C- or better or ANTH 345 with C- or better or ANTH 383 with C- or better

ANTH 465. POPULAR CULTURE: AN ANTHROPOLOGICAL PERSPECTIVE. (4 Credits)
Introduces some of the debates and issues swirling around analyses of late twentieth-, early twenty-first century popular/mass/public/mediated/commercial culture. Learning about its pervasive forms, its origins and effects, how we are situated in it, and how it situates us is vital to understanding the changes that characterize our postmodern world.

ANTH 470. TOPICS IN CULTURAL ANTHROPOLOGY. (1-16 Credits)
Covers recent advances in cultural anthropology and their applications to the field. Topics vary from term to term. 
Equivalent to: ANTH 470H
This course is repeatable for 16 credits. 
Recommended: 3 credits of social science.

ANTH 471. CASH, CLASS AND CULTURE: HUNTER-GATHERERS TO CAPITALISM. (4 Credits)
Students explore the cultural and social effects of capitalism in the contemporary world within the larger question of how economics and society intersect and change over time. Special emphases are put on food and work, but students explore the linkages of global forces and local life in a variety of ways.
Recommended: 3 credits of social science.

ANTH 472. CONTEMPORARY INDIAN ISSUES. (4 Credits)
Examines the background of Indian treaties and reservations with discussions of present issues such as health care, education, the Indian Child Welfare Act, fishing rights, and religious freedom. Issues are discussed in class with considerable class participation and some role playing.
Recommended: 3 credits of social science.

ANTH 473. *GENDER, ETHNICITY, AND CULTURE. (4 Credits)
Study of the practices and ideologies of gender as they intersect with those of ethnicity, race, class, and culture. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues 
Recommended: 3 credits of social science.
ANTH 474. CROSS-CULTURAL HEALTH AND HEALING. (4 Credits)
A comprehensive overview of current issues in global health with particular emphasis on social, cultural, and behavioral interventions. Explores issues of health and development in the international context, focusing on such issues as inequality, structural adjustment, economic development, and community-based approaches to health care, specific cultural beliefs and practices, and the influence of people's perceptions of health, illness, and healing.

ANTH 475. ANTHROPOLOGY IN PRACTICE. (4 Credits)
Capstone course for Anthropology majors. Discusses the use of anthropological skills and methods to solve real-world problems. Addresses professional opportunities for anthropologists; provides career development opportunities; and assesses learning outcomes for Anthropology majors.

ANTH 477. ECOLOGICAL ANTHROPOLOGY. (4 Credits)
Examines past and present interactions between humans and their environments. Emphasizes the concept of system and process of human adaptation.
Recommended: Upper-division standing and 3 credits of social science.

ANTH 478. *ANTHROPOLOGY OF TOURISM. (4 Credits)
Tourism is among the world's largest industries. The anthropology of tourism seeks to understand the relationships between the industry and the other cultural productions. Students explore the cultural practices and impacts of tourism in relation to both host and guest communities, and travel as cultural practice. Course is taught online and on Corvallis campus. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Recommended: 3 credits of social science

ANTH 479. ANTHROPOLOGY OF MIGRATION. (4 Credits)
Focuses on the multiple aspects of population movements around the globe. Investigates the history of recent human migration; current theories, trends and policies; as well as issues of immigrant incorporation and anti-immigrant politics.
Recommended: 3 credits of social science.

ANTH 480. TOPICS IN APPLIED ANTHROPOLOGY. (1-4 Credits)
Recent advances in applied anthropology and their application to special fields of study. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 481. *NATURAL RESOURCES AND COMMUNITY VALUES. (3 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: 3 credits of social science

ANTH 481H. *NATURAL RESOURCES AND COMMUNITY VALUES. (3 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Recommended: 3 credits of social science

ANTH 482. *ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT. (4 Credits)
Examines the ideological and theoretical bases of world assistance programs and their effects on different sectors and classes, including women. Causes of world hunger in terms of agronomic, mainstream economic and radical economic paradigms are developed and contrasted. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: AG 482

ANTH 483. ADVANCED MEDICAL ANTHROPOLOGY. (4 Credits)
An overview of anthropological studies of the health of human communities from a biological and behavioral perspective. Topics include prehistory of disease, cultural perspectives on causation of disease and approaches to healing; anthropological approach to international health issues; and case studies.
Prerequisites: (ANTH 110 with D- or better or ANTH 210 with D- or better) and (ANTH 240 [D-] or ANTH 330 [D-])

ANTH 484. *WEALTH AND POVERTY. (4 Credits)
Summarizes the distribution of wealth observed cross-culturally and through time. Determines the relation between wealth distribution and economic productivity. Shows the impact of industrialization and economic wealth distribution in Western civilization and cross-culturally. Evaluates how cultural practices affect wealth distribution in Western and non-Western societies. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: 3 credits of social science

ANTH 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D-] or ES 410 [D-] or WGSS 410 [D-] or WLC 410 [D-])
Equivalent to: ES 485, WGSS 485, WLC 485
This course is repeatable for 4 credits.

ANTH 486. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Attributes: LACS – Liberal Arts Social Core
Equivalent to: FCSJ 486
Recommended: 3 credits of social science.

ANTH 487. LANGUAGE IN GLOBAL CONTEXT. (4 Credits)
Deals with practical uses of linguistics in the global political arena. Explores use of official vs. unofficial languages, language standardization, the preservation of dying languages; problems in learning first and second languages, and the relevance of linguistic knowledge to education and cross-cultural communication.
Prerequisites: ANTH 251 with D- or better or ANTH 350 with D- or better
Recommended: Some knowledge of linguistic structure

ANTH 490. TOPICS IN METHODOLOGY. (1-4 Credits)
Recent advances in anthropological methodologies and their application to special fields of study. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 6 credits of anthropology
ANTH 492. ARCHAEOLOGICAL LABORATORY METHODS. (1-3 Credits)
Provides information on the basics of archaeological laboratory work. Students learn the day-to-day operations of a lab, how to classify and catalog artifacts, and how to do artifact analysis, research hypothesis.
Recommended: 6 credits of anthropology

ANTH 497. ARCHAEOLOGICAL FIELD METHODS. (1-3 Credits)
Archaeological field strategies emphasizing reconnaissance and survey. Application of field equipment and project management.

ANTH 498. ORAL NARRATIVE. (3 Credits)
Methodology course focused on the collection and processing of multiple speech genres, including personal narrative, oral history, folklore, and songs. Attention is given to ethics, legal issues, different forms of transcription, and the politics of representation.
Prerequisites: ANTH 350 with D- or better

ANTH 499. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
Equivalent to: ANTH 499H
This course is repeatable for 16 credits.

ANTH 499H. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
Attributes: HSRS – Honors Course Designator
Equivalent to: ANTH 499
This course is repeatable for 16 credits.

ANTH 501. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 503. THESIS. (1-12 Credits)
This course is repeatable for 999 credits.

ANTH 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 506. PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 507. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.

ANTH 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 510. GRADUATE INTERNSHIP. (1-16 Credits)
Opportunities for students at junior and first-term senior class levels to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members.
This course is repeatable for 16 credits.
 Recommended: 6 credits of anthropology.

ANTH 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student’s research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSLISTED as ANTH 515/ CSSA 515/ES 515/WGSS 515.
Equivalent to: CSSA 515, ES 515, WGSS 515

ANTH 519. BIOLOGIES OF POVERTY. (4 Credits)
A readings-based, discussion seminar on the applications of biological and biocultural anthropological theory to questions of embodiment and poverty. In it we will explore the ways key theoretical and methodological developments over the past two decades enable biocultural anthropologists to measure and explain the ways poverty and inequality become embedded beneath our skin—that is, the ways culture, belief, difference, power and discrimination are written on our bodies, and thus contribute to inequities in health outcomes across populations.
Recommended: A minimum of 6 credits of anthropology coursework

ANTH 521. ANALYSIS OF LITHIC TECHNOLOGIES. (4 Credits)
Covers the principles, procedures, and purpose of archaeological lithic analysis and the anthropological interpretation of lithic technologies used by prehistoric hunter-gatherers.
Recommended: ANTH 230

ANTH 522. HISTORIC MATERIALS ANALYSIS. (3 Credits)
Introduction to the analytical and descriptive methods and techniques used by historical archeologists to study late 18th through 20th century machine and handmade objects.
Recommended: ANTH 230

ANTH 523. METHOD AND THEORY IN HISTORICAL ARCHAEOLOGY. (4 Credits)
Examines the origins and growth of historical archaeology in the Americas. Students will critically learn about the linkages with history and anthropology and explore the theoretical underpinnings of historical archaeology.

ANTH 524. SETTLEMENT ARCHAEOLOGY. (4 Credits)
Explores the evolution of the theoretical underpinnings and field methods of settlement archaeology as well as the refinement of the meaning of ‘settlement archaeology’ over time.

ANTH 525. CERAMIC ANALYSIS IN ARCHAEOLOGY. (4 Credits)
Provides fundamental practical skills and theoretical perspectives for the analysis and interpretation of archaeological ceramics. On the practical side, students will learn both basic and advanced techniques for describing and analyzing pottery assemblages encountered by field archaeologists. On the theoretical side, the course will explore the diversity of research questions in which pottery can play a critical role, as well as the various ways in which ceramic data can be interpreted. Lec/lab.
Recommended: ANTH 230

ANTH 530. TOPICS IN ARCHAEOLOGY. (1-4 Credits)
Recent advances in archaeology and their application to special fields of study. Topics vary from term to term.
This course is repeatable for 16 credits.

ANTH 531. ARCHAEOLOGICAL THEORY. (4 Credits)
Historical development of archaeological field techniques and theoretical concepts with an emphasis on modern method and theory in North American archaeology.
Recommended: ANTH 230

ANTH 533. FIRST AMERICANS, LAST FRONTIERS. (4 Credits)
The initial human occupation of the Western Hemisphere is explored with particular emphasis on northeast Siberian cultural progenitors, routes and timing of entry into the Americas, population dispersal theory, the paleoenvironmental record, and human cultural responses to the conditions of the last frontier prior to 8,000 years ago.
Recommended: 6 credits of anthropology.
ANTH 534. NORTH AMERICA AFTER THE ICE AGE. (4 Credits)
The development of regional hunting and gathering adaptive strategies in
North America from 8000 B.C. to the historic period are examined against a
backdrop of changing climate, natural disasters, population growth, and
human invention.
Recommended: ANTH 433 or 6 credits of anthropology.

ANTH 535. CULTURAL RESOURCES: POLICY AND PROCEDURES. (4 Credits)
Description and analysis of requirements and demands of cultural
resource management. Historical development of cultural resource laws
and appropriate field techniques and strategies to implement legislation.
Recommended: ANTH 431

ANTH 536. NORTHWEST PREHISTORY. (4 Credits)
Materials and theories relating to prehistoric aboriginal cultures of the
Northwest. Evaluation of different theories on the origins and adaptations
of prehistoric populations to ecological zones within the Northwest;
comparisons of the cultural development through prehistoric times
of the Columbia Plateau, intermontane and coastal zones of Oregon,
Washington, and British Columbia. Special emphasis on the theories of
origin, subsequent development of prehistoric cultures in the Northwest,
and the present circumstances of archaeology in the Northwest.
Recommended: 6 credits of anthropology.

ANTH 537. GEOARCHAEOLOGY. (4 Credits)
Provides an introduction to geoarchaeological concepts and methods.
Emphasis will be placed on the use of geoscientific perspectives and
datasets to solve archaeological problems.
Recommended: ANTH 230

ANTH 538. ARCHAEOLOGY FIELD SCHOOL. (1-10 Credits)
Practical skills, archaeological methods and techniques including use
of equipment, site surveying and mapping techniques, site excavation
strategies, record keeping, field cataloging, report writing, and field camp
management.
Recommended: 6 credits of anthropology

ANTH 539. ARCHAEOLOGY OF FORAGERS. (4 Credits)
Provides an in-depth review of the concepts and approaches employed to
study cultural aspects of past foraging peoples using archaeological
research methods and theoretical perspectives.

ANTH 540. TOPICS IN PHYSICAL ANTHROPOLOGY. (1-4 Credits)
Recent advances in physical anthropology and their applications to
special fields of study. Topics vary from term to term.
This course is repeatable for 16 credits.
Recommended: ANTH 240 or ANTH 330 or general biology

ANTH 541. HUMAN EVOLUTION. (4 Credits)
The evolutionary history of the primate order as it is represented by
fossils of the Paleocene through the Holocene. Special attention given to
development of the Hominoids in the Miocene, the Australopithecines in
Washington, and British Columbia. Special emphasis on the theories of
origin, subsequent development of prehistoric cultures in the Northwest,
and the present circumstances of archaeology in the Northwest.
Recommended: 6 credits of anthropology.

ANTH 542. HUMAN ADAPTABILITY. (4 Credits)
Overview of human biology and its various sub fields, applications of
human biology in areas of nutrition, health, growth, adaptation, and
demography. Understanding adaptive variations among populations and
individuals in responses to environment, disease, and nutritional stress.
Recommended: ANTH 240 or ANTH 340 or general biology

ANTH 543. HUMAN OSTEOLOGY LAB. (4 Credits)
Identification and analysis of human skeletal materials in an
archaeological context.
Recommended: ANTH 240

ANTH 544. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative,
bicultural and evolutionary perspectives. Long-term evolutionary
processes are examined within an ecological framework as significant
factors affecting human biology and susceptibility to diet-related disease.
An emphasis on anthropological methods in nutritional assessment
including anthropometry, paleodietary assessment and nutritional
participant-observation will provide students with the tools to evaluate
human diet from skeletal and fossil collections through contemporary
cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and
ANTH 544/FCSJ 544.
Equivalent to: FCSJ 544
Recommended: ANTH 240 or ANTH 330

ANTH 546. FORENSIC ANTHROPOLOGY. (4 Credits)
Concepts and practices in the use of anthropology in legal matters and
police cases, especially involving identification of human remains.
Recommended: ANTH 443

ANTH 547. METHODS IN FOOD IN CULTURE AND SOCIAL JUSTICE
STUDIES. (4 Credits)
Exposes graduate students to the methodological approaches and
methods used in guiding empirical research on the socio-cultural aspects
of food, focusing on vulnerable populations, food security, procurement,
foodways, disasters, and climate change. Methodological approaches
and methods as evidenced in peer-reviewed publications is the grounding
for the course. CROSSLISTED as ANTH 547/FCSJ 547.
Equivalent to: FCSJ 547

ANTH 548. EVOLUTIONARY MEDICINE. (4 Credits)
Evolutionary medicine is founded on the idea that many challenges
to human health can be accounted for by discordances between
contemporary environments and those under which humans evolved.
This course examines ways anthropologists may help to reframe
questions about diseases within long-term, evolutionary contexts.
Recommended: (ANTH 110 or ANTH 210) and (ANTH 240 or ANTH 330)

ANTH 549. BIOCULTURAL PERSPECTIVES ON HUMAN REPRODUCTION.
(4 Credits)
Examines human reproduction and sexuality from the perspective of the
New Biocultural Synthesis, a theoretical approach in anthropology that
examines the interface of evolved biological, sociocultural and political-
economic factors that interact to produce complex human behaviors
and technologies. Topics are presented from a life-history perspective
where questions related to human reproduction and evolutionary history are
examined across the lifespan from mating and conception through
elderhood and menopause. Lec/lab

ANTH 550. TOPICS IN LINGUISTIC ANTHROPOLOGY. (1-4 Credits)
Recent advances in the study of culture and communication and their
application to special fields of study. Topics vary from term to term.
This course is repeatable for 16 credits.
Recommended: 3 credits of linguistic anthropology.

ANTH 551. LINGUISTIC ANTHROPOLOGY. (4 Credits)
The study of language in social context including the relationships
between language and age, gender, personality, religion, ethnicity
and social class. Examines pidgins, creoles, dialects, genres and the
processes of language change.
Recommended: ANTH 251 or ANTH 350
ANTH 552. FOLKLORE AND EXPRESSIVE CULTURE. (4 Credits)
The study of folklore/popular culture in its social and historical context. Examines content, structure, communicative potential, and performative aspects of various forms of oral and written expression. Includes familiarization with the analysis of myths, legends, tall tales, proverbs, riddles, and play languages.
Recommended: ANTH 251 or ANTH 350

ANTH 553. COMMUNITY HEALTH FIELD SCHOOL. (3-12 Credits)
Meets the growing need for international experiences for students in medical anthropology; international public health; and women, gender and sexuality studies. The field school is offered over a three- to seven-week period during the summer term. In-country time is flexible and can be adjusted depending on program requirements and financial constraints. Provides an intensive cross-cultural field experience in San Juan, Puerto Rico, that is premised on a model of community-engaged, service learning and applied, emancipatory research. This course is repeatable for 12 credits.

ANTH 555. REPRODUCTIVE JUSTICE: A SERVICE LEARNING COURSE. (4 Credits)
Reproductive Justice is a service-learning course that aims to bridge theory and practice in reproductive health and social justice by developing connections between the university campus and members of the local community.

ANTH 556. SOCIAL NETWORK ANALYSIS: METHODS AND THEORY. (4 Credits)
An introduction to social network analysis (SNA), focusing on the methods of research design, data collection, and analysis. Students will learn key concepts and theories of SNA, apply these concepts to research projects in their chosen field, develop methods for collecting network data, and perform qualitative and quantitative analysis of these networks. Readings draw on studies of social networks from a variety of disciplines, including anthropology, sociology, environmental studies, public health, and political science.

ANTH 559. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ANTH 459/ES 459/WLC 459.
Equivalent to: ES 559, WLC 559

ANTH 560. ETHNOGRAPHIC FIELD SCHOOL. (6 Credits)
Involves an intensive field experience, learning and developing practical skills for operating socially and culturally in another culture. Students engage in anthropological and mixed research topics, methods, and analysis, such as research ethics, research design, participant observation, ethnographic interviewing, community mapping, qualitative and quantitative data analysis.

ANTH 561. NEUROANTHROPOLOGY. (4 Credits)
The emerging interdisciplinary field of neuroanthropology combines anthropological understandings of human biological and cultural variation with recent findings in neuroscience. Key topics include socialization and enculturation, addiction, ritual, depression, and psychiatric disorders.
Recommended: ANTH 240 or ANTH 345 or ANTH 383

ANTH 565. POPULAR CULTURE: AN ANTHROPOLOGICAL PERSPECTIVE. (4 Credits)
Introduces some of the debates and issues swirling around analyses of late twentieth, early twenty-first century popular/mass/public/mediated/commercial culture. Learning about its pervasive forms, its origins and effects, how we are situated in it, and how it situates us is vital to understanding the changes that characterize our postmodern world.

ANTH 566. RURAL ANTHROPOLOGY. (4 Credits)
Concentrates on study of socio-cultural dynamics in rural communities as they develop in national and global contexts of political and economic change. Includes anthropological readings on rural issues in domestic and international contexts and a research paper on a contemporary rural issue.
Recommended: 3 credits of social science.

ANTH 567. AGRI-FOOD MOVEMENTS. (4 Credits)
Investigates the origins and contemporary status of producer and consumer food movements including, but not limited to, organics, agricultural labor movements, animal welfare, vegetarian and vegan movements, farmers’ markets, and permaculture. CROSSLISTED as ANTH 567/FCSJ 567.
Equivalent to: FCSJ 567

ANTH 568. ANTHROPOLOGY OF CHILDHOOD. (4 Credits)
Ethnographies of the organization of children’s lives in different cultural contexts are combined with readings on the conceptual and methodological genealogies that have constructed children as research subjects in anthropology.
Recommended: 3 credits of social science

ANTH 569. ENERGY IN CULTURAL PERSPECTIVE. (4 Credits)
Examines historical and current trends in energy around the globe. Course themes include the role of energy in economic development, cultural innovation in energy production, social problems that arise from energy shortages or the uneven distribution of energy resources and social and cultural changes required as societies attempt to reduce their dependence on fossil fuels.
Recommended: ANTH 110 or ANTH 210

ANTH 570. TOPICS IN CULTURAL ANTHROPOLOGY. (1-16 Credits)
Covers recent advances in cultural anthropology and their applications to the field. Topics vary from term to term. This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 571. CASH, CLASS AND CULTURE: HUNTER-GATHERERS TO CAPITALISM. (4 Credits)
Students explore the cultural and social effects of capitalism in the contemporary world within the larger question of how economics and society intersect and change over time. Special emphases are put on food and work, but students explore the linkages of global forces and local life in a variety of ways.
Recommended: 3 credits of social science.

ANTH 572. CONTEMPORARY INDIAN ISSUES. (4 Credits)
Examines the background of Indian treaties and reservations with discussions of present issues such as health care, education, the Indian Child Welfare Act, fishing rights, and religious freedom. Issues are discussed in class with considerable class participation and some role playing.
Recommended: 3 credits of social science.
ANTH 573. GENDER, ETHNICITY, AND CULTURE. (4 Credits)
Study of the practices and ideologies of gender as they intersect with those of ethnicity, race, class, and culture.
Recommended: 3 credits of social science.

ANTH 574. CROSS-CULTURAL HEALTH AND HEALING. (4 Credits)
A comprehensive overview of current issues in global health with particular emphasis on social, cultural, and behavioral interventions. Explores issues of health and development in the international context, focusing on such issues as inequality, structural adjustment, economic development, and community-based approaches to health care, specific cultural beliefs and practices, and the influences of people's perceptions of health, illness, and healing.

ANTH 575. THEORY OF CULTURE. (4 Credits)
Core ideas in the discipline of anthropology. Examination of the contributions to anthropological method and theory of the major schools of thought in the history of anthropology.
Recommended: 9 credits of upper-division social science, including at least one 400-level anthropology course.

ANTH 576. ADVANCED ANTHROPOLOGICAL THEORY SEMINAR. (4 Credits)
Investigates theories used by current anthropologists to explicate issues of concern in a world of movement, fragmentation, global-local interactions, indviduation via state and media unequal power relations, and neoliberal agendas. Students will participate in discussions, essays and a paper that links these theories to their research topics for theses or dissertations.
Recommended: ANTH 575

ANTH 577. ECOLOGICAL ANTHROPOLOGY. (4 Credits)
Examines past and present interactions between humans and their environments. Emphasizes the concept of system and process of human adaptation.
Recommended: 3 credits of social science

ANTH 578. ANTHROPOLOGY OF TOURISM. (4 Credits)
Examines the cultural practices and impacts of tourism in relation to both host and guest communities, and travel itself as a part of culture. We will explore theories of tourism and what role anthropology can play in influencing the industry and tourist and host relationships.
Recommended: 3 credits of social science.

ANTH 579. ANTHROPOLOGY OF MIGRATION. (4 Credits)
Focuses on the multiple aspects of population movements around the globe. Investigates the history of recent human migration; current theories, trends and policies; as well as issues of immigrant incorporation and anti-immigrant politics.
Recommended: 3 credits of social science.

ANTH 580. TOPICS IN APPLIED ANTHROPOLOGY. (1-4 Credits)
Recent advances in applied anthropology and their application to special fields of study. Topics vary from term to term. 
This course is repeatable for 16 credits.
Recommended: 3 credits of social science.

ANTH 581. NATURAL RESOURCES AND COMMUNITY VALUES. (4 Credits)
Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology.
Recommended: 3 credits of social science.

ANTH 582. ANTHROPOLOGY OF INTERNATIONAL DEVELOPMENT. (4 Credits)
Examines the ideological and theoretical bases of world assistance programs and their effects on different sectors and classes, including women. Causes of world hunger in terms of agronomic, mainstream economic and radical economic paradigms are developed and contrasted.
Equivalent to: AG 582

ANTH 583. ADVANCED MEDICAL ANTHROPOLOGY. (4 Credits)
An overview of anthropological studies of the health of human communities from a biological and behavioral perspective. Topics include prehistory of disease, cultural perspectives on causation of disease and approaches to healing; anthropological approach to international health issues; and case studies.
Recommended: (ANTH 110 or ANTH 210) and (ANTH 240 or ANTH 330)

ANTH 584. WEALTH AND POVERTY. (4 Credits)
Summarizes the distribution of wealth observed cross-culturally and through time. Determines the relation between wealth distribution and economic productivity. Shows the impact of industrialization and economic wealth distribution in Western civilization and cross-culturally. Evaluates how cultural practices affect wealth distribution in Western and non-Western societies.
Recommended: 3 credits of social science.

ANTH 585. USES OF ANTHROPOLOGY. (4 Credits)
Examines the practical applications of anthropological knowledge in historical and contemporary contexts. Focuses on planned social change and roles of anthropologists in interdisciplinary research and nonacademic settings such as international business, industrial relations, economic and technological development, education, legal institutions, environmental change, minority relations, health care, and cultural preservation. Emphasizes relevance to public policy and ethical issues associated with applications of anthropological knowledge.
Recommended: 3 credits of social science.

ANTH 586. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Equivalent to: FCSJ 586
Recommended: 3 credits of social science.

ANTH 587. LANGUAGE IN GLOBAL CONTEXT. (4 Credits)
Deals with practical uses of linguistics in the global political arena. Explores use of official vs. unofficial languages, language standardization, the preservation of dying languages; problems in learning first and second languages, and the relevance of linguistic knowledge to education and cross-cultural communication.
Recommended: ANTH 251 or ANTH 350 or some knowledge of linguistic structure

ANTH 590. TOPICS IN METHODOLOGY. (1-4 Credits)
Recent advances in anthropological methodologies and their application to special fields of study. Topics vary from term to term.
This course is repeatable for 16 credits.
Recommended: 6 credits anthropology
ANTH 591. ETHNOGRAPHIC METHODS. (4 Credits)
Cultural descriptions are produced through systematic observation, elicitation, and analysis to achieve proximity to the insider's point of view. Covers techniques of interviewing, validating, and interpreting cultural data. Allows students to practice what they have learned.
Recommended: 6 credits of anthropology

ANTH 592. ARCHAEOLOGICAL LABORATORY METHODS. (1-3 Credits)
Provides information on the basics of archaeological laboratory work. Students learn the day-to-day operations of a lab, how to classify and catalog artifacts, and how to do artifact analysis.
Recommended: 6 credits of anthropology

ANTH 593. STATISTICAL APPLICATIONS IN ANTHROPOLOGY. (4 Credits)
develops the skills necessary to use statistical software to analyze and interpret numerical data. Covers descriptive statistics, correlation, and multivariate statistical procedures. Evaluate the adequacy of data for parametric and nonparametric statistical tests.
Recommended: A minimum of 6 credits of anthropology if an undergraduate

ANTH 595. ANTHROPOLOGICAL RESEARCH DESIGN. (4 Credits)
Critical examination of research design and methodology in anthropology; analysis of methods and procedures of research in the subfields of anthropology.
Recommended: 9 credits of upper-division social science, including at least one 400-level anthropology course.

ANTH 597. ARCHAEOLOGICAL FIELD METHODS. (1-3 Credits)
Archaeological field strategies emphasizing reconnaissance and survey. Application of field equipment and project management.

ANTH 598. ORAL TRADITIONS. (3 Credits)
Method of examining unwritten culture preserved in speech, including local history, folklore, and songs passed from one generation to another. May include the use of life history, genealogy, and other means of collecting information. Attention is given to ethics, legal issues, and the process of transcription.
Recommended: ANTH 350

ANTH 599. SPECIAL TOPICS IN ANTHROPOLOGY. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 602. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

ANTH 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ANTH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 609. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ANTH 609. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Applied Economics (AEC)

AEC 121. DISCOVERING AGRICULTURAL AND RESOURCE ECONOMICS. (1 Credit)
Explore issues, opportunities, and challenges in the dynamic and diverse employment field of agricultural and resource economics.
Equivalent to: AREC 121

AEC 199. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Equivalent to: AREC 199
This course is repeatable for 8 credits.

AEC 211. AGRICULTURAL AND FOOD MANAGEMENT. (4 Credits)
Economic and business principles applied to the management of firms in agricultural and food industries, including farms, ranches and nurseries, agricultural input suppliers, packers, shippers, processors and food manufacturers and distributors; firm-level goal setting, information management and financial analysis.
Prerequisites: AEC 250 with C- or better or AEC 251 with C- or better or AREC 250 with C- or better or ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: AREC 211

AEC 221. AGRICULTURAL AND FOOD MARKETING. (3 Credits)
Organization and functions of agricultural and food markets both domestic and international; market channels and supply chains for various agricultural commodities and food products; role of agribusiness, cooperatives, and government in marketing decisions.
Prerequisites: AEC 250 with D- or better or AEC 251 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AREC 221

AEC 240. RURAL ECONOMICS OF PLACE AND PEOPLE. (3 Credits)
Provides perspective on issues influencing rural communities and economic development in rural America. People, places and natural resources of rural communities play a vital role in economic vitality of the West, yet rural landscapes are changing faster than many urban counterparts. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: AREC 240
AEC 243. *GLOBAL POVERTY AND SUSTAINABLE DEVELOPMENT. (3 Credits)
Students are introduced to the challenges of eradicating extreme poverty and achieving sustainable economic development in the world. Topics include: the measurement of poverty and inequality; analysis of food security and agricultural development; the role of health and education in economic development; credit markets; risk and insurance; climate change and biodiversity; gender equality; rural-urban and international migration; population growth and development; institutions and economic performance; the political economy of development. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

AEC 250. *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: AEC 250H, AREC 250, AREC 250
Recommended: MTH 111

AEC 250H. *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: AEC 250
Recommended: MTH 111

AEC 251. *INTRODUCTION TO AGRICULTURAL AND FOOD ECONOMICS. (3 Credits)
An introductory applied microeconomics course focused on the unique challenges of agricultural and food systems. Topics include rational choice theory, models of supply and demand, and price formation, with particular attention on markets for agricultural and food products. Additional topics include market interdependencies, government policy, the behavior of firms, and market structure within agricultural and food systems. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Recommended: MTH 111

AEC 253. *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS. (4 Credits)
A general introduction to federal environmental law and policy in the U.S. Familiarizes students with basic legal institutions and concepts of the American legal system, outlines the transition of environmental policy from its common law roots to its modern administrative law form, and gives an overview of the major federal environmental statutes. Relationships among legal theory and process and economic principles are emphasized. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: AREC 253

AEC 299. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Equivalent to: AREC 299
This course is repeatable for 8 credits.

AEC 310. EXPLORING EXPERIENTIAL LEARNING OPPORTUNITIES. (2 Credits)
Provides background and preparation for students' experiential learning (EL) activities. Students will be shown examples of appropriate EL, how to find and compete for opportunities, and how to establish and define their learning objectives for EL. Resume writing, appropriate conduct in the workplace, as well as writing and oral presentation skills will be covered. A proposal for an EL activity will be prepared and presented to classmates. Graded P/N.
Recommended: WR 121

AEC 311. INTERMEDIATE APPLIED ECONOMICS I: PRODUCERS AND CONSUMERS. (4 Credits)
An examination of the theories of consumer behavior and demand, production cost, the firm, supply, and competitive and monopoly market structures.
Prerequisites: ((AEC 250 with C- or better or AREC 250 with C- or better) or AEC 251 with C- or better or (ECON 201 with C- or better or ECON 201H with C- or better)) and (MTH 241 [C-] or (MTH 251 [C-] or MTH 251H [C-]))
Equivalent to: AREC 311

AEC 313. INTERMEDIATE APPLIED ECONOMICS II: MARKETS, WELFARE & POLICY. (4 Credits)
Complementing the private-decision focus in AEC 311, the present course focuses on the intermediate microeconomic theory of social welfare and public decision-making. Topics include exchange, monopoly, game theory, social welfare, externalities, public goods and choice, asymmetric information, uncertainty, and cost-benefit analysis. Substantial attention will be given to the implications of these theories for real-world problems, especially regarding resource and environmental issues.
Prerequisites: MTH 241 with C- or better or (AEC 311 with C- or better or AREC 311 with D- or better or ECON 311 with C- or better)
Equivalent to: AREC 313

AEC 351. *NATURAL RESOURCE ECONOMICS AND POLICY. (3 Credits)
Application of principles of economics to identify the causes, consequences, and ways of dealing with natural resource problems, including problems associated with fisheries, forests, water resources, and land. Conceptual topics and policy applications. Emphasis is on developing students' skill in applying an economic way of thinking about natural resource management. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: (AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better)
Equivalent to: AREC 351

AEC 352. *ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Provides an overview of the interrelationships between economic activity, the environment, and public policy. Through case studies, discussion groups, readings, and group activities, students learn how economists define and analyze environmental problems and the types of policies they advocate for managing environmental quality. CROSSTLISTED as AEC 352/ ECON 352. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AREC 352
AEC 353. *INTRODUCTION TO COASTAL AND MARINE RESOURCE ECONOMICS. (3 Credits)
Introduces tools of economic analysis for understanding coastal and marine resource management. Surveys a selection of current topics in the field, emphasizing innovation in production and stewardship, institutions, and sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: MTH 111 with C- or better and (AEC 250 [C-] or AREC 250 [C-] or ECON 201 [C-] or ECON 201H [C-])

AEC 372. AGRICULTURAL COOPERATIVES. (3 Credits)
An introduction to and in-depth examination of the agricultural cooperative. Students will gain a working knowledge of the concepts, principles, and terminology of agricultural cooperatives through reference materials, lectures, presentations by guest speakers and a cooperatives tour. Students will consider the strengths and weaknesses of the agricultural cooperative as well as the unique management and operational challenges inherent to this form of business operation.
Prerequisites: AEC 211 with D- or better or AREC 211 with D- or better
Equivalent to: AREC 372

AEC 388. AGRICULTURAL LAW. (4 Credits)
Application of legal principles to business decision making in farming, ranching, and the agricultural support industry. Consideration of the obligations arising out of contract, tort, property, water, public land, and natural resource law.
Equivalent to: AREC 388

AEC 399. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Equivalent to: AEC 399H, AREC 399H
This course is repeatable for 8 credits.

AEC 399H. SPECIAL TOPICS. (1-4 Credits)
Targeted courses that focus on specific topics in agricultural and resource economics. Topics may vary from term to term and from year to year. May be repeated for credit when topics differ.
Attributes: HNRS – Honors Course Designator
Equivalent to: AEC 399, AREC 399
This course is repeatable for 8 credits.

AEC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AREC 401
This course is repeatable for 16 credits.

AEC 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AREC 402
This course is repeatable for 16 credits.

AEC 403. THESIS. (1-16 Credits)
Equivalent to: AREC 403
This course is repeatable for 16 credits.

AEC 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AREC 405
This course is repeatable for 16 credits.

AEC 406. PROJECTS. (1-16 Credits)
Equivalent to: AREC 406
This course is repeatable for 16 credits.

AEC 407. SEMINAR. (1-16 Credits)
Equivalent to: AEC 407H, AREC 407, AREC 407H
This course is repeatable for 16 credits.
AEC 444. COMMODITY FUTURES AND OPTIONS MARKETS. (4 Credits)
Provides an overview of the basic concepts needed to use commodity futures and options markets to successfully manage price risk. To address the increasingly global economy in which commodity transactions occur, the course also includes financial futures such as interest rates and currencies. Specific topics covered include contract standardization, speculation and hedging, opening and closing of positions, and basis, i.e. the relationship between cash and futures markets, input-output hedges, and spreads. Students also gain hands-on experience through a trading simulation.
Equivalent to: AREC 444

AEC 446. INTRODUCTION TO APPLIED ECONOMETRICS. (4 Credits)
Introduces students to applied econometrics: the use of statistical techniques to estimate and test economic relationships. Topics include multiple regression models, multicollinearity, and simultaneous equations. The applications and labs will focus on econometric analysis of real world problems pertaining to issues in environmental, food, and resource economics and policy. Lec/lab.
Prerequisites: AEC 311 with D- or better and ST 351 [D-]

AEC 447. AGRICULTURAL PRICE AND MARKET ANALYSIS. (4 Credits)
Price determination for food and agricultural commodities; development of quantitative economic models that explain and predict prices and other market outcomes. Lec/lab.
Equivalent to: AREC 447
Recommended: AEC 311 and ST 351

AEC 448. ADVANCED TOPICS IN ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Explores advanced applications of environmental and resource economics to selected policy and management concerns in the PNW and globally. Attention will be directed to the methodological underpinnings of environmental and resource policies and instruments used in case studies on real world management issues.
Prerequisites: AEC 311 with D- or better and AEC 351 [D-] and AEC 352 [D-]
Equivalent to: AREC 448

AEC 452. MARINE ECONOMICS. (3 Credits)
Economic aspects of marine resource utilization and management will be analyzed. Topics include open access aspect of marine resources; conflict and allocation of marine resources, marine resource markets, marine recreation, pollution, and aquaculture, with special emphasis on commercial fisheries.
Prerequisites: AEC 351 with D- or better or AEC 352 with D- or better or AREC 351 with D- or better or AREC 352 with D- or better
Equivalent to: AREC 452

AEC 453. CONSERVATION ON PRIVATE LAND. (3 Credits)
Explore and experience the increasingly popular phenomenon of conservation on private land. This exploration includes the explosive growth of land trusts and the use of conservation easements to restrict the use of private land and often promote ecological goals.
Prerequisites: AEC 221 with D- or better and (AEC 250 [D-] or AEC 251 [D-] or ECON 201 [D-])

AEC 454. RURAL DEVELOPMENT ECONOMICS AND POLICY. (3 Credits)
Learn economic and regional development conceptual frameworks. Explore U.S. rural development and government interventions. Discuss differing popular local strategies for development that emphasize building current assets like local entrepreneurship to attracting resources and incomes from outside the region like amenity migration and tourism.
Equivalent to: AREC 454

AEC 455. PROGRAM EVALUATION. (3 Credits)
Explores the leading methods for evaluating the effectiveness of public programs and policies, specifically focusing on causal inference and empirical applications.
Prerequisites: (AEC 311 with C- or better or ST 351 with C- or better) and AEC 313 [C-]

AEC 460. CAPITAL INVESTMENT ANALYSIS USING AGBIZ LOGIC. (3 Credits)
Learn and understand the important factors in measuring the impacts of implementing technologies and/or conservation practices, adding value to products, or changing cropping systems or livestock enterprises. The AgBiz LogicTM software programs will be used to apply financial and economic principles to better understand and reduce the financial, production, marketing, and human resource risks facing agribusinesses.
Equivalent to: AREC 460

AEC 461. AGRICULTURAL AND FOOD POLICY ISSUES. (4 Credits)
Principles of agricultural and food policy formulation; agricultural adjustment processes; agricultural price and income policies in relation to land use, water, and rural development policies; interrelationships among U.S. and foreign agriculture and trade policies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better) and (AEC 300 [D-] or AREC 300 [D-] or AEC 311 [D-] or AREC 311 [D-] or ECON 311 [D-])
Equivalent to: AREC 461

AEC 465. AGRICULTURAL AND FOOD FINANCIAL MANAGEMENT. (4 Credits)
Students will develop risk management strategies utilizing the AgBiz Logic program to reduce the financial, production, marketing, and human resource risks facing agribusinesses. This course is designed to help students apply financial and economic principles to business decisions under diverse and changing circumstances. The course reviews basic financial reporting statements, details accounting and financing practices specific to agricultural and food enterprises.
Prerequisites: (AEC 211 with D- or better or AREC 211 with D- or better) and AEC 311 [D-]
Equivalent to: AREC 465

AEC 466. AGRICULTURAL AND FOOD MARKETING MANAGEMENT. (4 Credits)
Principles, trends, issues, barriers, policies, strategies and decisions involved in domestic and international marketing of perishable and storable agricultural commodities and food products from the point of production to the point of consumption. Topics include firm-level marketing concepts, the integration of marketing with firms’ overall strategic management goals, as well as comparative studies across multiple outlets for agricultural and food products, to include local, regional, and global markets.
Prerequisites: AEC 221 with D- or better and (AEC 250 [D-] or AEC 251 [D-] or ECON 201 [D-])

AEC 475. WRITING BUSINESS PLANS: AGRICULTURE/FOOD-RELATED ENTERPRISES. (2 Credits)
Students choose an enterprise and write a comprehensive business plan that describes the business vision, marketing plan, financial projections, risk management, and implementation strategy. At the end of term selected students present their plan to a commercial lender.
Equivalent to: AREC 475
Recommended: AEC 211 and AEC 221
AEC 499. SPECIAL TOPICS. (1-16 Credits)
Various topics in agricultural and resource economics of special and current interest not covered in other courses.
Equivalent to: AREC 499
This course is repeatable for 16 credits.

AEC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AEC 501
This course is repeatable for 16 credits.

AEC 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

AEC 503. THESIS. (1-16 Credits)
Equivalent to: AEC 503
This course is repeatable for 999 credits.

AEC 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AEC 505
This course is repeatable for 16 credits.

AEC 506. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

AEC 507. SEMINAR. (1-16 Credits)
Equivalent to: AEC 507
This course is repeatable for 16 credits.

AEC 508. WORKSHOP. (1-16 Credits)
Equivalent to: AEC 508
This course is repeatable for 16 credits.

AEC 512. MICROECONOMIC THEORY I. (4 Credits)
Fundamental topics in microeconomic theory. Topics include utility maximization and consumer demand, profit maximization and the theory of the firm, and labor and capital markets.
Recommended: AEC 312 and MTH 252

AEC 513. MICROECONOMIC THEORY II. (4 Credits)
Emphasizes principles for microeconomic theory at the master’s level. Builds upon the foundations covered in AEC 512, and extends the theory and principles to cover uncertainty, game theory, competitive market equilibrium and welfare analysis, imperfect competition, and market failures. Primary emphasis is on understanding microeconomic theory and the underlying assumptions, and how it is applied to real world settings.
Prerequisites: AEC 512 with C or better

AEC 521. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the ‘social safety net’ that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSLISTED as RS 521.
Equivalent to: AEC 521, RS 521

AEC 525. APPLIED ECONOMETRICS. (4 Credits)
General principles of applied econometric research are emphasized, including model building, data analysis, hypothesis testing, and evaluation and interpretation of results. A variety of estimators are applied to real data, including least squares, panel data, simultaneous equations, discrete choice, and limited dependent variable models.

AEC 532. ENVIRONMENTAL LAW. (4 Credits)
Legal relationships arising out of rights to air, water, and rights to air, water, and land. The impact of federal and state regulation on pollution control and on the production, use, and disposal of hazardous materials.
Equivalent to: AREC 532

AEC 534. ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Examines environmental and natural resource issues emphasizing the role of economics in understanding their causes, consequences, and potential solutions (e.g., air, water, fish, forests, climate change, biodiversity). Reviews welfare economics, market failures, externalities, property rights. Covers non-market valuation, innovative market and regulatory policies.
Equivalent to: AREC 534
Recommended: AEC 311 or AREC 311

AEC 540. THE ECONOMICS OF BUSINESS ORGANIZATION IN THE FOOD SYSTEM. (4 Credits)
Application of economic analysis to questions related to the choice of an appropriate form of business organization for a wide variety of food system enterprises. Topics include costs of contracting, costs of ownership, enterprise scope and scale, and the dynamics of business ownership and structure. Particular emphasis is given to entrepreneurial enterprises and cooperative businesses in the food system.
Recommended: AEC 311 or ECON 311

AEC 543. INTERNATIONAL TRADE. (4 Credits)
Introduction to the major theories of international trade and to models that are useful for applied policy and regional analysis. Effects of trade and trade policy on consumers, workers, and firms are emphasized.
Prerequisites: AEC 513 with C or better
Equivalent to: AREC 543

AEC 544. COMMODITY FUTURES AND OPTIONS MARKETS. (4 Credits)
Provides an overview of the basic concepts needed to use commodity futures and options markets to successfully manage price risk. To address the increasingly global economy in which commodity transactions occur, the course also includes financial futures such as interest rates and currencies. Specific topics covered include contract standardization, speculation and hedging, opening and closing of positions, and basis, i.e. the relationship between cash and futures markets, input-output hedges, and spreads. Students also gain hands-on experience through a trading simulation.
Equivalent to: AREC 544

AEC 546. INTRODUCTION TO APPLIED ECONOMETRICS. (4 Credits)
Introduces students to applied econometrics: the use of statistical techniques to estimate and test economic relationships. Topics include multiple regression models, multicollinearity, and simultaneous equations. The applications and labs will focus on econometric analysis of real world problems pertaining to issues in environmental, food, and resource economics and policy. Lec/lab.
Recommended: AEC 311 and ST 351

AEC 548. ADVANCED TOPICS IN ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Explores advanced applications of environmental and resource economics to selected policy and management concerns in the PNW and globally. Attention will be directed to the methodological underpinnings of environmental and resource policies and instruments using case studies on real world management issues.
Recommended: AEC 311 and AEC 351 and AREC 352

AEC 550. ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS. (4 Credits)
Presents concepts, theories, and methods used in the economic analysis of environmental and natural resource issues. The emphasis is on the economics of environmental policies and the development of decision rules regarding the efficient use of natural resources.
Prerequisites: AEC 512 with C or better
Equivalent to: AREC 550
AEC 551. APPLICATIONS OF ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS. (4 Credits)
Applies and expands upon concepts, theories, and methods in environmental and natural resource economics introduced in AEC 550. Topics include non-market valuation, discounting, and benefit-cost analysis, as well as the role and importance of institutions, appropriate research methods, and the philosophical basis for normative judgments in economics.
Prerequisites: AEC 550 with C or better or AREC 550 with C or better
Equivalent to: AREC 551

AEC 552. MARINE ECONOMICS. (3 Credits)
Economic aspects of marine resource utilization and management will be analyzed. Topics include open access aspects of marine resources; conflict and allocation of marine resources, marine resource markets, marine recreation, pollution, and aquaculture, with special emphasis on commercial fisheries. CROSSLISTED as AEC 552/MRM 552.
Equivalent to: AEC 552, MRM 552
Recommended: (AEC 351 or AEC 352 or AREC 351 or AREC 352)

AEC 553. CONSERVATION ON PRIVATE LAND. (3 Credits)
Explore and experience the increasingly popular phenomenon of conservation on private land. This exploration includes the explosive growth of land trusts and the use of conservation easements to restrict the use of private land and often promote ecological goals.
Equivalent to: AREC 554

AEC 554. RURAL DEVELOPMENT ECONOMICS AND POLICY. (3 Credits)
Learn economic and regional development conceptual frameworks. Explore U.S. rural development and government interventions. Discuss differing popular local strategies for development that emphasize building current assets like local entrepreneurship to attracting resources and incomes from outside the region like amenity migration and tourism.
Equivalent to: AREC 554

AEC 555. PROGRAM EVALUATION. (3 Credits)
Explores the leading methods for evaluating the effectiveness of public programs and policies, specifically focusing on causal inference and empirical applications.

AEC 565. AGRICULTURAL AND FOOD FINANCIAL MANAGEMENT. (4 Credits)
Students will develop risk management strategies utilizing the AgBiz Logic program to reduce the financial, production, marketing, and human resource risks facing agribusinesses. This course is designed to help students apply financial and economic principles to business decisions under diverse and changing circumstances. The course reviews basic financial reporting statements, details accounting and financing practices specific to agricultural and food enterprises.
Equivalent to: AREC 565
Recommended: (AEC 211 or AREC 211) and AEC 311

AEC 566. AGRICULTURAL AND FOOD MARKETING MANAGEMENT. (4 Credits)
Principles, trends, issues, barriers, policies, strategies and decisions involved in domestic and international marketing of perishable and storable agricultural commodities and food products from the point of production to the point of consumption. Topics include firm-level marketing concepts, the integration of marketing with firms' overall strategic management goals, as well as comparative studies across multiple outlets for agricultural and food products, to include local, regional, and global markets.
Recommended: AEC 221 and (AEC 250 or AEC 251 or ECON 201)

AEC 599. SPECIAL TOPICS. (0-16 Credits)
Various topics in applied economics of special and current not covered in other courses. May be repeated for credit when topics differ.
Equivalent to: AREC 599
This course is repeatable for 16 credits.

AEC 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AREC 601
This course is repeatable for 16 credits.

AEC 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AREC 605
This course is repeatable for 16 credits.

AEC 603. THESIS. (1-16 Credits)
Equivalent to: AREC 603
This course is repeatable for 999 credits.

AEC 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AREC 605
This course is repeatable for 16 credits.

AEC 606. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

AEC 607. SEMINAR. (1-16 Credits)
Equivalent to: AREC 607
This course is repeatable for 16 credits.

AEC 608. WORKSHOP. (1-16 Credits)
Equivalent to: AREC 608
This course is repeatable for 16 credits.

AEC 611. ADVANCED MICROECONOMIC THEORY I. (4 Credits)
A rigorous development of the theory of consumption and production, with emphasis on duality.
Prerequisites: (AEC 512 with C or better and AEC 513 [C])
Recommended: MTH 254

AEC 612. ADVANCED MICROECONOMIC THEORY II. (4 Credits)
A rigorous extension of the theory of the consumer and firm to aggregate and heterogeneous populations, decision making under uncertainty, and related game theory concepts.
Prerequisites: AEC 611 with C or better

AEC 613. ADVANCED MICROECONOMIC THEORY III. (4 Credits)
A rigorous development of the theory of competitive equilibrium, market power, public goods, and information.
Prerequisites: AEC 612 with C or better
AEC 625. ADVANCED ECONOMETRICS I. (4 Credits)
Emphasizes the basic theory underlying the main types of estimators used in econometrics, as well as their application in empirical research. Includes derivation, properties, and application of method of moments, maximum likelihood, ordinary and generalized least squares, and instrumental variables estimators; statistical inference and hypothesis testing, and model building and specification analysis. Provides the necessary foundation for estimation techniques covered in AEC 626. Lec/lab.
Prerequisites: AEC 525 with C or better

AEC 626. ADVANCED ECONOMETRICS II. (4 Credits)
Extensions to the generalized linear regression model are considered: discrete choice, limited dependent variable, panel data, and simultaneous equations models, and new solutions to identification problems. Strong applied orientation, emphasizing problems of data measurement, model selection and specification.
Prerequisites: AEC 625 with C or better

AEC 627. COMPUTATIONAL ECONOMICS. (4 Credits)
 Covers the numerical analysis of static optimization models and stochastic dynamic models in resource and development economics, emphasizing formulation, solution, and simulation of dynamic optimization, rational expectations, and arbitrage pricing models. Lec/lab.

AEC 640. SUSTAINABLE DEVELOPMENT. (3 Credits)
Surveys research on the quantitative economic analysis of sustainable development, with an emphasis on integrated assessment methods and models and their application to agriculture and rural development policy, agricultural technology impact assessment, and climate change impact assessment.
Prerequisites: AEC 611 with D- or better and AEC 612 [D-] and AEC 625 [D-]
Equivalent to: AREC 640

AEC 643. ADVANCED TOPICS IN DEVELOPMENT ECONOMICS. (3 Credits)
Introduces students to key issues in the economics of development and equips them with the theoretical and empirical tools required to conduct advanced research in these topics.
Prerequisites: AEC 613 with C or better and AEC 626 [C]
Equivalent to: AREC 643

AEC 651. ADVANCED NATURAL RESOURCE ECONOMICS. (3 Credits)
Contemporary economic theory of dynamic natural resource allocation is introduced. Assignments focus on analytical and numerical methods for solving dynamic optimization problems in resource and environmental management. Lecture and readings emphasize current research trends in the field and relevant advances in quantitative methodology.
Prerequisites: AEC 611 with C or better
Equivalent to: AREC 651

AEC 652. ADVANCED ENVIRONMENTAL ECONOMICS. (3 Credits)
Interrelationships of natural resource use and the environment; applied welfare and benefit-cost analysis; externalities and pollution abatement; non-market valuation of resources; property rights; legal and social constraints; policy approaches.
Prerequisites: (AEC 513 with C or better or AREC 513 with C or better) and (AEC 525 [C] or AREC 525 [C])
Equivalent to: AREC 652

AEC 653. EMPIRICAL ENVIRONMENTAL AND RESOURCE ECONOMICS. (3 Credits)
Introduces empirical methods at the current frontiers of research in environmental and resource economics. General topics may include the identification of non-market values, revealed and stated preference methods, environmental policy evaluation, equilibrium sorting models, and climate econometrics.
Prerequisites: AEC 513 with C or better and AEC 525 [C]
Equivalent to: AREC 653

AEC 699. SPECIAL TOPICS. (1-16 Credits)
Various topics in applied economics of special and current interest not covered in other courses.
Equivalent to: AREC 699
This course is repeatable for 16 credits.

Applied Journalism (AJ)

AJ 199. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 12 credits.

AJ 299. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 6 credits.

AJ 308. WORKSHOP. (1-3 Credits)
This course is repeatable for 6 credits.

AJ 311. MEDIA STORYTELLING. (3 Credits)
Introduction to community journalism, with a focus on developing storytelling methodologies for a variety of media in firsthand reporting praxis.
Prerequisites: WR 121 with B or better

AJ 312. ADVANCED MEDIA STORYTELLING. (3 Credits)
Continued praxis in journalistic storytelling, with an emphasis on developing intensive hard news stories and photojournalistic essay packages through reporting government agencies.
Prerequisites: AJ 311 with B or better

AJ 313. PROFESSIONAL PRACTICES IN APPLIED JOURNALISM. (3 Credits)
Faculty, staff and students connect to generate in-depth critiques of polished journalistic projects, culminating in the production and distribution of a best practices job kit.
Prerequisites: AJ 311 with B or better and AJ 312 [B]
This course is repeatable for 6 credits.

AJ 408. WORKSHOP. (1-3 Credits)
This course is repeatable for 6 credits.

AJ 410. INTERNSHIP. (1 Credit)
Students seeking to obtain the Applied Journalism Minor must complete three sections of AJ 410 Internship, to include reporting, production and/or editorial duties at Orange Media Network (OMN).
This course is repeatable for 6 credits.

AJ 490. MEDIA LAW AND ETHICS. (3 Credits)
Exploring case studies and other analyses germane to the most relevant and pressing legal and ethical issues in contemporary journalism.
Prerequisites: AJ 311 with B or better
This course is repeatable for 6 credits.
Arabic (ARAB)

ARAB 111. FIRST-YEAR ARABIC. (4 Credits)
Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Initiation to Arabic culture and attitudes. Designed for students with no prior training in Arabic. Native and/or bilingual speakers of Arabic will not receive credit for ARAB 111, ARAB 112, ARAB 113.
Equivalent to: ARAB 111H

ARAB 199. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

ARAB 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ARAB 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ARAB 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Architectural Engineering (ARE)

ARE 301. ARE JUNIOR SEMINAR. (1 Credit)
Professional practices of architectural engineering.

ARE 352. DESIGN OF ELECTRICAL AND ILLUMINATION SYSTEMS FOR BUILDINGS. (0-4 Credits)
Design of electrical and illumination systems in buildings, including consideration of energy usage.
Prerequisites: CEM 471 with C or better

ARE 353. DESIGN OF HVAC SYSTEMS FOR BUILDINGS. (4 Credits)
Design and engineering of heating, ventilating, and air conditioning (HVAC) systems in buildings, including consideration of energy usage and indoor environmental conditions.
Prerequisites: CEM 472 with C or better

ARE 418. "ARCHITECTURAL ENGINEERING PROFESSIONAL PRACTICE. (4 Credits)
Principles and methods of solving architectural engineering problems in a studio setting, with considerations of space, form, function, and technology. Lec/rec. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ARE 351 with C or better and ARE 352 [C] and CE 382 [C]

ARE 419. "ARCHITECTURAL ENGINEERING DESIGN. (3 Credits)
A capstone design project experience exposing students to problems and issues similar to those encountered in the practice of architectural engineering. Use of Building Information Modeling (BIM) in design, construction management, and integration of architectural, structural, mechanical, electrical and lighting systems. Lec/rec. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ARE 418 with C or better

ARE 451. ADVANCED BUILDING CONSTRUCTION METHODS. (4 Credits)
Advanced building construction methods, including integration of building components in building envelopes. Lec/rec.
Prerequisites: CEM 442 with C or better

ARE 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ARE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ARE 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ARE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Art (ART)

ART 100. ART ORIENTATION. (1 Credit)
Introduction to the study of art and career options in fine arts, graphic design, photography, and art history.

ART 101. "INTRODUCTION TO THE VISUAL ARTS. (3 Credits)
An introductory lecture course using visual materials with emphasis on methods and motivations that generate the visual experience, both past and present. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core

ART 115. 2-D CORE STUDIO. (4 Credits)
Studio course that introduces the visual language, the elements of design, and the principles of organization. Emphasizes skills, concepts, and problem solving in the areas of two-dimensional design and color.
Attributes: LACF – Liberal Arts Fine Arts Core

ART 117. 3-D CORE STUDIO. (4 Credits)
Studio course examining three-dimensional design elements and their spatial organization. Emphasizes innovative problem solving and exposure to varied media. Gives students a sound conceptual basis to apply to more advanced media-oriented courses.

ART 121. DIGITAL CORE STUDIO. (4 Credits)
An introductory studio art class using computers in the visual arts. Project-based exploration of digital imaging, layout, 3-D rendering, and video. Examination of the impact of digital technology on the visual arts from contemporary and historical perspectives.

ART 131. DRAWING CORE STUDIO. (4 Credits)
Introductory studio course in drawing techniques with emphasis on developing skills in perception and visual organization. Lec/studio.
Attributes: LACF – Liberal Arts Fine Arts Core

ART 199. SPECIAL STUDIES. (0-16 Credits)
Equivalent to: ART 199H
This course is repeatable for 16 credits.

ART 204. "INTRODUCTION TO WESTERN ART: PREHISTORY TO THE HIGH MIDDLE AGES. (3 Credits)
A survey of the painting, sculpture, architecture, and decorative arts of Europe and the Mediterranean between the Paleolithic period and the eleventh century. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ART 205. "INTRODUCTION TO WESTERN ART: GOThic TO BAROQUE. (3 Credits)
A survey of the painting, sculpture, architecture, and decorative arts of Europe between the late Middle Ages and the seventeenth century. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ART 206. "INTRODUCTION TO WESTERN ART: NEOClassICISM TO CONTEMPORARY. (3 Credits)
A survey of painting, sculpture and other visual arts in the Western world from the late eighteenth century to the present. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
ART 208. *INTRODUCTION TO ASIAN ART. (3 Credits)
Introduces the distinctive, yet related, aesthetic traditions of South and Southeast Asia, Inner Asia, and East Asia. It focuses on architectural sites, sculptures, and paintings from prehistory to the present. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 210. *HISTORY OF WESTERN ARCHITECTURE. (3 Credits)
A survey of buildings and architectural thought in the West from antiquity to the twentieth century; focuses on major periods and movements of architectural history by examining building types, patrons, materials, building traditions, structural innovations and other critical aspects inherent to architecture. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ART 211. WOODTURNING WITH SCIENCE I. (4 Credits)
An introduction to scientific woodturning. Students will get a grounding in tools, lathes, sharpening, and set-up, and then will transition into turning basic forms (spindle and bowl). Particular relevance will be placed upon grain orientation, wood moisture content, wood anatomy, wood chemistry, wood species and extractive effects, and how all of these attributes affect both form and function. Class instruction will be entirely studio based. CROSSLISTED as ART 211/WSE 211.
Equivalent to: WSE 211
This course is repeatable for 8 credits.

ART 215. COLOR IN THE VISUAL ARTS. (4 Credits)
Studio course following ART 115 and ART 117 that examines the properties of colors and their interaction. Emphasizes problem solving and the experimental use of color.
Prerequisites: ART 115 with D- or better

ART 222. INTRODUCTION TO TIME-BASED ART. (4 Credits)
Introduction to time-based media using the computer as a tool. Studio art class developing skills in video art, sound art, performance, and other time-based digital arts. Exploration of sequential, experimental, historical, and contemporary themes and the role of the audience in time-based art.
Prerequisites: ART 121 with C- or better
Equivalent to: ART 122

ART 234. DRAWING II/FIGURE. (4 Credits)
Drawing from the life model with emphasis on skill and conceptual awareness as well as anatomical consideration.
Prerequisites: ART 131 with D- or better

ART 263. DIGITAL PHOTOGRAPHY. (4 Credits)
Introductory course in digital photography. Focus on creation of photographic images in series format. Technical camera operation will be emphasized as well as basic photographic composition, use of photographic editing software, historical grounding, and discussions of contemporary issues in photography. Students must have the use of a digital single lens reflex camera (DSLR) or mirrorless camera (with viewfinder and fully manual controls).
Recommended: ART 115 and ART 120

ART 264. *PHOTOGRAPHY: HISTORY, TECHNOLOGY, CULTURE AND ART. (3 Credits)
Introduction to the history of photography through aesthetic, cultural and technical contexts. This course covers the history of photography and its technologies, photography in art, some photographers and their photographs and the purposes of photography. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 271. PRINTMAKING I. (4 Credits)
Introduction to the basic processes of printmaking, with options among relief, lithography, intaglio, screen printing and monotype.
Prerequisites: ART 115 with C- or better and ART 131 [C-]

ART 281. PAINTING I. (4 Credits)
Introductory studio course with emphasis on basic materials and techniques in painting. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: ART 131 with C- or better

ART 291. SCULPTURE I. (4 Credits)
Studio course in basic materials and approaches used in sculpture; a foundation for further three-dimensional work. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: ART 117 with C- or better
Recommended: Art core curriculum

ART 306. ADVISOR REVIEW. (1 Credit)
A review, conducted by the student’s advisor and another faculty member of the student’s choosing, of work produced to date in the student’s area of concentration. Graded P/N.
Prerequisites: Fine Arts Portfolio Review with a score of 1

ART 310. *EARLY CHINESE ART AND ARCHAEOLOGY. (3 Credits)
Introduces major forms of Chinese art from the Neolithic period to the Tang dynasty (618-907 CE) and related major archaeological finds. Stresses the materials and processes of making art, development of representational art, and the role of visual arts in an aristocratic and religious culture. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 311. *LATE CHINESE ART AND CULTURE. (3 Credits)
Introduction to the major forms of Chinese art and visual culture from the eleventh century to the early twentieth century. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 312. *CONTEMPORARY CHINESE ART. (3 Credits)
Introduces origins and development of contemporary Chinese art and visual culture in its domestic and global contexts. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 313. *ART OF JAPAN. (3 Credits)
Surveys the arts of Japan from the prehistoric period to the twentieth century. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts

ART 320. *ANCIENT GREEK ART. (3 Credits)
Focuses on the major artistic developments in Ancient Greece from the Middle Bronze Age to 31 BCE, and especially on the city-state of Athens during the Fifth Century. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 321. *ANCIENT ROMAN ART AND ARCHITECTURE. (3 Credits)
Survey of ancient Roman art and culture between the sixth century BCE and fifth century CE, covering principal media, styles, and subject matter. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture
ART 322. *MEDIEVAL ART AND ARCHITECTURE. (3 Credits)
Survey of the art and architecture of the major periods and cultures of
Europe and the Mediterranean between the fourth and the fourteenth
century. Traces salient developments in thought and material culture of
western civilization. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture

ART 323. *ITALIAN RENAISSANCE ART AND ARCHITECTURE. (3 Credits)
Survey of Italian Renaissance art and culture, covering the principal
artists, patrons, media, styles, and subject matter. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West
Culture

ART 331. DRAWING CONCEPTS. (4 Credits)
Studio course emphasizing drawing composition as an investigative,
conceptualizing and communicative nonverbal language. Independent
thinking, problem solving, and creative development encouraged.
Prerequisites: ART 131 with C- or better and ART 234 [C-]
This course is repeatable for 6 credits.

ART 334. DRAWING III: FIGURE. (4 Credits)
Intermediate study of the human figure utilizing life models, the skeleton,
and anatomy texts. Emphasis on gaining greater knowledge of the body's
underlying structure and potential for aesthetic expression.
Prerequisites: ART 234 with D- or better and (Fine Arts Portfolio Review
with a score of 1 or Graphic Design Portfolio Review with a score of 1)
This course is repeatable for 12 credits.
Recommended: Art core curriculum.

ART 339. PROFESSIONAL PRACTICES FOR ARTISTS. (3 Credits)
Examination of relevant issues and realities facing working artists
today through class discussion, critical readings, gallery visits, guest
lectures and panel discussions. Development of professional practices
appropriate for artists and the business of art include portfolio
development, writing and presentation skills, grants, contracts, exhibition
opportunities and marketing strategies.
This course is repeatable for 6 credits.

ART 340. DARKROOM PHOTOGRAPHY I. (4 Credits)
Studio course in black-and-white film exposure and development,
and printing in the darkroom. The medium of silver-based black-and-
white photography is explored as a communication mode and art form.
Historical, conceptual, technical and legal aspects of traditional wet
processing are surveyed. Access to a single lens reflex (SLR) film camera
is required. Course fee.
Recommended: ART 263 for Photography majors

ART 341. DARKROOM PHOTOGRAPHY II. (4 Credits)
Improving silver-gelatin printing and photographic presentation
techniques. Emphasis on furthering creative visual language and
individual photographic project development. Studio and lecture course.
Student must supply a medium format or 35mm single lens reflex (SLR)
film camera. Lec/studio.
Prerequisites: ART 340 with D- or better

ART 345. INTERMEDIATE PHOTOGRAPHY. (4 Credits)
Emphasis is on both technical and aesthetic expression of digital
color photography, from initial image capture, color management to
finished print along with color symbolism and composition. Exploration
of narrative, sequencing and image-series concepts. Introduction to
contemporary color photographers. Studio.
Prerequisites: ART 263 with C+ or better

ART 346. PHOTO ILLUSTRATION I. (3 Credits)
Studio lighting. The 4x5 view camera. Sheet film. Black-and-white and
color illustration.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic
Design Portfolio Review with a score of 1)
Recommended: ART 262 and Art core curriculum

ART 347. PHOTOGRAPH: STUDIO LIGHTING. (4 Credits)
Practical studio class surveying the basic principles and application
of light in the creation of photographs. The development of craft and
technique inside the studio will be emphasized but formal and conceptual
considerations related to light and photography will also be explored.
Prerequisites: ART 263 with C or better
Recommended: ART 345

ART 348. CONCEPTS IN DIGITAL IMAGING. (4 Credits)
Approaches to non-traditional and the manipulated image in digital
photography with an emphasis on producing personal imagery.
Introduction to the history of the manipulated image in photography and
to contemporary approaches to digital photography.
Prerequisites: ART 263 with D- or better
Recommended: ART 121 or prior Photoshop knowledge

ART 349. VIDEO ART. (4 Credits)
Studio course in video art and time-based media projects. Emphasis
on experimental approaches to video art in a contemporary art context,
linear and non-linear video production and the projection and screening of
video art projects. Introduction to the history of video art as an art form.
Lec/studio. CROSSLISTED as ART 349/NMC 349.
Prerequisites: ART 222 with C- or better and ART 263 [C-]
Equivalent to: NMC 349
This course is repeatable for 8 credits.

ART 350. PHOTOGRAPHY ON ASSIGNMENT. (4 Credits)
An introduction to shooting photographs on assignment. Students will
create, edit, caption, and submit photographs for print publications,
online media, and alternative/independent media venues. Students will
experiment with text, audio slideshows, and other creative means of
illustrating concepts and ideas. Also covered are history, law, and ethics
of photojournalism.
Recommended: ART 263 or active knowledge of camera operations,
shooting RAW files and Adobe Lightroom.

ART 351. INSTALLATION. (4 Credits)
Studio/lecture course designed to acquaint the student with the
possibilities of using non-traditional means such as site, time, and
interaction to communicate ideas.
Prerequisites: ART 291 with D- or better and (Fine Arts Portfolio Review
with a score of 1 or Graphic Design Portfolio Review with a score of 1)
Recommended: Foundation curriculum

ART 352. *CREATIVE COLLABORATION: DESIGNING AND BUILDING. (3
Credits)
Working in multi-disciplinary teams, design, implement, and document
a piece of public art work or science museum display. Projects may
be made of any media, but must demonstrate creativity both in the
engineering used to create them and the technology and society
message they convey. CROSSLISTED as ART 352/ENGR 352. (Bacc Core
Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENGR 352
ART 354. ALTERNATIVE PROCESSES IN PHOTOGRAPHY. (4 Credits)
Historical photographic printing methods in use today e.g., cyanotype, gum bichromate and more. Use of digital and analog negatives, mixing emulsions and coating paper by hand.
Prerequisites: ART 263 with C- or better and ART 345 [C-]
Recommended: ART 340

ART 355. THE PHOTOGRAPHIC BOOK. (4 Credits)
Practical studio course focusing on the photographic book in all of its forms. Use appropriated imagery as well as original imagery to create a variety of zines as well as soft and hardcover photo-books. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. CROSSLISTED as ART 355/ GD 355.
Prerequisites: ART 263 with C- or better
Equivalent to: GD 355

ART 359. *PHOTOGRAPHY: ACTIVISM, AND SOCIAL CHANGE. (3 Credits)
Explores photography as an agent of social change through creative projects and topical discussions. Emphasis on the visual language, ethical considerations, and strategies employed by activist photographers that disrupt dominant ideologies and address institutionalized inequality and privilege in the United States. No prior photography experience necessary. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

ART 364. *NINETEENTH-CENTURY ART. (3 Credits)
Lecture course covering the principal movements and trends in late eighteenth-century and nineteenth-century architecture, painting, and sculpture in Europe and America, from Neoclassicism to Symbolism. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 365. *HISTORY OF MODERN ART 1900-1945. (3 Credits)
Lecture course covering the principal movements and trends in early twentieth-century Western art, from Expressionism to early American Modernism. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ART 366. ART SINCE 1945. (3 Credits)
Lecture course covering the principal movements, theories and ideas in visual art since 1945, including painting, sculpture, photography, installation, performance and participatory art.
Recommended: ART 204 and ART 205 and ART 206

ART 367. *HISTORY OF DESIGN. (3 Credits)
A survey of the impact of technology on the visual qualities of graphic, advertising, fashion, architecture, and industrial design from the Victorian Arts and Crafts Movement to the computer age. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

ART 368. *HISTORY OF PHOTOGRAPHY. (3 Credits)
The development of photographic processes and applications. Influential figures. From the early beginnings to contemporary trends. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ART 375. PRINTMAKING: RELIEF. (4 Credits)
Studio course in relief printmaking with emphasis on linocut and woodcut; may include other relief processes, i.e. photo polymer plate. Black-and-white and color.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 376. PRINTMAKING: INTAGLIO. (4 Credits)
Studio course in intaglio printmaking with emphasis on drypoint, line etching, aquatint, softground and photo process. Black-and-white and possibly color for final project.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 377. PRINTMAKING: LITHOGRAPHY. (4 Credits)
Studio course in lithographic printmaking with emphasis on gaining the stone, drawing with crayon and tusche, etching and reworking, inking and printing lithographic limestone. Black-and-white and possibly color for final project.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 378. PRINTMAKING: MONOTYPE. (4 Credits)
Studio course in monotype printmaking with emphasis on drawing/painting with brushes, oil pastels, watercolors, water-based crayons, inking with a lithographic roller and printing with an etching press. Black-and-white and color.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]

ART 379. PRINTMAKING: SCREEN PRINTING. (4 Credits)
Studio course in screen printing with emphasis on paper stencil, drawing fluid and photo emulsion processes. Students are exposed to a range of techniques and concepts are encouraged to investigate personal motivations while making multiple color prints.
Prerequisites: ART 115 with C- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
Recommended: Art core curriculum. ART 100, ART 101, ART 117, ART 131, ART 204, ART 205, ART 206.

ART 381. PAINTING II: THE FIGURE. (4 Credits)
Studio course with emphasis on painting from the live model; understanding the figure in terms of color, form and composition, the figure as symbol, implied narrative and vehicle of expression.
Prerequisites: ART 281 with C- or better and ART 234 [C-]
This course is repeatable for 8 credits.
Recommended: ART 234 and Art core curriculum.

ART 382. PAINTING II: CONCEPTS. (4 Credits)
Painting with emphasis on experimentation and an exploratory investigation of mixed media, new media, collage, and assemblage, utilizing either representation or abstraction.
Prerequisites: ART 281 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 8 credits.
Recommended: Art core curriculum.

ART 383. PAINTING II: ABSTRACT AND MULTIMEDIA. (4 Credits)
Intermediate studio course with emphasis on contemporary directions in painting: abstraction and non-literal approaches.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 281 [C-]
This course is repeatable for 12 credits.
Recommended: Art core curriculum.

ART 384. PAINTING II: NEW GENRE. (4 Credits)
Exploration of current directions in painting using traditional and non-traditional concepts and techniques.
Prerequisites: ART 281 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 12 credits.
ART 385. PAINTING II: ENCAUSTICS. (4 Credits)
Exploration and application of a variety of traditional and non-traditional techniques using encaustics paint; beeswax and pigment fused to a surface.
Prerequisites: ART 281 with C- or better
This course is repeatable for 8 credits.

ART 386. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE:
PART I. (4 Credits)
The first course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Conquest to Civil War. CROSSLISTED as ART 386/ENG 386.
Equivalent to: ENG 386

ART 387. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE:
PART II. (4 Credits)
The second course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Civil War to Harlem Renaissance. CROSSLISTED as ART 387/ENG 387.
Equivalent to: ENG 388

ART 388. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE:
PART III. (4 Credits)
The third course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Great Depression to Postmodernity. CROSSLISTED as ART 388/ENG 388.
Equivalent to: ENG 388

ART 391. SCULPTURE II. (4 Credits)
Intermediate studio course with emphasis in material research and developing greater skills and technical knowledge in sculptural fabrication processes.
Prerequisites: ART 291 with C- or better
This course is repeatable for 12 credits.
Recommended: Art core curriculum.

ART 395. SPECIAL TOPICS IN EARLY ART HISTORY. (3 Credits)
Intermediate studio course in painting with aqueous materials. Emphasis on media and composition. PREREQ: Core curriculum; ART 295.
This course is repeatable for 99 credits.

ART 396. SELECTED TOPICS IN MODERN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 397. SELECTED TOPICS IN GLOBAL ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 398. SPECIAL TOPICS IN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

ART 399H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

ART 400. THE DISCERNING PEN: ART CRITICISM. (3 Credits)
Writing on art history provides students with an opportunity to write about art using three distinct structures and styles while drawing on the student’s own ideas and opinions.
Prerequisites: (ART 101 with D- or better or WR 121 with C- or better) and ART 200 [D-] and ART 206 [D-]

ART 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ART 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ART 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ART 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ART 407. SEMINAR. (1-16 Credits)
Equivalent to: ART 407H
This course is repeatable for 16 credits.
Recommended: ART 206

ART 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 409. PRACTICUM STUDENT MEDIA. (1 Credit)
Practical workshop class offering experiential learning in student media on the Oregon State University campus.
Equivalent to: NMC 409
This course is repeatable for 12 credits.

ART 410. INTERNSHIP. (1-16 Credits)
A one-quarter residency with an appropriate, approved agency or organization where a student may receive practical experience related to the objectives of the Department of Art. The intern observes and produces; the work is supervised and evaluated, both by the agency and the art faculty.
This course is repeatable for 16 credits.

ART 411. *ART IN CONTEXT HISTORICAL AND CRITICAL APPROACHES. (3 Credits)
Seminar developing writing and research skills in the field of art with interdisciplinary approaches. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: Fine Arts Portfolio Review with a score of 1
Recommended: Art core curriculum plus 12 credits of upper-division studio credits.

ART 413. WOODTURNING WITH SCIENCE II. (4 Credits)
An in-depth look at how character in wood (figure, spalting, knots, etc.) affects machinability and output in both functional and aesthetic turning. Students will work with a wide range of spalted wood types and figure across numerous species while working on advanced turning forms. Particular emphasis will be placed upon how figure affects grain orientation, how spalting affects density and stability, and how the challenges with character wood can be overcome without specialty tools. Class instruction will be entirely studio based. CROSSLISTED as ART 413/WSE 413.
Prerequisites: WSE 210 with C- or better and WSE 211 [C-]
Equivalent to: WSE 413
This course is repeatable for 8 credits.

ART 414. ARTS MANAGEMENT. (3 Credits)
Survey of the theory and practice of managing an arts organization in an increasingly digital world. Includes managing diverse teams, interpersonal communication, cultural competence, and best practices in leadership, organizational planning, and conflict management.
ART 415. ART FOR TEACHERS I. (4 Credits)
A studio course covering basic art materials and techniques. Integrates aesthetics and art criticism, creating art, and the cultural and historical context of works of art for K-12. May be taken in any order.
Recommended: Fine Arts Portfolio Review (ART1) and Graphic Design Portfolio Review (ART2)

ART 416. ART FOR TEACHERS II. (4 Credits)
A studio course covering basic art materials and techniques. Integrates aesthetics and art criticism, creating art, and the cultural and historical context of works of art for K-12. May be taken in any order.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)

ART 418. PORTFOLIO SEMINAR. (2 Credits)
An advanced lecture course providing an overview of pertinent issues in creating a professional graphic design portfolio. Graded P/N.
Prerequisites: Graphic Design Portfolio Revie with a score of 1

ART 422. NEW MEDIA: INTERACTIVE. (4 Credits)
An advanced course designing digital experiences with emphasis on innovative navigation, architectural structures, theoretical, and historical issues of new media.
Prerequisites: Graphic Design Portfolio Revie with a score of 1

ART 431. DRAWING IV. (3-5 Credits)
Development of an individual approach to the varied aspects of drawing, emphasis on exploration of traditional and contemporary techniques and styles. Course offered 3 to 5 credits per term.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 15 credits.
Recommended: 9 credits of ART 331.

ART 432. *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/QS 532/WGSS 532. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 432, WGSS 432

ART 434. DRAWING IV/FIGURE. (3-5 Credits)
Development of an individual approach to the varied aspect of figure drawing; emphasis on exploration of traditional and contemporary techniques and styles. Course offered 3-5 credits per term; maximum 15 credits. Departmental approval required for 5 credits.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Revie with a score of 1)
This course is repeatable for 15 credits.
Recommended: 9 credits of ART 334.

ART 441. PHOTOGRAPHY III. (4 Credits)
Prerequisites: ART 341 with D- or better
This course is repeatable for 12 credits.

ART 443. COMBINED MEDIA: PHOTO INSTALLATION. (4 Credits)
This studio course explores the use the photographic image in conjunction with other studio media to create multi-media works and site-specific installations. Designed to remove and release the photographic image from its ubiquitous tradition, it looks to reassign the association of photography as merely a two dimensional pursuit. Emphasizing the relationship between objects, the course investigates installation art as a contemporary practice and focuses on the role photography or the photographic image has played in expanding this dialogue. Issues involved with using photography for the purposes of creating multimedia spatial experiences are discussed and compared with ideas related to traditional photographic presentation.
Prerequisites: ART 345 with C or better
This course is repeatable for 8 credits.
Recommended: Understanding of basic camera functions and competency using digital printing techniques

ART 444. THE CONSTRUCTED IMAGE. (4 Credits)
An advanced studio photography course that explores directed, manipulated, and constructed photographs. It investigates this rich tradition by looking at both historical and contemporary photography. Issues involved with making clearly artificial photographs are discussed and compared with traditional ideas related to veracity of the photographic image.
Prerequisites: ART 345 with C or better
Recommended: Pre-established foundation of technical camera operations and digital printing skills

ART 446. DOCUMENTARY PHOTOGRAPHY. (4 Credits)
Intensive in-depth documentary photography course designed to develop skill in telling stories with pictures. The course requires pitching a photographic project, reading and writing about documentary photography, and producing a sustained photographic essay with a self-selected documentary subject. Expanded documentary mediums and socially concerned photography are also covered. Hybrid Course.
Prerequisites: ART 263 with C or better and ART 345 [C-]
This course is repeatable for 12 credits.

ART 447. ADVANCED STUDIO LIGHTING. (4 Credits)
Practical studio course focusing on the advanced applications of studio and location lighting. Students will use digital cameras in combination with professional strobe and mixed artificial lighting. Real-world location lighting challenges will be mastered: scouting locations, hauling and setting up gear, working with models and products, and learning to work on-location.
Prerequisites: ART 263 with C or better and ART 347 [C]
This course is repeatable for 8 credits.

ART 451. INTRODUCTION TO ARTS ENTREPRENEURSHIP. (3 Credits)
Survey of the business strategies behind a successful career in the arts. Emphasizes the importance of entrepreneurial thinking, engages students with the fundamentals of the arts ‘business’, and explores ways to influence and shape the industry’s future. CROSSLISTED as ART 451/MUS 451/TA 451. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 451, TA 451

ART 454. ALTERNATIVE PROCESSES IN PHOTOGRAPHY II. (4 Credits)
Advanced projects using historical photographic processes.
Prerequisites: ART 354 with C- or better
This course is repeatable for 8 credits.
ART 455. THE PHOTOGRAPHIC BOOK II. (4 Credits)
Practical studio course focusing on advanced practices and techniques in relation to the photographic book. Use appropriated imagery as well as original imagery to complete well-developed book projects. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. Advanced elements such as application of blanking, slip cases, screen printing, and other construction techniques will be taught. CROSSLISTED as ART 455/GD 455.
Prerequisites: ART 355 with C- or better
Equivalent to: GD 455

ART 456. PORTFOLIO-PHOTOGRAPHY/VIDEO ART. (4 Credits)
Culmination-level course for the creation of an exhibition-level photographic portfolio or other artistic product using lens-based media. Taught using lectures, critiques, readings, writing and self-reflection. Prerequisites: ART 340 with C- or better and ART 345 [C-] and ART 347 [C-]
This course is repeatable for 12 credits.

ART 460. HISTORY OF AMERICAN ART. (3 Credits)
Specialized study of the visual arts in the United States focusing on such issues as landscape, mass culture, and American responses to European culture. Art and ideas from the colonial period to 1900. Not offered every year.
Recommended: 9 credits of art history and American literature or American history.

ART 461. HISTORY OF AMERICAN ART. (3 Credits)
Specialized study of the visual arts in the United States focusing on such issues as landscape, mass culture, and American responses to European culture. American modernism since 1900. Not offered every year.
Recommended: 9 credits of art history and American literature or American history.

ART 462. DIRECTIONS AND ISSUES IN CONTEMPORARY ART. (3 Credits)
Specialized study of current trends, developments, and critical issues, including the study of new media such as video and photography, as they manifest themselves in the contemporary art world. May be repeated with different topics. Not offered every year. This course is repeatable for 9 credits.
Recommended: 9 credits of art history

ART 463. TOPICS IN RENAISSANCE AND BAROQUE ART. (3 Credits)
Specialized study of selected areas of special interest, including such topics as Michelangelo, Leonardo da Vinci, Bernini, and art in the Medici’s Florence. Subject matter may vary year to year. Not offered every year. This course is repeatable for 6 credits.
Recommended: 9 credits of art history

ART 464. CULTURAL STUDIES OF THE MUSEUM. (3 Credits)
Overview of the history, visual culture, and cultural significance of the Western museum. Special attention paid to the development of the art museum and artist’s projects that pertain to museums. Recommended: 9 credits of art history

ART 468. HISTORY OF PRINTMAKING. (3 Credits)
Survey of the social, economic, intellectual, and technical history of printmaking between the early Middle Ages and the twentieth century in Asia, Europe, and the Americas. Treats the major printmaking processes of woodcut, intaglio, lithography, silkscreen, and photography.

ART 469. METHODS AND THEORY OF ART HISTORY. (3 Credits)
Seminar designed to improve writing and library skills, develop interdisciplinary approaches, and explore art historical theory from Plato to the present. Attributes: CWIC – Core, Skills, WIC
Recommended: 9 credits of art history

ART 475. PRINTMAKING STUDIO. (4 Credits)
Studio workshop in relief, intaglio, lithographic, and silkscreen media on an individual project basis. Course offered 4 credits per term; maximum 20 credits.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 271 [C-]
This course is repeatable for 20 credits.
Recommended: 8 credits of 300-level printmaking.

ART 479. PRINTMAKING: ADVANCED SCREEN PRINTING. (4 Credits)
Studio course in screen printing with an emphasis on photo emulsion processes. Students are encouraged to integrate these processes with other art-making methods in their creative work. Prerequisites: ART 379 with D- or better and (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Review with a score of 1) This course is repeatable for 12 credits.

ART 481. PAINTING III. (4 Credits)
Development of individual interests and directions in painting. Maximum 16 credits.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 131 [C-] and ART 281 [C-]
This course is repeatable for 16 credits.
Recommended: 12 credits of any combination of the following: ART 381, ART 382, ART 383, ART 384, ART 385.

ART 491. SCULPTURE III. (4 Credits)
Development of individual interests and directions in sculpture. Prerequisites: ART 391 with C- or better This course is repeatable for 24 credits.
Recommended: 12 credits of 300-level sculpture

ART 492. SPECIAL TOPICS IN ASIAN ART. (3 Credits)
Specialized study of selected areas of Asian art history such as Chinese calligraphy, Song Dynasty painting, and storytelling in Asian art. May be repeated with different topics. This course is repeatable for 99 credits.

ART 494. SPECIAL TOPICS IN EARLY ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 495. EXHIBITION DESIGN. (1 Credit)
Participatory experience in art gallery exhibition design working in Fairbanks Gallery. Includes specialized study in visual design, lighting, and technical installation. Course offered 1 credit per term, maximum 3 credits.
Prerequisites: (Fine Arts Portfolio Review with a score of 1 or Graphic Design Portfolio Review with a score of 1) This course is repeatable for 3 credits.

ART 496. SELECTED TOPICS IN MODERN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 497. SELECTED TOPICS IN GLOBAL ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 498. SPECIAL TOPICS IN ART HISTORY. (3 Credits)
This course is repeatable for 99 credits.

ART 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

ART 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ART 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
ART 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ART 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ART 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: ART 206

ART 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ART 510. INTERNSHIP. (1-12 Credits)
A one-quarter residency with an appropriate, approved agency or organization where a student may receive practical experience related to the objectives of the Department of Art. The intern observes and produces; the work is supervised and evaluated, both by the agency and the art faculty.
This course is repeatable for 15 credits.

ART 514. ARTS MANAGEMENT. (3 Credits)
Survey of the theory and practice of managing an arts organization in an increasingly digital world. Includes managing diverse teams, interpersonal communication, cultural competence, and best practices in leadership, organizational planning, and conflict management.

ART 515. ART FOR TEACHERS I. (4 Credits)
A studio course covering basic art materials and techniques. Integrates aesthetics and art criticism, creating art, and the cultural and historical context of works of art for K-12. May be taken in any order.

ART 516. ART FOR TEACHERS II. (4 Credits)
A studio course covering basic art materials and techniques. Integrates aesthetics and art criticism, creating art, and the cultural and historical context of works of art for K-12. May be taken in any order.

ART 532. GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women's, Gender and Sexuality Studies; Queer Studies and photography theory. Create written introduction to key concepts and intersections in Women's, Gender and Sexuality Studies; Queer Studies and photography theory. Create written introduction to key concepts and intersections in Women's, Gender and Sexuality Studies; Queer Studies and photography theory.

ART 546. DOCUMENTARY PHOTOGRAPHY. (3 Credits)
An intensive shooting course in 35mm photography designed to develop skill in telling stories using pictures. Single picture and multiple picture stories. Lec/lab.
This course is repeatable for 9 credits.
Recommended: ART 350

ART 556. PORTFOLIO-PHOTOGRAPHY/VIDEO ART. (4 Credits)
Culmination-level course for the creation of an exhibition-level photographic portfolio or other artistic product using lens-based media. Taught using lectures, critiques, readings, writing and self-reflection.
This course is repeatable for 12 credits.

ART 562. DIRECTIONS AND ISSUES IN CONTEMPORARY ART. (3 Credits)
Specialized study of current trends, developments, and critical issues, including the study of new media such as video and photography, as they manifest themselves in the contemporary art world. Not offered every year. May be repeated with different topics.
This course is repeatable for 9 credits.
Recommended: 9 credits of art history

ART 564. CULTURAL STUDIES OF THE MUSEUM. (3 Credits)
Overview of the history, visual culture, and cultural significance of the Western museum. Special attention paid to the development of the art museum and artist's projects that pertain to museums.
Recommended: 9 credits of art history

ART 569. METHODS AND THEORY OF ART HISTORY. (3 Credits)
Seminar designed to improve writing and library skills, develop interdisciplinary approaches, and explore art historical theory from Plato to the present.
Recommended: 9 credits of art history

ART 581. PAINTING III. (3-5 Credits)
Development of individual interests and directions in painting. Course offered 3 to 5 credits per term; maximum 15 credits.
This course is repeatable for 15 credits.
Recommended: 9 credits of 300-level painting

ART 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

Asian Languages and Culture (ASN)

ASN 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Atmospheric Sciences (ATS)

ATS 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity; and make and execute a plan for a project.

ATS 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

ATS 201. *CLIMATE SCIENCE. (4 Credits)
Physical laws governing the Earth’s climate and their interactions with chemical and biological processes on land and in the atmosphere, oceans, and cryosphere. Past, present, and potential future climate changes due to natural and human causes are assessed using a variety of observations, models, and laboratory exercises. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

ATS 295. OBSERVING CLIMATE. (3 Credits)
One-week course taught during Spring Break at field sites near Corvallis, with ten hours of preparatory meetings on campus. Make and analyze observations of properties of the atmosphere, ocean, biosphere, and cryosphere that reflect processes relevant to regional and global climate. Serves as an introduction to upper-division course work in climate science. Field trip(s) required; transportation fee charged. Lec/lab.
Prerequisites: ATS 201 with C- or better or ATS 320 with C- or better

ATS 301. CLIMATE DATA ANALYSIS. (4 Credits)
Quantitative methods to characterize the physical climate system and detect change. Interpret data based on source timescale, and statistics; communicate conclusions and uncertainties regarding past climate and future changes.
Prerequisites: ATS 201 with C- or better and ST 351 [C-]
ATS 302. MATHEMATICAL APPLICATIONS IN THE EARTH SCIENCES. (4 Credits)
An introductory survey of mathematical applications in climate science, meteorology, oceanography, geology, and geophysics. Topics may include conservation laws, harmonic motion, exponential growth/decay, linear approximations, numerical methods, waves, diffusion, fluid flow, systems of equations, inverse problems, and data analysis.
Prerequisites: MTH 252 with C- or better
Recommended: PH 201 or PH 211

ATS 310. METEOROLOGY. (4 Credits)
The study of the atmosphere, in particular atmospheric phenomena that we experience as weather. Key physical concepts in meteorology are introduced and explored. The physics of the atmosphere necessary to understand why atmospheric phenomena occur and how these are forecast is discussed. Meteorological data from observations and models will be analyzed to explore concepts introduced in the context of the weather we experience. Lec/Lab.
Prerequisites: (MTH 251 with C- or better or MTH 251H with C- or better) and (PH 201 [D-] or PH 201H [D-] or PH 211 [D-] or PH 211H [D-]) and (PH 202 (may be taken concurrently) [D-] or PH 202H (may be taken concurrently) [D-] or PH 212 (may be taken concurrently) [D-] or PH 212H (may be taken concurrently) [D-] or CH 121 (may be taken concurrently) [D-] or CH 231 (may be taken concurrently) [D-] or CH 231H (may be taken concurrently) [D-])

ATS 341. *SNOW, SMOKE, AND STORMS: CLIMATE CHANGE IMPACTS IN THE PNW. (3 Credits)
Climate change will alter mountain snowpack, water availability, coastal storms, erosion, and sea level in the Pacific Northwest. Increasing temperatures and changing precipitation patterns will lead to more extreme drought and flooding events, wildfire seasons, and insect and disease outbreaks in forests. These changes will impact the region's natural resource economy; heritage and quality of life; water, transportation, and energy infrastructure; and health and social systems. Case studies of past extreme years highlight the close interrelationships between the climate, the natural and built environment, and the health and well-being of the Pacific Northwest's residents.
Attributes: CSST – Core, Synthetic, Science/Technology/Society

ATS 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ATS 399H
This course is repeatable for 12 credits.

ATS 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ATS 399
This course is repeatable for 12 credits.

ATS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 403. THESIS. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ATS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 407. SEMINAR. (1 Credit)
One-credit sections. Graded P/N.
This course is repeatable for 12 credits.

ATS 408. WORKSHOP. (0-12 Credits)
May be repeated for credit when topic varies.
This course is repeatable for 12 credits.

ATS 410. INTERNSHIP. (1-12 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 48 credits.
Recommended: 12 credits of upper-division college courses

ATS 411. THERMODYNAMICS AND CLOUD MICROPHYSICS. (4 Credits)
Thermodynamic processes in the atmosphere, and an introduction to cloud microphysics. Offered annually.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and (PH 213 [D-] or PH 213H [D-])

ATS 412. ATMOSPHERIC RADIATION. (3 Credits)
Radiative transfer in the earth and planetary atmospheres, absorption and scattering of sunlight, absorption and emission of terrestrial radiation, absorption and scattering cross sections for molecules, cloud droplets and aerosols. Applications include enhancement of photochemical reaction rates in clouds, remote sensing, and the earth's radiation budget, radiative-convective equilibrium, radiative forcing due to changes in atmospheric composition and climate change.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and (MTH 256 [D-] or MTH 256H [D-]) and (PH 213 [D-] or PH 213H [D-])

ATS 413. ATMOSPHERIC CHEMISTRY. (3 Credits)
Principles of atmospheric chemistry; chemical fundamentals, sampling principles, sources, reactions, scavenging, and deposition of sulfur, nitrogen, ozone, and carbon compounds. Atmospheric aerosol size distribution, mechanics, optics, and scavenging. Offered annually.
Recommended: (CH 121 [D-] or CH 201 [D-] or CH 231 [D-] or CH 231H [D-]) and (MTH 251 [D-] or MTH 241 [D-])

ATS 415. ATMOSPHERIC DYNAMICS. (4 Credits)
Prerequisites: ATS 301 with C- or better and ATS 310 [C-] and (ATS 302 (may be taken concurrently) [C-] or MTH 254 (may be taken concurrently) [C-]) and (PH 202 (may be taken concurrently) [C-] or PH 212 (may be taken concurrently) [C-])

ATS 417. WEATHER SYSTEM DYNAMICS AND FORECASTING. (4 Credits)
Dynamics of weather systems and basic forecasting methods. Mid-latitude storm formation and structure; basic dynamical equations and applications to real-time weather; map analysis; description and interpretation of weather prediction models; forecasting methods; Pacific NW weather. Lec/Lab.
Prerequisites: ATS 310 with C- or better or ME 311 with C- or better or ME 311H with C- or better or BEE 311 with C- or better or CE 311 with C- or better

ATS 420. PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE. (4 Credits)
Physics of climate past, present and future. Covers radiative processes, thermodynamics, and dynamics, as well as the paleoclimate record and mechanisms driving this variability. Current modes of climate variability (e.g., ENSO) will also be surveyed. Climate models, ranging from 0- to 3-dimensional, will be examined and projections for the future assessed.
Recommended: MTH 252 and (PH 202 or PH 202H or PH 212 or PH 212H)
ATS 421. CLIMATE MODELING. (4 Credits)
Numerical models of the physics, chemistry, biology, and geology of the climate system. A range of climate models from a simple, single equation to complex state-of-the-science systems used for future projections. Theoretical concepts will be linked to practical applications through hands-on programming exercises and data analysis. Lec/lab.
Recommended: ATS 420 or ATS 520

ATS 441. NORTHWEST CLIMATE AND WEATHER. (4 Credits)
A survey of climate and weather phenomena that are consequential in the northwestern United States. The Pacific Ocean, the North Pacific jet and storm track, mountain and coastal meteorology, and topographic features like the region's mountains and Columbia River Gorge all affect the climate and weather of the Northwest, which in turn affect the region's hydrologic characteristics, vegetation, and numerous other natural and human systems. Preexisting content knowledge and analytical skills are used to produce a comprehensive written report and oral presentation for a regional stakeholder. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ATS 301 with C- or better and ATS 420 [C-]

ATS 475. PLANETARY ATMOSPHERES. (3 Credits)
Origin and evolution of planetary atmospheres; vertical structure of atmospheres; hazes and clouds; atmospheric motions and general circulation. Presentation of recent observations and current research issues, focusing on Venus, Earth, Mars, Jupiter, Saturn, and Titan. Emphasis on comparative aspects and simple models.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and (PH 213 [D-] or PH 213H [D-])

ATS 499. SPECIAL TOPICS. (0-4 Credits)
Equivalent to: ATS 499H
This course is repeatable for 12 credits.

ATS 501. RESEARCH. (1-16 Credits)
This course is repeatable for 24 credits.

ATS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ATS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ATS 506. PROJECTS. (1-16 Credits)
This course is repeatable for 72 credits.

ATS 507. SEMINAR. (1 Credit)
One-credit sections. Graded P/N.
This course is repeatable for 48 credits.

ATS 508. WORKSHOP. (0-12 Credits)
May be repeated when topic varies.
This course is repeatable for 12 credits.

ATS 511. THERMODYNAMICS AND CLOUD MICROPHYSICS. (4 Credits)
Thermodynamic processes in the atmosphere, and an introduction to cloud microphysics. Offered annually.
Recommended: MTH 254 and PH 213

ATS 512. ATMOSPHERIC RADIATION. (3 Credits)
Radiative transfer in the earth and planetary atmospheres, absorption and scattering of sunlight, radiation, absorption and emission of terrestrial absorption and scattering cross sections for molecules, cloud droplets and aerosols. Applications include enhancement of photochemical reaction rates in clouds, remote sensing, and the earth's radiation budget, radiative-convective equilibrium, radiative forcing due to changes in atmospheric composition and climate change.
Recommended: MTH 254 and MTH 256 and PH 213

ATS 513. ATMOSPHERIC CHEMISTRY. (3 Credits)
Principles of atmospheric chemistry; chemical fundamentals, sampling principles, sources, reactions, scavenging, and deposition of sulfur, nitrogen, ozone, and carbon compounds. Atmospheric aerosol size distribution, mechanics, optics, and scavenging. Offered annually.
Recommended: (CH 121 or CH 201 or CH 221 or CH 231 or CH 231H or CH 224) and (MTH 251 or MTH 241)

ATS 515. ATMOSPHERIC DYNAMICS. (4 Credits)
Prerequisites: OEAS 530 with C- or better
Recommended: One year of college calculus and physics

ATS 516. ATMOSPHERIC DYNAMICS II. (4 Credits)
Review of basic equations; scale analysis and approximations. Turbulence and boundary layers. Dry and moist convection; convective storms. Frontogenesis; symmetric instability; internal gravity waves and mountain waves; differentially heated circulations including sea breezes. Slope flows and urban circulations. Offered alternate years.
Prerequisites: ATS 515 with C or better

ATS 517. WEATHER SYSTEM DYNAMICS AND FORECASTING. (4 Credits)
Dynamics of weather systems and basic forecasting methods. Mid-latitude storm formation and structure; basic dynamical equations and applications to real-time weather; map analysis; description and interpretation of weather prediction models; forecasting methods; Pacific NW weather. Lec/Lab.
Prerequisites: OEAS 530 with C- or better

ATS 520. PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE. (4 Credits)
Physics of climate past, present and future. Covers radiative processes, thermodynamics, and dynamics, as well as the paleoclimate record and mechanisms driving this variability. Current models of climate variability (e.g., ENSO) will also be surveyed. Climate models, ranging from 0- to 3-dimensional, will be examined and projections for the future assessed.
Recommended: MTH 252 and (PH 202 or PH 202H or PH 212 or PH 212H)

ATS 521. CLIMATE MODELING. (4 Credits)
Numerical models of the physics, chemistry, biology, and geology of the climate system. A range of climate models from a single, simple equation to complex state-of-the-science systems used for future projections. Theoretical concepts will be linked to practical applications through hands-on programming exercises and data analysis. Lec/lab.
Recommended: ATS 420 or ATS 520

ATS 541. NORTHWEST CLIMATE AND WEATHER. (4 Credits)
A survey of climate and weather phenomena that are consequential in the northwestern United States. The Pacific Ocean, the North Pacific jet and storm track, mountain and coastal meteorology, and topographic features like the region's mountains and Columbia River Gorge all affect the climate and weather of the Northwest, which in turn affect the region's hydrologic characteristics, vegetation, and numerous other natural and human systems. Preexisting content knowledge and analytical skills are used to produce a comprehensive written report and oral presentation for a regional stakeholder.
Prerequisites: OEAS 530 with C- or better or ATS 520 with C- or better
ATS 546. EXPERIMENTAL ENERGY AND GAS EXCHANGE. (4 Credits)
Experimental methods to quantify the atmospheric carbon dioxide, water, methane, heat, momentum, and radiative exchange at the vegetation-land-ocean-air interface. Techniques include bulk and gradient approaches, and eddy covariance. The central activity consists of student teams designing and conducting a field experiment, analyzing and interpreting observations, and presenting results. Lec/lab/discussion/ activity.
Recommended: ATS 516 [D-] or ATS 564 [D-] or FS 564 [D-]

ATS 564. INTERACTIONS OF VEGETATION AND ATMOSPHERE. (3 Credits)
Quantitative treatment of radiation, heat, mass, and momentum exchange between vegetation and atmosphere; forest, natural and agricultural ecosystem examples. Physical and biological controls of carbon dioxide and water vapor exchange; remote sensing of canopy processes; models of stand-scale evaporation, photosynthesis and respiration; landscape and regional scale exchanges; vegetation and planetary boundary layer coupling; vegetation in global climate models.
Equivalent to: FS 564
Recommended: MTH 251 and PH 201

ATS 575. PLANETARY ATMOSPHERES. (3 Credits)
Origin and evolution of planetary atmospheres; vertical structure of atmospheres; hazes and clouds; atmospheric motions and general circulation. Presentation of recent observations and current research issues, focusing on Venus, Earth, Mars, Jupiter, Saturn, and Titan. Emphasis on comparative aspects and simple models.

ATS 590. SPECIAL TOPICS. (0-4 Credits)
May be repeated when topic varies. This course is repeatable for 12 credits.

ATS 601. RESEARCH. (1-16 Credits)
This course is repeatable for 36 credits.

ATS 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ATS 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ATS 606. PROJECTS. (1-16 Credits)
This course is repeatable for 84 credits.

ATS 607. SEMINAR. (1 Credit)
One-credit sections. Graded P/N. This course is repeatable for 48 credits.

ATS 608. WORKSHOP. (0-12 Credits)
May be repeated when topic varies. This course is repeatable for 12 credits.

ATS 615. LARGE-SCALE INTERACTIONS OF THE OCEAN AND ATMOSPHERE. (3 Credits)
Ocean-atmosphere circulations in the time-mean and seasonal cycles, equatorial wave modes, El Nino-Southern Oscillation, Madden-Julian oscillation, teleconnections and atmospheric bridges, mid-latitude air-sea interactions, Pacific and Atlantic decadal variability, the North Atlantic oscillation/Arctic oscillation.
Prerequisites: (ATS 515 with C or better or OC 670 with C or better)

ATS 690. SELECTED TOPICS. (0-4 Credits)
May be repeated for credit when topic varies. This course is repeatable for 12 credits.

Biochemistry and Biophysics (BB)

BB 100. THE MOLECULES OF LIFE. (2 Credits)
A brief introduction to molecular biology for nonspecialists. Subjects vary, but have included biochemical basis of the origin of life, biochemical genetics, biochemical aspects of memory and behavior, mutagenesis, bioenergetics and nutrition, and environmental biochemistry.
Equivalent to: BB 100H

BB 111. INTRODUCTION TO BIOCHEMISTRY AND BIOPHYSICS RESEARCH. (1 Credit)
Designed to introduce biochemistry and biophysics students to departmental research opportunities and advisors.

BB 211. PROFESSIONAL DEVELOPMENT II: MOLECULAR, MICROBIAL, BIOHEALTH. (1 Credit)
Develop awareness of the elements of professional development, identify strategic areas for growth, and design an exploration plan. Emphasis is placed on being able to analyze career opportunities to determine the best mix of technical and professional skills needed for success as a biological science professional. Graded P/N. CROSSTOISTED as BB 211/ BHS 211.
Equivalent to: BHS 211

BB 314. CELL AND MOLECULAR BIOLOGY. (4 Credits)
Fundamental concepts of prokaryotic and eukaryotic cell biology. Emphasizes cell structure and function at the molecular level. Lec/rec.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 331 (may be taken concurrently) [C-] or CH 334 (may be taken concurrently) [C-])
Equivalent to: BB 314H, BI 314, BI 314H

BB 314H. CELL AND MOLECULAR BIOLOGY. (4 Credits)
Fundamental concepts of prokaryotic and eukaryotic cell biology. Emphasizes cell structure and function at the molecular level. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 331 (may be taken concurrently) [C-] or CH 334 (may be taken concurrently) [C-])
Equivalent to: BB 314, BI 314, BI 314H

BB 315. MOLECULAR BIOLOGY LABORATORY. (3 Credits)
Laboratory projects exploring the transmission of genetic information from storage to function will introduce students to fundamental molecular biology concepts and techniques, including isolation of DNA, construction of recombinant plasmids, quantification of gene expression in model organisms, polymerase chain reaction, and analysis of protein expression and subcellular localization. Lec/lab. CROSSTOISTED as BB 315/BI 315.
Prerequisites: BB 314 with C- or better or BB 314H with C- or better
Equivalent to: BI 315

BB 317. *SCIENTIFIC THEORY AND PRACTICE. (3 Credits)
Teaches students the practice of biological science. Topics cover scientific theory, communications, ethics and critical evaluation. CROSSTOISTED as BB 317/BI 317. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-])
Equivalent to: BI 317
BB 331. *INTRODUCTION TO MOLECULAR BIOLOGY. (3 Credits)
Course dealing with the molecular basis of cellular function, with emphasis upon modern developments, and the foundation for practical applications of this knowledge. The course will involve the conceptual background necessary to appreciate the applications of molecular biology. Throughout the course opportunities will be given to discuss public policy issues and questions: What are the moral and practical problems that flow from identification of an individual as being at risk for a late-appearing genetic disorder, such as Huntington's disease or certain cancers? Does the scientific or public value of knowing the entire DNA sequence of the human genome justify a situation in which individual or small-scale research cannot be supported? What issues arise when the fruits of biological research, mostly publicly funded, are commercialized? Should a novel organism be patented? How can biotechnology be applied to environmental problems? (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: CH 122 with D- or better or CH 202 with D- or better or CH 222 with D- or better or CH 225H with D- or better or (CH 232 with D- or better or CH 232H with D- or better) or (CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better))

BB 332. *MOLECULAR MEDICINE. (3 Credits)
Provides students an understanding of medical advances from a rapidly evolving molecular point of view. Advances in knowledge of the human genome arising from DNA sequencing efforts and major leaps in understanding of the regulating cellular growth and division are presented in an easy-to-understand fashion appropriate for students in all majors. Course discussions and assignments will cover implications of advances in molecular medicine from ethical, economic, technical and societal standpoints. The aim of the course is to present technical material in a way that non-scientists will understand and conversely to summarize ethical, economic, and philosophical considerations in a way that the scientists understand the implications of these technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Any biology course.

BB 345. INTRODUCTION TO BIOLOGICAL SEQUENCE ANALYSIS. (2 Credits)
Introduction to computer-based analyses of biomolecular data, particularly nucleic acid and protein sequences, with the Python programming language. Topics include reading and writing of sequence files, subsequences, reverse complement, finding sequence patterns, subroutines, control structures, and parsing complex data files.

BB 350. ELEMENTARY BIOCHEMISTRY. (4 Credits)
Service course for students desiring a short introduction to biochemistry. Four lectures weekly.
Prerequisites: CH 331 with D- or better and CH 332 (may be taken concurrently) [D-]

BB 360. INTRODUCTION TO NEUROSCIENCE. (3 Credits)
An introduction to the field of neuroscience. Topics include structure of neurons, outline of signaling in the central nervous system, Neuron equation, action potentials, synaptic transmission, chemical signaling in vision, disease and drugs.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-])

BB 361. NEUROSCIENCE OF SENSORY AND MOTOR SYSTEMS. (3 Credits)
Provides advanced knowledge and understanding of the structure and function of the sensory and motor systems and the interactions between them. These systems will be considered in the context of human physiology.
Prerequisites: BB 360 with C- or better

BB 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: BB 399H
This course is repeatable for 16 credits.

BB 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 399
This course is repeatable for 16 credits.

BB 401. UNDERGRADUATE RESEARCH. (1-16 Credits)
Equivalent to: BB 401H
This course is repeatable for 16 credits.

BB 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BB 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BB 405H
This course is repeatable for 16 credits.

BB 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 405
This course is repeatable for 16 credits.

BB 407. BIOCHEMISTRY/BIOPHYSICS SEMINAR. (1-16 Credits)
Informal seminars presenting information about research problems and careers and research programs on campus in biochemistry or biophysics. Graded P/N.
Equivalent to: BB 407H
This course is repeatable for 99 credits.

BB 407H. BIOCHEMISTRY/BIOPHYSICS SEMINAR. (1-16 Credits)
Informal seminars presenting information about research problems and careers and research programs on campus in biochemistry or biophysics.
Attributes: HNRS – Honors Course Designator
Equivalent to: BB 407
This course is repeatable for 99 credits.

BB 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

BB 450. GENERAL BIOCHEMISTRY. (4 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551, three lectures.
Prerequisites: CH 332 with D- or better or CH 336 with D- or better
Equivalent to: BB 450H

BB 451. GENERAL BIOCHEMISTRY. (3 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551, three lectures.
Prerequisites: BB 450 with D- or better or BB 450H with D- or better
Equivalent to: BB 451H
BB 460. ADVANCED CELL BIOLOGY. (3 Credits)
History and theory of cell biology; microscopy and other techniques to study cells and organelles; membranes; organelles; protein import; cell signaling; cytoskeleton; polarity; cell cycle; stem cells; pattern formation; cancer biology. Offered every other fall in odd years.
Prerequisites: BB 314 with C- or better or BI 314 with C- or better or BI 314H with C- or better or BB 451 with C- or better or BB 492 with C- or better

BB 481. MACROMOLECULAR STRUCTURE. (3 Credits)
An introduction to structural biology, the discipline focused on understanding the structural properties of biological macromolecules—especially proteins and nucleic acids—and relating them to their function. Introduces students to the vocabulary and tools of this discipline, covering both the fundamental physico-chemical principles governing the structure and function of biological macromolecules and a selected set of widely used experimental and theoretical approaches to their characterization. This is done through lectures, and textbook and literature readings. Graduate students receive additional experience in scientific reading, writing and presentation through a literature-based term project.
Prerequisites: BB 450 with D- or better or BB 490 with D- or better

BB 482. BIOPHYSICS. (3 Credits)
Sequence professional course covering quantitative properties of biological systems and biological phenomena using concepts derived from mathematics and physics.
Prerequisites: BB 481 with D- or better and CH 442 [D]

BB 483. ADVANCED BIOCHEMISTRY AND BIOPHYSICS: CAPSTONE. (3 Credits)
Covers applications of advanced biophysical techniques, and how these fit within the larger context of biochemistry, biology and society. Explores techniques and their applications to macromolecules as well as the scientific process. Techniques discussed include in vitro, in vivo, and in silico methods, with an emphasis on biomolecular interactions.
Prerequisites: BB 482 with D- or better or BB 582 with D- or better

BB 484. CHROMATIN AND EPIGENETICS. (3 Credits)
An in-depth look at 'chromatin' (the complex generated by DNA, RNA and complex protein) and how it behaves during gene activation and silencing. Specific examples of long-lasting gene regulation (across cell cycles) will be used to describe the concept of 'epigenetic' gene regulation by modification of DNA or proteins. The class will combine more traditional lectures with discussion periods where primary research papers will be analyzed. The target audience is third- and fourth-year students as well as graduate students.
Prerequisites: (BB 314 with C- or better or BI 314H with C- or better or BB 314 with C- or better or BB 314H with C- or better) and (BI 315 [C-] or BB 315 [C-] or BB 493 [C-] or BB 493H [C-])

BB 485. APPLIED BIOINFORMATICS. (3 Credits)
Fundamental concepts needed to understand the software and methods used in bioinformatics. Includes contemporary techniques such as databases, gene and genome annotations, functional annotations, sequence alignment, motif finding, secondary structure prediction, phylogenetic tree construction, high-throughput sequence data, ChIP-Seq peak identification, transcriptome profiling by RNA-Seq, microRNA discovery and target prediction.
Prerequisites: BB 314 with C- or better or BB 314H with C- or better

BB 486. ADVANCED MOLECULAR GENETICS. (3 Credits)
Covers aspects of transmission genetics (Mendel's laws, mapping strategies) informed by the machineries required for genetic information storage, transcription, translation, and protein processing. Analyses of state-of-the-art primary literature and lectures give a perspective on important "model" organisms, including examples from among bacteria, plants, fungi, and animals.
Prerequisites: (BB 314 with C- or better or BB 314H with C- or better) and (BB 492 [C-] or BB 451 [C-])

BB 490. BIOCHEMISTRY 1: STRUCTURE AND FUNCTION. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The first course in the series, BB 490/BB 590, covers how the structure and function of biological macromolecules arises from the organic chemistry of their fundamental building blocks. The organic chemistry of biochemistry will be a focus, including the mechanisms by which enzymes catalyze biological reactions.
Prerequisites: CH 332 with C- or better or CH 336 with C- or better

BB 491. BIOCHEMISTRY 2: METABOLISM. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The second course in a series, BB 491/BB 591 covers the mechanisms and regulation of the pathways by which cells break down fuel molecules, conserve some of the released energy in the form of reactive nucleotides, and use this energy to create biological building blocks from simpler metabolites.
Prerequisites: BB 490 with D- or better or BB 590 with D- or better

BB 492. BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The third course in the series, BB 492/BB 592 focuses on genetic biochemistry, including the synthesis of nucleotides, DNA synthesis and repair, RNA synthesis and processing, and protein synthesis and modification.
Prerequisites: (BB 490 with D- or better or BB 590 with D- or better) and (BB 491 [D-] or BB 591 [D-])

BB 493. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1. (3 Credits)
Laboratory course to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Prerequisites: (BB 451 with D- or better or BB 451H with D- or better) or BB 492 with D- or better
Equivalent to: BB 493H

BB 494. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2. (3 Credits)
Laboratory course to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Prerequisites: BB 493 with D- or better or BB 593 with D- or better or BB 315 with D- or better or BI 315 with D- or better
Equivalent to: BB 494H

BB 498. ASBMB CERTIFICATION EXAM. (0 Credits)
A comprehensive, standardized test administered by the American Society of Biochemistry and Molecular Biology and used as a direct assessment of the discipline specific knowledge of seniors in the majors administered by the Biochemistry and Biophysics department. A pass will be given to all students who complete the exam. Contact the Biochemistry and Biophysics Program for more information.

BB 499. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
This course is repeatable for 16 credits.
BB 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BB 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BB 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BB 507. SEMINAR. (1-2 Credits)
Section 1: Descriptions of campus research programs in biochemistry and biophysics, 1 credit fall. Graded P/N. Student presentations of current research literature, 1 credit winter and spring. Should be taken by all entering departmental graduate students. Section 2: Presentation of departmental research seminar, 2 credits any term. PhD candidates in biochemistry and biophysics present a departmental research seminar in the third or fourth year. One registers in the term the seminar is presented.
This course is repeatable for 16 credits.

BB 550. GENERAL BIOCHEMISTRY. (4 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551 and BB 452, three lectures.
Recommended: CH 332

BB 551. GENERAL BIOCHEMISTRY. (3 Credits)
Sequence course for students with a limited background in physical chemistry. BB 450/BB 550, three lectures and one recitation. BB 451/BB 551 and BB 452, three lectures.
Recommended: BB 550

BB 560. ADVANCED CELL BIOLOGY. (3 Credits)
History and theory of cell biology; microscopy and other techniques to study cells and organelles; membranes; organelles; protein import; cell signaling; cytoskeleton; polarity; cell cycle; stem cells; pattern formation; cancer biology.
Recommended: BB 314 or BI 314 or BI 314H or BB 492 or BB 451

BB 581. MACROMOLECULAR STRUCTURE. (3 Credits)
An introduction to structural biology, the discipline focused on understanding the structural properties of biological macromolecules—especially proteins and nucleic acids—and relating them to their function. Introduces students to the vocabulary and tools of this discipline, covering both the fundamental physico-chemical principles governing the structure and function of biological macromolecules and a selected set of widely used experimental and theoretical approaches to their characterization. This is done through lectures, and textbook and literature readings. Graduate students receive additional experience in scientific reading, writing and presentation through a literature-based term project.
Recommended: BB 450 or BB 490

BB 582. BIOPHYSICS. (3 Credits)
Sequence professional course covering quantitative properties of biological systems and biological phenomena using concepts derived from mathematics and physics.
Prerequisites: BB 581 with C or better
Recommended: CH 442

BB 583. ADVANCED BIOCHEMISTRY AND BIOPHYSICS: CAPSTONE. (3 Credits)
Covers applications of advanced biophysical techniques, and how these fit within the larger context of biochemistry, biology and society. Explores techniques and their applications to macromolecules as well as the scientific process. Techniques discussed include in vitro, in vivo, and in silico methods, with an emphasis on biomolecular interactions.
Prerequisites: BB 582 with C or better

BB 584. CHROMATIN AND EPIGENETICS. (3 Credits)
An in-depth look at ‘chromatin’ (the complex generated by DNA, RNA and complex protein) and how it behaves during gene activation and silencing. Specific examples of long-lasting gene regulation (across cell cycles) will be used to describe the concept of ‘epigenetic’ gene regulation by modification of DNA or proteins. The class will combine more traditional lectures with discussion periods where primary research papers will be analyzed. The target audience is third- and fourth-year students as well as graduate students.
Recommended: (BI 314 or BI 314H) and BI 315

BB 585. APPLIED BIOINFORMATICS. (3 Credits)
Fundamental concepts needed to understand the software and methods used in bioinformatics. Includes contemporary techniques such as databases, gene and genome annotations, functional annotations, sequence alignment, motif finding, secondary structure prediction, phylogenetic tree construction, high-throughput sequence data, ChiP-Seq peak identification, transcriptome profiling by RNA-Seq, microRNA discovery and target prediction.
Recommended: BB 314 or BB 314H

BB 586. ADVANCED MOLECULAR GENETICS. (3 Credits)
Covers aspects of transmission genetics (Mendel’s laws, mapping strategies) informed by the machineries required for genetic information storage, transcription, translation, and protein processing. Analyses of state-of-the-art primary literature and lectures give a perspective on important “model” organisms, including examples from among bacteria, plants, fungi, and animals.
Recommended: (BI 314 or BI 314H) and BI 315 and BB 492

BB 590. BIOCHEMISTRY 1: STRUCTURE AND FUNCTION. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The first course in the series, BB 490/BB 590, covers how the structure and function of biological macromolecules arises from the organic chemistry of their fundamental building blocks. The organic chemistry of biochemistry will be a focus, including the mechanisms by which enzymes catalyze biological reactions.
Recommended: CH 332 or CH 336

BB 591. BIOCHEMISTRY 2: METABOLISM. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The second course in the series, BB 491/BB 591 covers the mechanisms and regulation of the pathways by which cells break down fuel molecules, conserve some of the released energy in the form of reactive nucleotides, and use this energy to create biological building blocks from simpler metabolites.
Prerequisites: BB 590 with C or better

BB 592. BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY. (3 Credits)
Sequence professional course to meet the requirements of majors in biochemistry and biophysics. The third course in the series, BB 492/BB 592 focuses on genetic biochemistry, including the synthesis of nucleotides, DNA synthesis and repair, RNA synthesis and processing, and protein synthesis and modification.
Prerequisites: BB 590 with C or better and BB 591 [C]
BB 593. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1. (3 Credits)
Laboratory course to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Recommended: (BB 451 or BB 451H) or BB 492

BB 594. BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2. (3 Credits)
Laboratory to accompany BB 450, BB 451 or BB 490, BB 491, BB 492. Lec/lab.
Recommended: BB 493 or BB 593 or BB 315 or BI 315

BB 599. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
This course is repeatable for 16 credits.

BB 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BB 605. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BB 607. SEMINAR. (1-2 Credits)
Section 1: Descriptions of campus research programs in biochemistry and biophysics, 1 credit fall. Graded P/N. Student presentations of current research literature, 1 credit winter and spring. Should be taken by all entering departmental graduate students. Section 2: Presentation of departmental research seminar, 2 credits any term. PhD candidates in biochemistry and biophysics present a departmental research seminar in the third or fourth year. One registers in the term the seminar is presented.
This course is repeatable for 16 credits.

BB 650. SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS. (3 Credits)
Nonsequence courses designed to acquaint student with current research in biochemistry and biophysics. Courses include enzyme kinetics, cell cycle and cancer, neurochemistry, oxidative stress, cell adhesion and motility. Most courses offered alternate years.
This course is repeatable for 18 credits.

BB 651. SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS. (3 Credits)
Nonsequence courses designed to acquaint student with current research in biochemistry and biophysics. Courses include cell surfaces, enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.
This course is repeatable for 18 credits.

BB 652. SELECTED TOPICS IN BIOCHEMISTRY AND BIOPHYSICS. (3 Credits)
Nonsequence courses designed to acquaint student with current research in biochemistry and biophysics. Courses include enzyme kinetics, metabolism, neurochemistry, trace element metabolism, biological oxidations, and bioenergetics. Most courses offered alternate years.
This course is repeatable for 18 credits.

BB 699. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

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**BioHealth Sciences (BHS)**

**BHS 107. HEALTH PROFESSIONS: DENTAL. (1 Credit)**
Discussion of matters relating to a dental career. Includes application procedures, the importance of various requirements, admissions, professional school curricula, financing education and related matters. Speakers are included. Graded P/N.

**BHS 110. BIOHEALTH SCIENCES ORIENTATION. (1 Credit)**
Introduction of incoming BioHealth Sciences students to college life with an emphasis on faculties, facilities, services, and curricula in BHS. Exposure to career opportunities for students interested in the BioHealth Sciences. Graded P/N.

**BHS 199. SPECIAL TOPICS. (1-16 Credits)**
Graded P/N.
Equivalent to: GS 199
This course is repeatable for 16 credits.

**BHS 211. PROFESSIONAL DEVELOPMENT II: MOLECULAR, MICROBIAL, BIOHEALTH. (1 Credit)**
Develop awareness of the elements of professional development, identify strategic areas for growth, and design an exploration plan. Emphasis is placed on being able to analyze career opportunities to determine the best mix of technical and professional skills needed for success as a biological science professional. Graded P/N. CROSSTLISTED as BB 211/ BHS 211.
Equivalent to: BB 211

**BHS 255. *ALLIED HEALTH MICROBIOLOGY. (4 Credits)**
General properties of cellular microbes and viruses, microbial biochemistry and genetics, pathogenesis and disease, immunity, and microbial infections. Lecture and lab emphasis is on medical microbiology, infectious diseases, and public health. Not intended for biological sciences majors. Lec/lab. CROSSTLISTED as BHS 255/MB 255.
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: MB 255

**BHS 316. PRINCIPLES OF IMMUNOLOGY. (3 Credits)**
Interactions of the innate and adaptive immune responses in the context of infectious diseases, autoimmune diseases, immunodeficiencies and immunotherapies. This course is designed for non-microbiology majors.
Prerequisites: MB 230 with C- or better or ((BI 212 with C- or better or BI 212H with C- or better) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-])

**BHS 320. HUMAN BACTERIOLOGY. (4 Credits)**
Properties of bacteria, their biology, pathogenesis and concern to society. Emphasis on the role of bacteria in human health and disease.
CROSSTLISTED as BHS 320/MB 320.
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or (BI 211 [C-] and (BI 213 [C-])) or (BI 204 [C-] and BI 205 [C-])

**BHS 323. *MICROBIAL INFLUENCES ON HUMAN HEALTH. (3 Credits)**
How microorganisms contribute in beneficial and detrimental ways to human health. Emphasis on microbial contributions to cancer, gut health, chronic infection and autoimmune diseases. This course is part of the Writing Intensive Curriculum for the BioHealth Sciences major. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MB 302 with D- or better or (BB 314 with D- or better or BB 314H with D- or better) or BB 450 with D- or better
BHS 329. MECHANISMS OF DISEASE: INTRODUCTION TO GENERAL PATHOLOGY. (3 Credits)
An introduction to basic principles of disease, focused on structural and functional changes of cells, tissues and organs, and their relationships to clinical disease. The emphasis of the course is at the cellular to organ level, but will cover some on molecular mechanisms as pertinent.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-])

BHS 340. HUMAN VIROLOGY. (4 Credits)
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or (BI 211 [C-] and BI 212 [C-] and BI 213 [C-])
Equivalent to: MB 340

BHS 401. RESEARCH. (1-16 Credits)
Equivalent to: GS 401
This course is repeatable for 16 credits.

BHS 403. THESIS. (1-16 Credits)
Equivalent to: GS 403
This course is repeatable for 16 credits.

BHS 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: GS 405
This course is repeatable for 16 credits.

BHS 406. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BHS 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: GS 407
This course is repeatable for 16 credits.

BHS 410. SCIENCE INTERNSHIP. (1-12 Credits)
Supervised scientific work experience at selected cooperating institutions, agencies, laboratories, or companies. Graded P/N.
Equivalent to: GS 410
This course is repeatable for 12 credits.

BHS 415. ONE HEALTH IN PRACTICE. (3 Credits)
One health is the concept that human, animal and environmental health are all intertwined. Utilizes current one health issues such as disease outbreaks and antimicrobial resistance to encourage students from diverse fields to develop interdisciplinary collaboration and communication skills. CROSSLISTED as BHS 415/VMB 415.
Equivalent to: VMB 415
Recommended: At least third-year standing.

BHS 499. SPECIAL TOPICS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BEE 101. ECOLOGICAL ENGINEERING I. (3 Credits)
Introduction to engineering at OSU and the field of ecological engineering. Topics include engineering analysis and problem solving, professional ethics, the design process and teamwork.
Recommended: MTH 112

BEE 102. ECOLOGICAL ENGINEERING II. (3 Credits)
Introduction to common problems and solutions in ecological engineering, emphasizing the multiplicity of approaches to constraining, analyzing, and resolving challenges of ecosystem management. Two overnight field trips to local ecological monitoring and engineering sites will be required.

BEE 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BEE 221. FUNDAMENTALS OF ECOLOGICAL ENGINEERING. (3 Credits)
Introduction to the concepts and practice of ecological engineering including characteristics, classification, and modeling of ecosystems; ecosystem protection; and sustainable uses of ecosystems, including treatment wetlands, land treatment systems, and ecologically sensitive stormwater management, to meet the needs of human societies.
Prerequisites: (BI 211 with C or better or BI 211H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: BEE 321

BEE 222. ECOLOGICAL ENGINEERING COMPUTATION. (3 Credits)
Programming methods relevant to ecological engineering, including hardware/software integration.

BEE 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BEE 311. ECOLOGICAL FLUID MECHANICS. (4 Credits)
Fluid properties, fluid statics, fluid motion, conservation of mass, momentum and energy for incompressible fluids, dimensional analysis, ecological engineering applications. Lec/rec.
Prerequisites: (PH 212 with C or better or PH 212H with C or better) and (MTH 254 [C] or MTH 254H [C]) and (ENGR 211 [C] or ENGR 211H [C])

BEE 312. ECOHYDRAULICS. (4 Credits)
Theory and design of hydraulic systems for ecological engineering applications. Lec/rec.
Prerequisites: BEE 311 with C or better or CE 311 with C or better or CHE 331 with C or better or CHE 331H with C or better

BEE 313. ECOHYDROLOGY. (4 Credits)
Provides quantitative description of fundamental hydrologic processes and the hydrologic cycle, the interactions of water between atmosphere, soils, and plants, and models for estimating the generation and transport of water in the environment. Lec/rec.
Prerequisites: BEE 312 with C or better

BEE 320. BIOSYSTEMS ANALYSIS AND MODELING. (4 Credits)
An introduction to simulation modeling and analysis of a variety of biological and ecological systems. Systems approaches to describing ecological systems.
Prerequisites: BEE 222 with C or better and (MTH 256 [C] or MTH 256H [C])
Recommended: MTH 256

BEE 322. ECOLOGICAL ENGINEERING THERMODYNAMICS AND TRANSFER PROCESS. (4 Credits)
A study of the transport processes of fluid flow, heat transfer and mass transfer applied to biological organisms and ecological systems.
Prerequisites: BEE 320 with C or better

BEE 361. ECOLOGICAL ENGINEERING LABORATORY. (3 Credits)
Introduction to modern measurement methods for ecological and environmental applications includes sensors and systems for measuring soil, water and atmospheric properties. No final exam; field trip required.
Lec/lab.
Prerequisites: BEE 312 with C or better
BEE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

BEE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BEE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BRE 405
This course is repeatable for 16 credits.

BEE 407. SEMINAR. (1-16 Credits)
Departmental seminars. Graded P/N.
Equivalent to: BEE 407H, BRE 407
This course is repeatable for 16 credits.

BEE 407H. SEMINAR. (1-16 Credits)
Departmental seminars. Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BEE 407
This course is repeatable for 16 credits.

BEE 410. ECOLOGICAL ENGINEERING INTERNSHIP. (1-12 Credits)
Internship in ecological engineering to provide students with an opportunity to apply course work and theory to the real world. Requires internship opportunity identification by student.
This course is repeatable for 12 credits.

BEE 411. GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS. (3 Credits)
Empowers students interested in global change research to focus on the interactions between changes in human land use and climate. Using an innovative online data and mapping tool called Data Basin, students will explore topics accessing the highest quality datasets available in an all-in-one platform.
Prerequisites: FE 257 with C or better

BEE 415. PROFESSIONAL DEVELOPMENT. (1 Credit)
Preparation for student professional careers. Students will interact with and hear seminars from professionals working in the ecological engineering field to learn from their experiences.
Corequisites: BEE 469

BEE 433. IRRIGATION SYSTEM DESIGN. (4 Credits)
Principles of soil physics and plant water use applied to irrigation system design. Design of gravity, pressurized, and trickle irrigation systems, improving on-farm water management, performance characteristics of pumps and other irrigation equipment. Lec/lab. Offered alternate years.
Prerequisites: BEE 312 with C or better or CE 313 with C or better
Equivalent to: BRE 433

BEE 438. ECOLOGICAL SYSTEMS ANALYSIS. (4 Credits)
An introduction to sustainability with a focus on case studies that are relevant to biological and ecological engineers. An introduction to tools that perform technical feasibility analysis, economic viability analysis, environmental risk assessment, resource sustainability assessment and life cycle assessment (LCA). Course will consist of theory and case studies highlighting the use of LCA methods to assess sustainability.
Prerequisites: ENGR 391 with C or better or ENGR 391H with C or better

BEE 439. IRRIGATION PRINCIPLES AND PRACTICES. (4 Credits)
Survey of irrigation systems, system configurations, factors that influence irrigation efficiency, crop water requirements, energy requirements, pumps, irrigation scheduling. For non-engineers. Lec/lab/rec.
Prerequisites: MTH 111 with C or better
Equivalent to: BRE 439

BEE 446. RIVER ENGINEERING. (4 Credits)
Multipurpose river use; natural physical processes in alluvial rivers; channel modification practices; river structures; design practices; impact of river modification; problem analysis; and impact minimization. Offered alternate years.
Prerequisites: BEE 312 with C or better or CE 313 with C or better
Recommended: CE 313

BEE 458. NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL. (3 Credits)
Problem solving in nonpoint source pollution. Methods for evaluating the extent, rate, timing, and fate of Non-Point Source (NPS) pollutants in agricultural and urban environments.
Prerequisites: BEE 313 with C or better or CE 412 with C or better

BEE 468. BIOREMEDIATION ENGINEERING. (4 Credits)
Examines strategies for using a variety of biological processes for treating municipal, agricultural and industrial contaminants. Lec/lab.
Prerequisites: BEE 221 with C or better or ENVE 322 with C or better

BEE 469. ECOLOGICAL ENGINEERING DESIGN I. (4 Credits)
Engineering design processes for ecological engineering applications, including specifications, performance criteria, timelines, and project logistics, principles and practices of working in engineering teams. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: BEE 322 with C or better
Recommended: ENGR 391 or ENGR 391H

BEE 470. ECOLOGICAL ENGINEERING DESIGN II. (4 Credits)
Engineering design processes for ecological engineering applications, including specifications, performance criteria, timelines, and project logistics, principles and practices of working in engineering teams.
Prerequisites: BEE 469 with C or better

BEE 472. INTRODUCTION TO FOOD ENGINEERING PRINCIPLES. (5 Credits)
Fundamental engineering principles for scientists and non-process engineers. Topics include fluid flow, mass and energy transfer, and material and energy balances. Directed at food scientists and other majors who need or would like a working knowledge of food engineering principles.
Prerequisites: MTH 112 with C- or better and (MTH 227 [C-] or MTH 251 [C-] or MTH 251H [C-]) and PH 201 [C-]
Equivalent to: BEE 452

BEE 473. INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN. (3 Credits)
Fundamental engineering process design principles for food scientists and non-process engineers. Directed at those who need or would like a working knowledge of applied food engineering process design. Lec/rec.
Equivalent to: BEE 453
Recommended: BEE 472 or BEE 572

BEE 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BEE 499H, BRE 499
This course is repeatable for 16 credits.

BEE 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BEE 499
This course is repeatable for 16 credits.

BEE 501. RESEARCH. (1-16 Credits)
Equivalent to: BRE 501
This course is repeatable for 16 credits.
BEE 503. THESIS. (1-16 Credits)
Equivalent to: BRE 503
This course is repeatable for 99 credits.

BEE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BRE 505
This course is repeatable for 16 credits.

BEE 506. PROJECTS. (1-16 Credits)
Equivalent to: BRE 506
This course is repeatable for 16 credits.

BEE 507. SEMINAR. (1 Credit)
Section 1: Graduate Student Orientation Seminar to acquaint new graduate students with graduate school and departmental requirements, policies and expectations, and departmental research programs.
Section 2: Graduate Research Publication Seminar to expose students to requirements for successful proposals and publication of research results. Section 3: Oral Presentation Improvement—A highly participatory educational effort designed to improve performance in presenting research reports, technical papers and in responding to oral examination questions. Graded P/N.
Equivalent to: BRE 507
This course is repeatable for 99 credits.

BEE 511. GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS. (3 Credits)
Empowers students interested in global change research to focus on the interactions between changes in human land use and climate. Using an innovative online data and mapping tool called Data Basin, students will explore topics accessing the highest quality datasets available in an all-in-one platform.
Equivalent to: BRE 512
Recommended: One year of calculus.

BEE 512. PHYSICAL HYDROLOGY. (3 Credits)
Principles of hydrologic processes and the integration of these processes into the hydrologic cycle. Topics include atmospheric processes, precipitation and runoff, storm response in streamflow on a watershed scale, and major concepts in groundwater systems.
Equivalent to: BRE 512
Recommended: CE 513 or FE 330

BEE 522. DATA ANALYSIS AND VISUALIZATION USING PYTHON. (3 Credits)
Foundation course in computational thinking and computational skills relevant to data analysis and visualization of environmental data.

BEE 525. STOCHASTIC HYDROLOGY. (3 Credits)
Introduction to fundamental concepts that are needed for stochastic modeling of hydrologic processes in presence of nonstationarity and uncertainty. CROSSTLISTED as BEE 525/CE 525.
Prerequisites: CE 512 with C or better or BEE 512 with C or better
Equivalent to: CE 525

BEE 529. BIOSYS MODELING TECHNIQUES. (3 Credits)
Development of mathematical models of biological and ecological systems; linear and nonlinear systems analysis; stochastic modeling and random processes; model solution and analysis techniques.

BEE 533. IRRIGATION SYSTEM DESIGN. (4 Credits)
Principles of soil and plant water use applied to irrigation system design. Design of gravity, pressurized, and trickle irrigation systems, improving on-farm water management, performance characteristics of pumps and other irrigation equipment. Lec/lab. Offered alternate years.
Equivalent to: BRE 533
Recommended: ENGR 332

BEE 538. ECOLOGICAL SYSTEMS ANALYSIS. (4 Credits)
An introduction to sustainability with a focus on case studies that are relevant to biological and ecological engineers. An introduction to tools that perform technical feasibility analysis, economic viability analysis, environmental risk assessment, resource sustainability assessment and life cycle assessment (LCA). Course will consist of theory and case studies highlighting the use of LCA methods to assess sustainability.
Recommended: ENGR 391 or ENGR391H

BEE 540. ENVIRONMENTAL TRANSPORT PROCESSES. (3 Credits)
Mixing and transport processes in the environment.

BEE 542. VADOSE ZONE TRANSPORT. (4 Credits)
Introduction to the physical and hydraulic properties involved in flow from the soil surface to groundwater. Classical infiltration equations will be derived and presented with exact and approximate solutions. Attention is focused on application to pollutant transport and recent advances in non-ideal flow.
Equivalent to: BRE 542
Recommended: MTH 254

BEE 544. OPEN CHANNEL HYDRAULICS. (4 Credits)
Steady, uniform, and nonuniform flow in natural and artificial open channels; unsteady flow; interaction of flow with river structures; and computational methods. Offered alternate years.
Equivalent to: BRE 544, CE 544
Recommended: CE 313

BEE 545. SEDIMENT TRANSPORT. (4 Credits)
Principles of sediment erosion, transportation and deposition in rivers, reservoirs, and estuaries; measurement, analysis, and computational techniques. Offered even years in winter term. CROSSTLISTED as BEE 545/FE 545.
Equivalent to: BRE 545, FE 545
Recommended: CE 313 or FE 330

BEE 546. RIVER ENGINEERING. (4 Credits)
Multipurpose river use; natural physical processes in alluvial rivers; channel modification practices; river structures; design practices; impact of river modification; problem analysis; and impact minimization. Offered alternate years.
Equivalent to: CE 546
Recommended: CE 313

BEE 549. REGIONAL HYDROLOGIC MODELING. (3 Credits)
Challenges in regional-scale water resource analysis and management with emphasis on application to production agriculture. Application of geostatistical techniques to spatially variable systems and remote sensing to large-scale water resource systems. Development of soil-water-atmosphere-plant models. Analysis of evapotranspiration estimating methods. Offered alternate years.
Equivalent to: BRE 549
Recommended: BEE 512 and MTH 256

BEE 558. NONPOINT SOURCE POLLUTION ASSESSMENT AND CONTROL. (3 Credits)
Problem solving in nonpoint source pollution. Methods for evaluating the extent, rate, timing, and fate of Non-Point Source (NPS) pollutants in agricultural and urban environments.

BEE 568. BIOREMEDIATION ENGINEERING. (4 Credits)
Examines strategies for using a variety of biological processes for treating municipal, agricultural and industrial contaminants. Lec/lab.
BIOE 572. INTRODUCTION TO FOOD ENGINEERING PRINCIPLES. (5 Credits)
Fundamental engineering principles for scientists and non-process engineers. Topics include fluid flow, mass and energy transfer, and material and energy balances. Directed at food scientists and other majors who need or would like a working knowledge of process engineering principles.
Recommended: MTH 112 and (MTH 227 or MTH 251 or MTH 251H) and PH 201

BEE 573. INTRODUCTION TO FOOD ENGINEERING PROCESS DESIGN. (3 Credits)
Fundamental engineering process design principles for food scientists and non-process engineers. Directed at those who need or would like a working knowledge of applied food engineering process design. Lec/rec.
Equivalent to: BEE 553
Recommended: BEE 472 or BEE 572

BEE 585. METABOLIC SYSTEMS ENGINEERING. (3 Credits)
Quantitative and experimental approaches for describing and engineering biological networks and an introduction to the principles and methodologies of metabolic engineering and synthetic biology.
Equivalent to: BIOE 585
Recommended: Statistics, biology, biochemistry or microbiology.

BEE 586. PROBLEM SOLVING FOR METABOLIC SYSTEMS ENGINEERING. (1 Credit)
Corequisites: BEE 585
Recommended: MTH 251 and MTH 252

BEE 599. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BREE 599
This course is repeatable for 16 credits.

BEE 601. RESEARCH. (1-16 Credits)
Equivalent to: BREE 601
This course is repeatable for 16 credits.

BEE 603. THESIS. (1-16 Credits)
Equivalent to: BREE 603
This course is repeatable for 999 credits.

BEE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BREE 605
This course is repeatable for 16 credits.

BEE 606. PROJECTS. (1-16 Credits)
Equivalent to: BREE 606
This course is repeatable for 16 credits.

BEE 607. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: BREE 607
This course is repeatable for 16 credits.

BEE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

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**Biological Data Sciences (BDS)**

BDS 211. USE AND ABUSE OF DATA: CRITICAL THINKING IN SCIENCE. (3 Credits)
Critically examine how data analysis can support legitimate conclusions from biological datasets and also how deceptive visualizations, misleading comparisons, and spurious reasoning can lead to false conclusions. Analyze data to break down the logical flow of an argument and identify key assumptions, even when they are not stated explicitly.
Prerequisites: (MTH 251 (may be taken concurrently) with C- or better or MTH 251H (may be taken concurrently) with C- or better) or MTH 227 with C- or better or MTH 241 with C- or better or MTH 245 with C- or better

BDS 311. COMPUTATIONAL APPROACHES FOR BIOLOGICAL DATA. (3 Credits)
Real-world biological datasets to implement fundamental concepts of efficient algorithm design. Synthesize previously acquired knowledge and skills in biology and computer science to analyze, implement, and apply algorithms that process biological datasets, including large-scale datasets.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and (MTH 252 [C-] or MTH 252H [C-]) and CS 261 [C-] and (BI 213 (may be taken concurrently) [C-] or BI 213H (may be taken concurrently) [C-]) and (ST 351 (may be taken concurrently) [C-] or ST 351H (may be taken concurrently) [C-])

BDS 406. SPECIAL PROJECTS. (1-99 Credits)
This course is repeatable for 99 credits.

BDS 411. *ANALYSIS OF BIOLOGICAL DATA: CASE STUDIES. (3 Credits)
Case studies; synthesize previously acquired knowledge and skills in biology, mathematics, statistics, and computer science to analyze, implement, and draw conclusions from real-world biological datasets. Projects will be completed in the context of small groups. Draws on skills in mathematics, statistics, computer science, and biology.
Prerequisites: (BI 311 with C- or better or BI 311H with C- or better) or (BB 314 with C- or better or BB 314H with C- or better) or MB 310 with C- or better) and ((MTH 252 with C- or better or MTH 252H with C- or better) or MTH 228 with C- or better) and CS 261 [C-] and (ST 352 [C-] or ST 412 [C-])

BDS 491. CAPSTONE PROJECTS IN BIOLOGICAL DATA SCIENCE I. (3 Credits)
Quantitative skills and biological thinking will be used to analyze and draw conclusions from real-world biological datasets. Projects will be completed in the context of small groups. Draws on skills in mathematics, statistics, computer science, and biology.
Prerequisites: (ST 352 with C- or better or ST 412 with C- or better) and (CS 162 [C-] or BOT 476 [C-] or BB 485 [C-] or MTH 427 [C-])

BDS 492. CAPSTONE PROJECTS IN BIOLOGICAL DATA SCIENCE II. (3 Credits)
Quantitative skills and biological thinking will be used to analyze and draw conclusions from real-world biological datasets retrieved in BDS 412. This is a synthesis course that draws skills in mathematics, statistics, computer science, and biology, in which the students will process their curated datasets and draw conclusions.
Prerequisites: BDS 491 with C- or better

BDS 599. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 99 credits.

**Biological Engineering (BIOE)**

BIOE 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Prerequisites:

- Access to the surface science literature.
- Peptide synthesis.
- Modes of electron spectroscopy, vibrational spectroscopy, and mass immobilization of enzymes/DNA, enzyme-antibody conjugates, protein-modification reagents, permanent and cleavable cross-linkers, protein modification reagents, issues surrounding regulation of implants and device failure.

BIOE 351. BIOMATERIALS AND BIOINTERFACES. (3 Credits)

Material interactions with human tissue, with emphasis on the role of interfacial chemistry and physics in cell adhesion, infection, blood coagulation and thrombosis. Preparation of functional hydrogels, material coatings, and derivitizations, including immobilized bio-active molecules. Issues surrounding regulation of implants and device failure.

Prerequisites:

- BB 231 with C or better or Z 331 with C or better and (CHE 332 [C] or CHE 332H [C])

Recommended: Completion or concurrent enrollment in BI 233 and (CHE 333 or CHE 333H)

BIOE 351 with C or better or BB 451H with C or better and (CHE 333 or CHE 333H [C])

This course is repeatable for 16 credits.

BIOE 445. SURFACE ANALYSIS. (3 Credits)

The characterization of molecular, biological, and engineered surfaces by modern surface analytical techniques. Topics include surface sensitive modes of electron spectroscopy, vibrational spectroscopy, and mass spectrometry. Students will interpret surface analytical data and gain access to the surface science literature.

Prerequisites: BIOE 351 (may be taken concurrently) with C or better

Recommended: BB 451 and CHE 333
BIOE 513. DRUG AND MEDICAL DEVICE REGULATIONS IN TECHNOLOGY DEVELOPMENT. (2 Credits)
Overview of the processes by which drugs and devices are regulated by the Food and Drug Administration. Topics include drug and device classifications, approval routes for different classes of drugs and devices, current good manufacturing practices, process validation, and quality assurance and control.

BIOE 520. SOCIAL JUSTICE, ETHICS, AND ENGINEERING. (3 Credits)
Examination of difference, power, and discrimination in engineering education and practice. Lec/rec.

BIOE 540. BIOCONJUGATION. (3 Credits)
Survey of theory and practical current methods for chemical modification and conjugation of proteins and other biomolecules. Topics include permanent and cleavable cross-linkers, protein modification reagents, immobilization of enzymes/DNA, enzyme-antibody conjugates, protein-protein interactions, PEGylation and labeling of proteins, and solid-phase peptide synthesis.
Recommended: BB 450

BIOE 545. SURFACE ANALYSIS. (3 Credits)
The characterization of molecular, biological, and engineered surfaces by modern surface analytical techniques. Topics include surface sensitive modes of electron spectroscopy, vibrational spectroscopy, and mass spectrometry. Students will interpret surface analytical data and gain access to the surface science literature.
Recommended: BIOE 351

BIOE 557. BIOREACTORS. (3 Credits)
Design and analysis of bioreactors using suspension and immobilized microbial cultures.
Recommended: (BB 451 or BB 451H) and (CHE 333 or CHE 333H)

BIOE 562. BIOSEPARATIONS. (3 Credits)
Application of basic mass transfer, reaction kinetics and thermodynamic principles to understanding, selection, and development of strategies for the recovery of products from bioreactors.
Recommended: BB 451 and CHE 332

BIOE 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BIOE 603. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

Biology (BI)

BI LD1. GENERAL CREDIT. (1-16 Credits)

BI LD2. GENERAL CREDIT. (1-16 Credits)

BI 101. *ENVIRONMENTAL BIOLOGY: ECOLOGY, CONSERVATION, GLOBAL CHANGE. (4 Credits)
Introduction to ecosystems, including biodiversity, species interactions, human impacts, and conservation biology. Lectures introduce biological themes and research in the context of current issues in science and society. Hands-on laboratories focus on using organisms and technologies to explore biology and develop skills for lifelong learning. No previous science courses are required, intended for non-biological science majors. This course can be taken alone or in any combination with BI 102 or 103. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

BI 102. *ANIMAL BIOLOGY: GENES, BEHAVIOR AND EVOLUTION OF LIFE. (4 Credits)
Introduction to how genetics shapes life on Earth, including how understandings of DNA and environmental factors are leading to biotechnological advances. Lectures introduce biological themes and research in the context of current issues in science and society. Hands-on laboratories focus on using organisms and technologies to explore biology and develop skills for lifelong learning. No previous science courses are required, intended for non-biological science majors. This course can be taken alone or in any combination with BI 101 and BI 103. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BI 102H

BI 103. *HUMAN BIOLOGY: ANATOMY, PHYSIOLOGY AND DISEASE. (4 Credits)
Introduction to the biology of humans, including aspects of human health and disease. Lectures introduce biological themes and research in the context of current issues in science and society. Hands-on laboratories focus on using organisms and technologies to explore biology and develop skills for lifelong learning. No previous science courses are required, intended for non-biological science majors. This course can be taken alone or in any combination with BI 101 and BI 102. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BI 103H

BI 109. HEALTH PROFESSIONS: MEDICAL. (1 Credit)
Discussion of matters relating to a medical career. Includes application procedures, the importance of various requirements, admissions, professional school curricula, financing education, and related matters. Speakers are included. Graded P/N.

BI 111. INTRODUCTION TO MARINE LIFE IN THE SEA: MARINE HABITATS. (1 Credit)
A field-focused learning experience exploring the varied marine life and habitats on the Oregon coast, including rocky shores, sandy beaches, mud flats, bays and estuaries. Students will also be introduced to the breadth of marine science course offerings and research at Oregon State University's Hatfield Marine Science Center located in Newport, Oregon. Graded P/N.
Equivalent to: FW 111

BI 150. INTRODUCTION TO MARINE BIOLOGY. (3 Credits)
Survey of marine organisms, the environments they inhabit, and their evolutionary adaptations for thriving in those environments. The course will also highlight current conservation challenges that threaten marine life, such as climate change, overfishing, and pollution.

BI 175. *GENOMES, IDENTITIES AND SOCIETIES. (3 Credits)
DNA's roles in shaping our senses of identity, individuality, and societal interconnectivity will be analyzed. New advances in genetic technology will be explored, along with their potential impacts on society. The relationships between genetics and discrimination will be examined with focus on cases from Oregon, America, and the world. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
BI 197. PROFESSIONAL DEVELOPMENT I: HEALTH PROFESSIONS. (1 Credit)
Integrative Biology faculty and other professionals introduce a variety of human health professions including dentistry, medicine, pharmacy and others (veterinary medicine students take BI 198). Emphasizes professional development through exploring relevant social and cognitive concepts, as well as engaging in experiential learning and networking. Departmental and campus student success resources are highlighted. Graded P/N.

BI 198. PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY. (1 Credit)
Integrative Biology faculty and biology professionals introduce life science careers outside of human health professions (human health profession students take BI 197). Emphasizes professional development through exploring relevant social and cognitive concepts, as well as engaging in experiential learning and networking. Departmental and campus student success resources are highlighted. Graded P/N.

BI 199. SELECTED TOPICS. (1-16 Credits)
Field Ecology.
Equivalent to: BI 199H
This course is repeatable for 16 credits.

BI 199H. SELECTED TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 199
This course is repeatable for 16 credits.

BI 204. *INTRODUCTORY BIOLOGY I. (4 Credits)
Foundations of biological sciences including scientific inquiry, genetics, evolution, and ecology. Significant emphasis throughout on the application of core concepts to solve human and environmental problems. Laboratory emphasizes skills in critical thinking, scientific writing, and experimental design. Not intended for pre-health profession students. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

BI 205. *INTRODUCTORY BIOLOGY II. (4 Credits)
Fundamental concepts in molecular and cellular biology, beginning with biomolecules and the origin of life, and ending with genomics. Significant emphasis throughout on applications of biotechnology to solve human problems. Laboratory emphasizes skills in critical thinking, scientific writing, and experimental design. Not intended for pre-health profession students. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Prerequisites: CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or ((CH 231 may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) [D-] or CH 261H (may be taken concurrently) [D-] or CH 271 (may be taken concurrently) [D-] or CH 271H (may be taken concurrently) [D-])

BI 206. *INTRODUCTORY BIOLOGY III. (4 Credits)
Basic plant and animal physiology from an evolutionary perspective. Significant emphasis on topics of importance to human society, including human and plant disease. Laboratory emphasizes skills in critical thinking, scientific writing, and experimental design. Not intended for pre-health professional students. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Prerequisites: CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or ((CH 231 may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) [D-] or CH 271 (may be taken concurrently) [D-] or CH 271H (may be taken concurrently) [D-])

BI 211. *PRINCIPLES OF BIOLOGY. (4 Credits)
Origins of life, energy transformations, plant and animal diversity. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: BI 211

BI 212. *PRINCIPLES OF BIOLOGY. (4 Credits)
Cell biology, organ systems, plant and animal physiology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator

BI 212H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Cell biology, organ systems, plant and animal physiology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Prerequisites: CH 121 (may be taken concurrently) with D- or better or CH 201 (may be taken concurrently) with D- or better or CH 221 (may be taken concurrently) with D- or better or CH 224H (may be taken concurrently) with D- or better or ((CH 231 may be taken concurrently) with D- or better or CH 231H (may be taken concurrently) with D- or better) and (CH 261 (may be taken concurrently) [D-] or CH 261H (may be taken concurrently) [D-] or CH 271 (may be taken concurrently) [D-] or CH 271H (may be taken concurrently) [D-])
Equivalent to: BI 212

BI 213. *PRINCIPLES OF BIOLOGY. (4 Credits)
Genetics, evolution, natural selection, and ecology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Prerequisites: CH 121 with D- or better or CH 201 with D- or better or CH 221 with D- or better or CH 224H with D- or better or ((CH 231 with D- or better or CH 231H with D- or better) and (CH 261 [D-] or CH 261H [D-] or CH 271 [D-]))
Equivalent to: BI 213H
BI 213H. *PRINCIPLES OF BIOLOGY. (4 Credits)
Genetics, evolution, natural selection, and ecology. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Prerequisites: CH 121 with D- or better or CH 201 with D- or better or CH 221 with D- or better or CH 224H with D- or better or ((CH 231 with D- or better or CH 231H with D- or better) and (CH 261 [D-] or CH 261H [D-] or CH 271 [D-]))
Equivalent to: BI 213

BI 231. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The first of a three-term introductory series. Using a strong gross anatomy focus, course topics address fundamental concepts of biology as they apply to human anatomy and physiology and then focus on understanding the structures, functions, and regulatory mechanisms involved in the human nervous, endocrine and integumentary systems. BI 231 is a required prerequisite to BI 232 and BI 233. The BI 241 Lab is optional but prerequisite for either of the subsequent BI 242 or BI 243 lab courses in the series. Lec.

BI 232. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The second of a three-term introductory series. Using a strong gross anatomy focus, course topics address the structures, functions and regulatory mechanisms involved in the human cardiovascular, respiratory, urinary and digestive systems. Lec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better

BI 233. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The third of a three-term introductory series. Using a strong gross anatomy focus, course topics address the structures, functions, and regulatory mechanisms involved in the human skeletal, muscular and integumentary systems.
Prerequisites: BI 231 (may be taken concurrently) with C- or better

BI 241. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The first of a three-term introductory series. Using the human cadaver (prosection), course topics address fundamental concepts of biology as they apply to human anatomy and physiology and then focus on understanding the structures, functions, and regulatory mechanisms involved in the human skeletal, muscular and integumentary systems. Physiology demonstrations illustrate functions of organ systems. Lab/rec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better

BI 242. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The second of a three-term introductory series. Using the human cadaver (prosection) and dissection of preserved specimens with a strong gross anatomy focus, course topics address the structures, functions and regulatory mechanisms involved in the nervous, endocrine and reproductive systems. Physiology demonstrations illustrate functions of organ systems. Lab/rec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better and BI 232 (may be taken concurrently) [C-] and BI 241 (may be taken concurrently) [C-]

BI 243. INTRODUCTION TO HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The third of a three-term introductory series. Using the human cadaver (prosection) and dissection of preserved specimens with a strong gross anatomy focus, course topics address the structures, functions, and regulatory mechanisms involved in the human cardiovascular, respiratory, urinary and digestive systems. Physiology demonstrations illustrate functions of organ systems. Lab/rec.
Prerequisites: BI 231 (may be taken concurrently) with C- or better and BI 233 (may be taken concurrently) [C-] and BI 241 (may be taken concurrently) [C-]

BI 298. PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II. (1 Credit)
Students will develop awareness of the elements of professional development, identify strategic areas for growth, and design an exploration plan. Emphasis is placed on being able to analyze career opportunities to determine the best mix of technical and professional skills needed for success as a biological science professional. Graded P/N.
Equivalent to: BI 298H

BI 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BI 301. *HUMAN IMPACTS ON ECOSYSTEMS. (3 Credits)
Selected human impacts on ecosystems are examined in depth, including air quality, global climate change, management of agricultural and forest resources, and threats to biological diversity. The causes, approaches to investigating, and potential solutions for each issue are discussed from a scientific and social perspective. Adverse effects on ecosystems that result from each environmental problem are examined. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Recommended: One year of college biology or chemistry

BI 306. **ENVIRONMENTAL ECOLOGY. (3 Credits)
Biological, physical, and chemical nature of both natural and human-disturbed ecosystems. Topics include population and conservation ecology, toxins in the food chain and in the environment, forest decline and acid rain, eutrophication of terrestrial and aquatic ecosystems, and ecosystem restoration. Offered alternate years. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC
Equivalent to: BI 306H
Recommended: One year of college biology and chemistry.

BI 306H. **ENVIRONMENTAL ECOLOGY. (3 Credits)
Biological, physical, and chemical nature of both natural and human-disturbed ecosystems. Topics include population and conservation ecology, toxins in the food chain and in the environment, forest decline and acid rain, eutrophication of terrestrial and aquatic ecosystems, and ecosystem restoration. Offered alternate years. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: BI 306
Recommended: One year of college biology and chemistry

BI 309. TEACHING PRACTICUM. (1-6 Credits)
Introductory experience for students assisting with instruction in Biology or Zoology courses. Admission is by application. See Cordley 3029 for details.
This course is repeatable for 6 credits.
BI 311. GENETICS. (4 Credits)
Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics. Lec/rec.
**Prerequisites:** (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C- or BI 212H [C-]) and (BI 213 [C- or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
**Equivalent to:** BI 311H

BI 311H. GENETICS. (4 Credits)
Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics. Lec/rec.
**Attributes:** HNRS – Honors Course Designator
**Prerequisites:** ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C- or BI 212H [C-]) and (BI 213 [C- or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
**Equivalent to:** BI 311

BI 315. MOLECULAR BIOLOGY LABORATORY. (3 Credits)
Laboratory projects exploring the transmission of genetic information from storage to function will introduce students to fundamental molecular biology concepts and techniques, including isolation of DNA, construction of recombinant plasmids, quantification of gene expression in model organisms, polymerase chain reaction, and analysis of protein expression and subcellular localization. Lec/lab. CROSSTLISTED as BB 315/BI 315.
**Prerequisites:** BB 314 (may be taken concurrently) with C- or better or BI 314H (may be taken concurrently) with C- or better
**Equivalent to:** BB 315

BI 317.  *SCIENTIFIC THEORY AND PRACTICE. (3 Credits)*
Teaches students the practice of biological science. Topics cover scientific theory, communications, ethics and critical evaluation.
**CROSSLISTED as BB 317/BI 317.** (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC
**Prerequisites:** (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C- or BI 212H [C-]) and (BI 213 [C- or BI 213H [C-])
**Equivalent to:** BB 317

BI 319.  *CRITICAL THINKING AND COMMUNICATION IN THE LIFE SCIENCES. (3 Credits)*
Teaches students the practice of biological science. Topics cover scientific theory, written and spoken communications, ethics and critical evaluation. (Writing Intensive Course) CROSSTLISTED as Z 319.
**Attributes:** CWIC – Core, Skills, WIC
**Prerequisites:** (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C- or BI 212H [C-]) and (BI 213 [C- or BI 213H [C-]) and (ST 351 [D-] or ST 351H [D-]) and ST 352 (may be taken concurrently) [D-]
**Equivalent to:** Z 319

BI 331. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The first of a three-term advanced series. With a strong focus on the physiological underpinnings of disease, course topics address the fundamental concepts of human anatomy and physiology and then focus on understanding the structures, functions, regulatory mechanisms and common pathologies involved in the human skeletal, muscular and integumentary systems. Lec.
**Prerequisites:** (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C- or BI 212H [C-]) and (BI 213 [C- or BI 213H [C-]) and (CH 123 [C- or (CH 233 [C- or CH 233H [C-]) and (CH 263 [C- or CH 263H [C-)]) and BI 341 (may be taken concurrently) [C-]

BI 332. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The second of a three-term advanced series. With a strong focus on the physiological underpinnings of disease, course topics address the structures, functions, and regulatory mechanisms involved in the nervous, endocrine and reproductive systems. Lec.
**Prerequisites:** BI 331 with C- or better and BI 342 (may be taken concurrently) [C-]

BI 333. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY. (3 Credits)
The third part of a three-term advanced series. With a strong focus on the physiological underpinnings of disease, course topics address the structures, functions, and regulatory mechanisms involved in the cardiovascular, respiratory, urinary and digestive systems. Lec.
**Prerequisites:** BI 332 with C- or better and BI 343 (may be taken concurrently) [C-]

BI 341. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The first of a three-term advanced series. Using the human cadaver (prosection) and physiological data acquisition equipment, course topics address the fundamental concepts of human anatomy and physiology and then focus on understanding the structures, functions, regulatory mechanisms and common pathologies involved in the human skeletal, muscular and integumentary systems. Lab.
**Corequisites:** BI 331

BI 342. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The second of a three-term advanced series. Using the human cadaver (prosection) and physiological data acquisition equipment, course topics address the structures, functions, regulatory mechanisms and common pathologies involved in the human cardiovascular, respiratory, urinary and digestive systems. Lab.
**Corequisites:** BI 332

BI 343. ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY. (2 Credits)
The third of a three-term advanced series. Using the human cadaver (prosection), dissection of preserved specimens, and physiological data acquisition equipment, course topics address the structures, functions, regulatory mechanisms and common pathologies involved in the human cardiovascular, respiratory, urinary and digestive systems. Lab.
**Corequisites:** BI 333

BI 345.  *INTRODUCTION TO EVOLUTION. (3 Credits)*
Elements of evolutionary theory; origin and history of life; evolutionary controversy; origins of species, sex, and humans. (Bacc Core Course)
**Attributes:** CSST – Core, Synthesis, Science/Technology/Society
**Equivalent to:** Z 345

BI 347.  *OCEANS IN PERIL. (3 Credits)*
The interactions of society and the marine environment, emphasizing the ecological, biogeochemical, economic, sociological, and political significance of the oceans. Topics of current critical importance will include marine pollution, protecting marine habitats, conserving marine biodiversity, fisheries and aquaculture, ocean energy, biogeochemical change, global warming, ocean acidification, and sea level rise. Lecture (Bacc Core Course).
**Attributes:** CSST – Core, Synthesis, Science/Technology/Society
**Prerequisites:** BI 101 with C- or better or BI 102 with C- or better or BI 211 with C- or better or BI 211H with C- or better or BI 213 with C- or better or BI 213H with C- or better or BI 204 with C- or better or BI 150 with C- or better
BI 348. *HUMAN ECOLOGY. (3 Credits)
The impact of humans on the environment, emphasizing the political, sociological, and ecological consequences of human population growth. Topics of current critical importance will include global warming trends, destruction of the ozone layer, consequences of pollution, habitat destruction, the loss of biodiversity, and conservation biology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: Z 348

BI 351. MARINE ECOLOGY. (3 Credits)
Ecological interactions and principles in different marine habitats. Topics include the organisms (plants, invertebrates, vertebrates) found in major habitats and interactions between organisms. Habitats discussed include coral reefs, rocky shores, kelp forests, near-shore waters, open-ocean waters, and the deep sea. Emphasis is placed on how organism-organism interactions produce varying patterns of distribution, abundance, body size, diversity, stability, and succession.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: Z 351

BI 353. PACIFIC NORTHWEST COASTAL ECOSYSTEMS. (4 Credits)
A field-based introduction to the diversity of ecosystems of the Pacific Northwest coast. Biological and physical processes affecting the distribution, structure, community composition and physical features of these systems are explored through a variety of lectures and field trips. Ecosystem services and human impacts are examined.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]))

BI 358. SYMBIOSES AND THE ENVIRONMENT. (3 Credits)
Overview of the diversity of mutualistic symbioses and their roles in the natural environment. Integrative approach, from ecosystem to molecule, to the examination of certain key mutualisms. Lec. Offered alternate years.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 123 [C-] or CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-]))

BI 370. ECOLOGY. (3 Credits)
The study of interactions between organisms and their biotic and abiotic environments at the population, community, ecosystem, and biosphere levels of organization.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]))
Equivalent to: BI 370H

BI 370H. ECOLOGY. (3 Credits)
The study of interactions between organisms and their biotic and abiotic environments at the population, community, ecosystem, and biosphere levels of organization.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]))
Equivalent to: BI 370

BI 371. *ECOLOGICAL METHODS. (3 Credits)
Experimental design, data collection, analysis and synthesis in ecological studies; local ecosystems emphasized. May have field trip fee. Lec/lab.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: BI 370 with D- or better or BI 370H with D- or better

BI 373. *FIELD METHODS IN MARINE ECOLOGY. (3 Credits)
Exposure to research methods used in field studies of the marine rocky intertidal ecosystem. Research projects and writing exercises provide students with hands-on experience of collecting, analyzing, and presenting marine ecological data. Field trip fee. Lab fee. Lec/lab.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 351 (may be taken concurrently) with D- or better or BI 370 with D- or better or BI 370H with D- or better and (ST 351 [D-] or ST 351H [D-]) or (ST 351 [D-] or ST 351H [D-])
Recommended: ST 352

BI 375. FIELD METHODS IN ECOCLOGICAL RESTORATION. (4 Credits)
Observation and application of theory and practice in ecological restoration. Using site visits and hands-on research, explores the roles in restoration of fire, local adaptation, disturbance history, natural history, beaver, and soils, including visits to several active and completed restoration projects and overnights in the field. Lab.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]))

BI 399. SPECIAL TOPICS. (0-16 Credits)
May be repeated for 16 total credits.
Equivalent to: BI 399H
This course is repeatable for 16 credits.

BI 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: BI 401H
This course is repeatable for 16 credits.

BI 401H. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 401
This course is repeatable for 16 credits.

BI 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BI 405H
This course is repeatable for 16 credits.

BI 406. PROJECTS: CURATORIAL ASSISTANT. (1-6 Credits)
Students assist with curatorial projects in OSU biological collections. Admission is by application. See Cordley 3029 for details.
This course is repeatable for 6 credits.

BI 407. SEMINAR. (1 Credit)
Departmental seminar. Graded P/N.
Equivalent to: BI 407H, BI 407H, BOT 407, BOT 407H
This course is repeatable for 16 credits.

BI 407H. SEMINAR. (1 Credit)
Departmental seminar. Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 407
This course is repeatable for 16 credits.
BI 409. ADVANCED TEACHING PRACTICUM. (1-6 Credits)
Advanced practicum experience for students assisting in Biology or Zoology courses. Includes advanced training in course content and development of instructional materials. Admission is by application. See Cordley 3029 for details.
This course is repeatable for 6 credits.

BI 410. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BI 420. VIRUSES IN MODERN SOCIETY. (3 Credits)
Impact of viruses on modern civilization. Molecular mechanisms of viral infectivity. Approaches to the prevention and cure of viral diseases. Role of viruses in agriculture and industry. Offered alternate years. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: BI 311 with D- or better or BI 311H with D- or better or BI 314 with D- or better or BI 314H with D- or better

BI 427. PALEOBIOLOGY. (4 Credits)
Fossils provide a direct window into the evolution, extinction, and ecology of past life on Earth. A process-based study of the marine and terrestrial fossil record is taken to explore the topics of preservation, macroevolution, extinction of biotas, biomechanics, paleoecology, and climate change. Required laboratory and weekend field trip.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) or GEO 203 [D-]
Equivalent to: Z 427

BI 445. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Prerequisites: BI 311 with D- or better or BI 311H with D- or better
Equivalent to: BI 445H

BI 445H. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Attributes: HNRS – Honors Course Designator
Prerequisites: BI 311 with D- or better or BI 311H with D- or better
Equivalent to: BI 445

BI 450. MARINE BIOLOGY AND ECOLOGY. (15 Credits)
A comprehensive lecture and laboratory introduction to the flora and fauna of the marine environment approached from the level of the organism to ecosystem. Ecological patterns and processes characteristics of marine communities will be emphasized. Lec/lab. Taught at Hatfield Marine Science Center, Newport, OR. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 370 with D- or better or BI 370H with D- or better) and (ST 351 [D-] or ST 351H [D-])
Recommended: ST 352

BI 451. FUNCTIONAL ANATOMY OF THE HUMAN MUSCULAR SYSTEM. (4 Credits)
In-depth dissection of the orientation, innervation, and functional significance of muscles and muscle groups. Topics include muscle identification, joint anatomy and variation of human form. BI 551 student expectations include vascularization and detailed joint anatomy. The laboratory component will consist of the dissection of the muscular anatomy of a human cadaver. Lab fee. Lec/lab.
Prerequisites: ((BI 231 with D- or better and BI 241 [D-] or (BI 331 [D-) and BI 341 [D-])) and ((BI 232 [D-] and BI 242 [D-]) or (BI 332 [D-] and BI 342 [D-])) and (((BI 233 [D-] and BI 243 [D-]) or (BI 333 [D-] and BI 343 [D-]))
Equivalent to: Z 451

BI 456. PHYLOGENETICS. (4 Credits)
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Prerequisites: (ST 351 with D- or better or ST 351H with D- or better) and (ST 352 (may be taken concurrently) [D-] or ST 411 (may be taken concurrently) [D-]) and (BI 311 [D-] or BI 311H [D-] or BI 445 [D-] or BI 445H [D-])

BI 481. BIOGEOGRAPHY. (3 Credits)
Biogeography is the study of the distribution of biodiversity. We focus on abiotic (geological, climatological) and biotic (ecological, evolutionary) factors that govern diversity across space and through time, emphasizing assembly of communities, global change, and conservation in today's rapidly changing world. The course format includes lecture, computer-based activities, and discussion. Offered winter term in odd years.
Prerequisites: BI 370 with D- or better or BI 370H with D- or better
Equivalent to: Z 481

BI 483. POPULATION BIOLOGY. (3 Credits)
Theoretical and empirical views of the structure and function of populations from across the tree of life, emphasizing the integration of ecological and evolutionary approaches. Lec.
Prerequisites: (MTH 241 with D- or better or MTH 251 with D- or better or MTH 251H with D- or better or MTH 227 with D- or better) and (ST 351 [D-] or ST 351H [D-]) and (ST 352 (may be taken concurrently) [D-] or ST 411 (may be taken concurrently) [D-]) and (BI 311 [D-] or BI 311H [D-] or BI 370H [D-] or BI 370H [D-])

BI 485. MONSTER BIOLOGY. (3 Credits)
Scientists seek to explain what exists and why things are. An alternative approach is to ask why things are not. Biological and physical laws are used to critically and rigorously assess why monsters from literature, television and film are not possible in the real world.
Prerequisites: (BI 311 (may be taken concurrently) with D- or better or BI 311H (may be taken concurrently) with D- or better) and (BI 370 (may be taken concurrently) [D-] or BI 370H (may be taken concurrently) [D-])

BI 495. DISEASE ECOLOGY. (3 Credits)
An introduction to disease ecology—the study of disease processes in natural populations and communities. The course focuses on (I) the role parasites play in the ecology and evolution of animal populations, including humans; and (II) the relevance of ecological and evolutionary considerations in managing infectious diseases.
Prerequisites: BI 370 with C- or better or BI 370H with C- or better

1186  Biology (BI)
BI 498. SENIOR BIOLOGY FIELD TEST. (0 Credits)
A comprehensive, two-hour exam to assess the biological knowledge of Biology and Zoology seniors. Students must complete the exam in their final undergraduate term or during spring term if graduating during summer when it is not offered. A pass will be given to all students who complete the exam. More details at http://ib.oregonstate.edu/advising/MFT-info.

BI 499. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
Equivalent to: BI 499H

BI 499H. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary.
Attributes: HNRS – Honors Course Designator
Equivalent to: BI 499
This course is repeatable for 16 credits.

Bioresource Research (BRR)

BRR 100. GREAT EXPERIMENTS IN BIORESOURCE SCIENCES. (2 Credits)
For students interested in BRR and undergraduate research, to introduce the research process and help them start defining research interests and project areas. Faculty describe research projects and experimental approaches, and pose interesting political and ethical questions related to scientific research. Students work with junior and senior student mentors already involved in research projects. Offered fall term.
This course is repeatable for 4 credits.

BRR 200. SCIENCE AND RESEARCH. (2 Credits)
An introduction to science concepts, professional skills and science literacy for organizing, planning, designing and conducting research in biological, agricultural and natural resource science. Learn the process of research, prepare a resume for prospective research mentors, and work in teams to analyze a timely and relevant problem, formulate experimental approaches to address it, and write a research proposal.

BRR 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

BRR 325. *ENERGY TECHNOLOGY AND SOCIAL CHANGE. (3 Credits)
Science and technology co-evolve with a prosperous human society. The course discusses key issues surrounding the interaction between social changes and energy technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: One term physical science with lab.

BRR 399. SPECIAL TOPICS. (0-4 Credits)
This course is repeatable for 6 credits.

BRR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Undergraduate mentored research. Students select a faculty research mentor (from 7 OSU colleges) and complete 14 credits of research. Students follow established guidelines to prepare project proposals, progress reports, and a thesis; learn research methods applicable to their chosen field; gain professional skills and contacts. Students are evaluated on their ability to develop and complete a research project proposal, learn and develop research methodologies, conduct research and trouble-shooting procedures, and demonstrate responsible and ethical participation in the research project. Offered all terms.
This course is repeatable for 99 credits.

BRR 403. *THESIS. (4 Credits)
BRR students independently interpret and present their research in writing. Students write the thesis in a style appropriate for submission to a peer-reviewed journal in their chosen scientific discipline. Students receive a letter grade based on their final thesis. Timeliness of reports is factored in student assessments. The student’s faculty mentor and the BRR Director provide a consensus grade when the thesis is completed. Offered all terms. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

BRR 404. WRITING AND CONFERENCE. (1-3 Credits)
Thesis writing for Bioenergy minor and other students.
This course is repeatable for 3 credits.

BRR 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BRR 406. PROJECTS-DATA PRESENTATIONS. (1 Credit)
For any student doing research, to learn to develop and evaluate poster and slide presentations containing scientific data. Students are exposed to a variety of scientific disciplines as they prepare and critique their own and other students’ posters and oral presentations. Students improve written and oral communication skills. Letter grade is based on participation, improvement, and the quality of a final poster project and oral presentation. Offered winter term. CROSSTLISTED as BRR 406/HORT 406.
Equivalent to: HORT 406

BRR 407. SEMINAR. (1 Credit)
For BRR students, to encourage excellence in public speaking. Exposes students to a variety of current seminar topics and provides them with the opportunity to evaluate components of good public seminars. Students receive a grade only after completing a public seminar on their own research (final research seminar). Offered spring term.

BRR 409. PRACTICUM: TEACHING AND PEER MENTORING. (2-4 Credits)
Upper-division BRR students are grouped with lower-division students in BRR 100 to facilitate discussion and encourage dialogue about current research topics. Juniors and seniors Juniors and seniors continue to learn new ways to teach and communicate science issues in written and verbal formats.
This course is repeatable for 16 credits.

BRR 410. INTERNSHIP. (1-12 Credits)
Supervised internship allowing students to gain off-campus work experience for credit. Under direction and approval of the program director, students will submit a statement of intent, identify employer contact, and provide a written report upon completion.
This course is repeatable for 16 credits.

BRR 499. SPECIAL TOPICS. (2 Credits)
This course is repeatable for 4 credits.

Botany and Plant Pathology (BOT)

BOT 101. *BOTANY: A HUMAN CONCERN. (4 Credits)
Introductory botany for non-majors, emphasizing the role of plants in the environment, agriculture and society. Includes molecular approaches to the study of plant function and genetic engineering. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
BOT 220. *INTRODUCTION TO PLANT BIOLOGY. (4 Credits)
Introduction to plant biology including an overview of major groups of plants, plant cells and cell types, plant anatomy and architecture, physiology and function, and ecology and the roles of plants in the environment. Laboratory exercises build on lecture themes and provide hands-on learning experiences including field trips. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science

BOT 313. PLANT STRUCTURE. (4 Credits)
The structural components of vascular plants and how plant structure relates to function, development, environment, evolution, and human use of plants. Field trip. Lec/lab.
Prerequisites: (BI 212 with D- or better or BI 212H with D- or better) and ((BI 211 with D- or better or BI 211H with D- or better) or (BI 213 with D- or better or BI 213H with D- or better)) or (BI 205 with D- or better and BI 206 [D-])
Recommended: BI 213 or BI 213H

BOT 321. PLANT SYSTEMATICS. (4 Credits)
Vascular plant classification, diversity, and evolutionary relationships. Lab emphasizes the collection and identification of ferns, gymnosperms, and flowering plants in Oregon. Field trips. Lec/lab.
Equivalent to: BOT 221
Recommended: BI 213 or BI 213H

BOT 322. ECONOMIC AND ETHNOBOTANY: ROLE OF PLANTS IN HUMAN CULTURE. (3 Credits)
Economic and cultural (ethnobotanical) uses of plants and fungi by humans, including domesticated cultivated plants as well as wild-growing plants, and uses of plants and fungi by indigenous cultures. Ecampus course only.

BOT 323. *FLOWERING PLANTS OF THE WORLD. (3 Credits)
Global perspective of plant biodiversity with a focus on evolutionary origins, classification, and evolutionary relationships of the major groups of plants. Development and application of scientific writing and utilization of online information resources in plant evolutionary biology. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: One year of college biology

BOT 324. *FUNGI IN SOCIETY. (3 Credits)
Explores the diverse roles played by fungi in relation to human civilization and the natural environment. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: One course in biological sciences

BOT 325. *INTERSECTIONS BETWEEN PLANTS AND HUMANITY. (3 Credits)
The unique attributes of plants—including aspects of their biochemistry, growth, structure, and physiology—have influenced all aspects of life on earth, from biogeochemical cycles to the rise and expansion of human civilizations. Plants are sources of medicines, stimulants, hallucinogens, fibers and woods, resins and latex, oils and waxes; plants have inspired technological innovation, exploration, and exploitation of people and the environment. This course critically examines the intersections of plants with society and technology by exploring the roles plants have played in both historical and modern contexts. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: One course in biological sciences and junior standing.

BOT 331. PLANT PHYSIOLOGY. (4 Credits)
Survey of physiological processes in plants, including photosynthesis and plant metabolism, mineral nutrition and ion uptake processes, plant cell/water relations, regulation of plant growth and development, and transpiration and translocation. Lec/rec.
Prerequisites: ((BI 212 with D- or better or BI 212H with D- or better) and (BI 213 [D-] or BI 213H [D-]) or (BI 205 [D-] and BI 206 [D-]) and (CH 123 [D-] or (CH 233 [D-] and CH 263 [D-]))
Recommended: (BI 213 or BI 213H) and ((CH 123 or (CH 233 and CH 263))

BOT 332. LABORATORY TECHNIQUES IN PLANT BIOLOGY. (3 Credits)
Laboratory experiences in the manipulation and observation of physiological processes in plant systems. Analysis and interpretation of physiological data generated in experimentation with plant systems. Training in basic laboratory skills, including the principles and procedures involved in the use of common items of laboratory instrumentation. Lab.
Recommended: BOT 331 or BI 314 or BB 314

BOT 341. PLANT ECOLOGY. (4 Credits)
Study of higher plants in relation to their environment. The relationship of plant physiology and reproduction to environmental factors; competition and other species interactions; the structure, dynamics and analysis of vegetation. Field trips. Lec/lab.
Recommended: BOT 321 and (BI 213 or BI 213H)

BOT 350. INTRODUCTORY PLANT PATHOLOGY. (4 Credits)
Symptoms, causal agents, diagnosis, and prevention of plant diseases, with emphasis on fungi, bacteria, nematode, and virus pathogens. Lec/ lab.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-]) and (BI 213 [D-] or BI 213H [D-]) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])

BOT 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 406. PROJECTS: CURATORIAL ASSISTANT. (1-6 Credits)
Students assist with curatorial projects in the OSU Herbarium. Admission is by application to the Department of Botany & Plant Pathology. This course is repeatable for 6 credits.

BOT 407. SEMINAR. (1 Credit)
Section 1: Departmental seminar. Section 2: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.
Equivalent to: BI 407H, BOT 407H
This course is repeatable for 16 credits.

BOT 407H. SEMINAR. (1 Credit)
Section 1: Departmental seminar. Section 3: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: BOT 407
This course is repeatable for 16 credits.

BOT 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
BOT 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 413. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important
groups, prediction of pathogen responses to environmental changes, and
management strategies for protection of forest resources. Field trips.
Lec/lab. CROSSLISTED as BOT 413/FOR 413.
Prerequisites: BI 204 with C or better or BI 212 with C or better or BI 212H
with C or better or BI 213 with C or better or BI 213H with C or better
Equivalent to: FOR 413

BOT 414. AGROSTOLOGY. (4 Credits)
Classification and identification of grasses, with emphasis on the modern
system of grass classification; laboratory practice in keying grass
specimens to genus and species. Lec/lab.
Recommended: BOT 321

BOT 416. AQUATIC BOTANY. (4 Credits)
Taxonomy and ecology of aquatic vegetation, emphasizing freshwater
and marine algae and the submergent vascular plants. Morphology,
physiology, and classification of the algae; morphological and
physiological adaptations of aquatic vascular plants; and primary
production in aquatic ecosystems. Laboratory practice in the
identification of local taxa. Field trips. Lec/lab.
Recommended: BI 213 or BI 213H

BOT 425. FLORA OF THE PACIFIC NORTHWEST. (3 Credits)
Vascular plant identification, terminology, and diagnostic characteristics
of plant families. Lab emphasizes the use of keys for identification to the
species level and ability to recognize by sight those plant families found
in the Pacific Northwest. Field trips. Lec/lab.
Recommended: BOT 321

BOT 440. FIELD METHODS IN PLANT ECOLOGY. (4 Credits)
Concepts and tools for describing, monitoring, and experimenting
on vegetation. Combines Web-based material, field experience at the
student's location, and student projects.
Recommended: Course in ecology and a course in statistics.

BOT 442. PLANT POPULATION ECOLOGY. (3 Credits)
Ecological aspects of plant form and reproduction; demography and
population modeling; species interactions, including competition,
mutualism, and herbivory. Lec/lab.
Recommended: BOT 341

BOT 458. ECOSYSTEMS GENOMICS. (3 Credits)
Genomic approaches used to understand species interactions with a
focus on plant-associated microbes. Learning the conceptual framework
and computational techniques of genomics to study the ecology of plant-
microbe interactions at the ecosystem level.
Prerequisites: (BI 311 with D- or better or BI 311H with D- or better) and
(BI 314 [D-] or BI 314H [D-] or BB 314 [D-] or BB 314H [D-])

BOT 460. FUNCTIONAL GENOMICS. (3 Credits)
Functional genomics describes a set of conceptual approaches and
associated laboratory techniques that rely on large-scale DNA sequence
datasets to investigate the function of, and interactions between, genes
as well as their RNA/protein products. This course will provide an
overview of these techniques, including a) approaches to predicting
protein function based on sequence analysis, b) large-scale genetic
approaches to identifying novel genotype-phenotype associations, and
c) transcriptomic, proteomic and metabolomic approaches that reveal
gene functions by measuring changes in abundance/modification of
associated RNA transcripts, proteins and metabolites.
Prerequisites: (BI 311 with C- or better or BI 311H with C- or better) and
(BI 314 [C-] or BI 314H [C-] or BB 314 [C-] or BB 314H [C-])

BOT 461. MYCOLOGY. (5 Credits)
A broad taxonomic survey of the fungi. Topics include life histories,
systematics, ecology, genetics, and ethnomycoLOGY. Participation on field
trips and the submission of a specimen collection are required. Lec/lab.
Recommended: (BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or
BI 213H)

BOT 465. LICHENOLOGY. (4 Credits)
Biology of lichens; includes structure, life histories, classification, and
ecology. Field trip fee. Lec/lab. Offered alternate years.
Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 466. BRYOLOGY. (4 Credits)
Biology of bryophytes; includes structure, life histories, classification, and
ecology. Field trip fee. Lec/lab. Offered alternate years.
Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 475. COMPARATIVE GENOMICS. (4 Credits)
Principles of comparative genomics. Methods for genome assembly
and annotation. Genomic approaches for the study of structural change,
whole genome duplication, gene family evolution, gene networks, gene
regulation and epigenetics. Lab topics include the analysis of next
generation sequencing data and conducting comparative genomic
analyses. Lec/lab.
Prerequisites: (BI 311 with D- or better or BI 311H with D- or better or CSS
430 with D- or better) and (BI 314 [D-] or BB 314 [D-] or BB 314H [D-])
Recommended: Basic working knowledge of cell and molecular biology
and genetics

BOT 476. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)
Introduction to management of large datasets (e.g., nucleic acids,
protein), computer programming languages, application of basic
mathematical functions, and assembly of computational pipelines
pertinent to life sciences.
Recommended: Cell and molecular biology or genetics. Familiarity with
text editing software and unix/linux operating system is advantageous

BOT 480. PHOTOSYNTHESIS AND PHOTOBIOLOGY. (3 Credits)
Explores the diverse use of light in biological systems, with particular
emphasis on photosynthesis. Lectures will discuss the nature of light,
light in the natural environment, light absorption in biological systems,
use of light energy for photosynthesis, communication, defense, motility,
and vision, as well as deleterious effects of light and its use for global
monitoring satellite systems.
Recommended: One course in plant physiology or ecology
BOT 488. ENVIRONMENTAL PHYSIOLOGY OF PLANTS. (3 Credits)
Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. Lec/lab.
Recommended: One course in plant physiology or one course in ecology.

BOT 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: BOT 499H
This course is repeatable for 16 credits.

BOT 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BOT 499
This course is repeatable for 16 credits.

BOT 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

BOT 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BOT 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 507. SEMINAR. (1-16 Credits)
Section 1: Departmental seminar (F, W, S). Section 2: Communication in Ecology (F). Section 3: Community and Habitat Analyses (W). Section 4: Lichens and Bryophytes Research (S). Weekly one-hour meetings for reporting and discussions of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Graded P/N.
This course is repeatable for 16 credits.

BOT 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 513. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 513/FOR 513.
Equivalent to: FOR 513
Recommended: BI 204 or BI 212 or BI 212H or BI 213 or BI 213H

BOT 514. AGROSTOLOGY. (4 Credits)
Classification and identification of grasses, with emphasis on the modern system of grass classification; laboratory practice in keying grass specimens to genus and species. Lec/lab.
Recommended: BOT 321

BOT 516. AQUATIC BOTANY. (4 Credits)
Taxonomy and ecology of aquatic vegetation, emphasizing freshwater and marine algae and the submergent vascular plants. Morphology, physiology, and classification of the algae; morphological and physiological adaptations of aquatic vascular plants; and primary production in aquatic ecosystems. Laboratory practice in the identification of local taxa. Field trips. Lec/lab.
Recommended: BI 213 or BI 213H

BOT 525. FLORA OF THE PACIFIC NORTHWEST. (3 Credits)
Vascular plant identification, terminology, and diagnostic characteristics of plant families. Lab emphasizes the use of keys for identification to the species level and ability to recognize by sight those plant families found in the Pacific Northwest. Field trips. Lec/lab.
Recommended: BOT 321

BOT 540. FIELD METHODS IN PLANT ECOLOGY. (4 Credits)
Concepts and tools for describing, monitoring, and experimenting on vegetation. Combines Web-based material, field experience at the student's location, and student projects.
Recommended: Course in ecology and a course in statistics.

BOT 542. PLANT POPULATION ECOLOGY. (3 Credits)
Ecological aspects of plant form and reproduction; demography and population modeling; species interactions, including competition, mutualism, and herbivory. Lec/lab.
Recommended: BOT 341

BOT 543. PLANT COMMUNITY ECOLOGY. (3 Credits)
The structure, diversity, and successional dynamics of terrestrial plant communities; methods of analysis. Lec/lab.
Recommended: BOT 341 or equivalent.

BOT 547. NUTRIENT CYCLING. (3 Credits)
Reviews and discusses ecosystem-level biogeochemical concepts for terrestrial and freshwater ecosystems, primarily by reading and discussing classic and current literature to determine the state-of-knowledge and uncertainties associated with it. Topics include root nutrient uptake mechanisms, soil chemical and biochemical transformations in different soil and ecosystems, measuring soil solution and watershed fluxes, soil organic matter formation and structure, the meaning of sustainability, the concept of N saturation in terrestrial ecosystems, and the use of natural abundance and tracer isotopes in ecosystem biogeochemistry. While forest biogeochemical processes will be emphasized, desert, aquatic, wetland, and prairie ecosystems will also be explored. CROSSLISTED as BOT 547/SOIL 547.
Equivalent to: FS 547, SOIL 547
Recommended: College-level chemistry and biology and one class in ecology (eg. BI 370) and/or soils (eg. SOIL 205)

BOT 550. PLANT PATHOLOGY. (5 Credits)
Causal agents of plant disease, diagnosis, pathogenesis, epidemiology, and disease management principles and strategies. Field trip. Lec/lab/rec.
Recommended: BI 213 or BI 213H

BOT 552. PLANT DISEASE MANAGEMENT. (4 Credits)
Analysis of host, pathogen, and environmental factors influencing the increase and spread of plant disease. Epidemiological theory will be used as a basis for developing and evaluating principles and concepts of plant disease management. Lec/lab/rec. Offered alternate years.
Recommended: BOT 350 or BOT 550

BOT 553. PLANT DISEASE DIAGNOSIS. (3 Credits)
Diagnosis of plant diseases and identification of causal agents. Laboratory practice in identification techniques. Observation of symptoms exhibited by diseased plants in greenhouse and field locations. Field trips. Lec/lab. Offered alternate years in summer term.
Recommended: BOT 350 or BOT 550

BOT 554. BIOLOGY OF NEMATODES. (4 Credits)
Survey of basic biology and biodiversity of nematodes. Includes taxonomy, identification, life cycles, ecology and pathology, and interaction with other organisms. Lec/lab. Offered alternate years. This course is repeatable for 4 credits.
Recommended: Plant pathology
BOT 556. PHYLOGENETICS. (4 Credits)
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Equivalent to: BI 556
Recommended: ST 511

BOT 558. ECO SYSTEMS GENOMICS. (3 Credits)
Genomic approaches used to understand species interactions with a focus on plant-associated microbes. Learning the conceptual framework and computational techniques of genomics to study the ecology of plant-microbe interactions at the ecosystem level.
Recommended: BI 311 and BI 314

BOT 560. FUNCTIONAL GENOMICS. (3 Credits)
Functional genomics describes a set of conceptual approaches and associated laboratory techniques that rely on large-scale DNA sequence datasets to investigate the function of, and interactions between, genes as well as their RNA/protein products. This course will provide an overview of these techniques, including a) approaches to predicting protein function based on sequence analysis, b) large-scale genetic approaches to identifying novel genotype-phenotype associations, and c) transcriptomic, proteomic and metabolomic approaches that reveal gene functions by measuring changes in abundance/modification of associated RNA transcripts, proteins and metabolites.
Recommended: (BI 311 or BI 311H) and (BI 314 or BI 314H)

BOT 561. MYCOLOGY. (5 Credits)
A broad taxonomic survey of the fungi. Topics include life histories, systematics, ecology, genetics, and ethnomycology. Participation on field trips and the submission of a specimen collection are required. Lec/lab.
Recommended: (BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or BI 213H)

BOT 565. LICHENOLOGY. (4 Credits)
Biology of lichens; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.
Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 566. BRYOLOGY. (4 Credits)
Biology of bryophytes; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.
Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 570. COMMUNITY STRUCTURE AND ANALYSIS. (4 Credits)
Quantitative methods for the analysis of biotic communities, including community concepts, estimation of community composition parameters, theoretical aspects of multivariate methods of analyzing species-importance data, and overview of multivariate tools; hands-on computer analysis of data sets. Lec/lab.
Equivalent to: BI 570
Recommended: BI 370 and (ST 412 or ST 512) and calculus

BOT 575. COMPARATIVE GENOMICS. (4 Credits)
Equivalent to: MCB 575
Recommended: Basic working knowledge of cell and molecular biology and genetics. BI 314 and (BI 311 or CSS 430)

BOT 576. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)
Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences. CROSSLISTED as BOT 576/MCB 576.
Equivalent to: MCB 576
Recommended: Cell and molecular biology or genetics. Familiarity with text editing software and unix/linux operating system is advantageous

BOT 580. PHOTOSYNTHESIS AND PHOTOBIOLOGY. (3 Credits)
Explores the diverse use of light in biological systems, with particular emphasis on photosynthesis. Lectures will discuss the nature of light, light in the natural environment, light absorption in biological systems, use of light energy for photosynthesis, communication, defense, motility, and vision, as well as deleterious effects of light and its use for global monitoring satellite systems.
Recommended: One course in plant physiology or ecology

BOT 588. ENVIRONMENTAL PHYSIOLOGY OF PLANTS. (3 Credits)
Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. Lec/lab.
Recommended: One course in plant physiology or ecology

BOT 590. SELECTED TOPICS IN MYCOLOGY. (1-3 Credits)
Advanced topics in mycology through analysis of current literature. Detailed study of an aspect of mycology beyond those covered in regular classes. Seminar and discussion format. This course is repeatable for 16 credits.
Recommended: BOT 461 or BOT 561

BOT 595. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

BOT 601. RESEARCH. (1-16 Credits)
Graded P/N. This course is repeatable for 16 credits.

BOT 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BOT 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 607. SEMINAR. (1 Credit)
Section 1. Departmental seminar. This course is repeatable for 16 credits.

BOT 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

BOT 651. MOLECULAR BASIS OF PLANT PATHOGENESIS. (3 Credits)
Analysis of current concepts in the physiology, biochemistry, and genetics of host-parasite interactions. Topics covered include specificity, recognition, penetration, toxin production, altered plant metabolism during disease, resistance mechanisms and regulatory aspects of gene expression during host-parasite interactions. Offered alternate years.
Equivalent to: MCB 651
Recommended: BOT 550
BOT 668. PLANT DISEASE DYNAMICS. (4 Credits)
Evaluation of processes affecting the dynamics of plant disease and pathogen populations through analysis of current literature. Students will be expected to conduct extensive reading and analysis of literature and to meet with the instructor for small group discussions. Offered alternate years.
Recommended: BOT 550 and ST 412

BOT 691. SELECTED TOPICS-PLANT ECOLOGY. (1-3 Credits)
Recent advances and developing problems in plant ecology, with critical evaluation of current literature. Topics vary from year to year.
This course is repeatable for 99 credits.
Recommended: Graduate-level ecology.

BOT 692. SELECTED TOPICS: PLANT PATHOLOGY. (1-3 Credits)
Selected topics concerning plant pathogens and plant disease processes, emphasizing current literature and theory. Topics vary from year to year.
Equivalent to: MCB 692
This course is repeatable for 99 credits.
Recommended: BOT 550

BOT 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Business Administration (BA)

BA 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students' understanding of the connection between theory and practice in their respective disciplines.

BA 101. BUSINESS NOW. (6 Credits)
Presents an integrated view of both established and entrepreneurial business organizations by studying their common processes and characteristics. Introduces theory and develops basic skills in the areas of management, finance, accounting and marketing. Lec/lab/rec.

BA 140. FINANCIAL LITERACY FOR COLLEGE LIFE. (2 Credits)
Helps you learn the fundamentals of personal finance. It is crucial you are prepared to be prudent managers of your financial resources, enabling you to achieve long- and short-term financial goals and security. In addition, this course will examine how your background experiences, values, goals, and decisions can impact your financial future.

BA 150. EXPLORING ENTREPRENEURSHIP. (1 Credit)
Participants are challenged with economic concepts and projects. Inspirational speakers address key topics concerning all aspects of business and leadership development. Students must be registered for Young Entrepreneurs Business Week Camp to receive credit for the course. Graded P/N.

BA 151. EXPLORING INVESTING. (1 Credit)
Students participating in Investing Week will learn about basic investment vehicles and the principles of evaluating a potential investment. Students will also learn how to understand the financial market system and how it affects their personal and business life. Students will be assigned a role as a junior analyst with Toots, Toots and Peabody, and critically assess the benefits and strengths of individual investment vehicles. Graded P/N.

BA 152. EXPLORING SOCIAL ENTREPRENEURSHIP. (1 Credit)
Provides an immersive experience regarding responsible business practices. In addition, from an entrepreneurial prospective, students have the opportunity to explore ways in which real social change is being conducted worldwide. Graded P/N.

BA 153. EXPLORING FINANCE. (1 Credit)
Students will establish real world financial literacy in a business capacity. Through this course, students will complete a case study involving a business financial plan.

BA 154. EXPLORING MARKETING. (1 Credit)
Students will understand the process of developing and executing a marketing plan in the context of a business model. Each student will participate in a Case Study conducting a small business-marketing plan.

BA 160. B-ENGAGED. (3 Credits)
Understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Opportunity to connect with faculty and peers with common interests in a supportive learning environment.
Equivalent to: BA 160H, BA 163

BA 160H. B-ENGAGED. (3 Credits)
Understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Opportunity to connect with faculty and peers with common interests in a supportive learning environment.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 160, BA 163

BA 161. INNOVATION NATION--AWARENESS TO ACTION. (3 Credits)
First course in a two-course sequence. Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market. Builds a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career.
Equivalent to: BA 161H, BA 167

BA 161H. INNOVATION NATION--AWARENESS TO ACTION. (3 Credits)
First course in a two-course sequence. Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market. Builds a foundation of entrepreneurial knowledge and gaining a competitive edge While becoming aware of your role in managing your own career.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 161, BA 167

BA 162. INNOVATION NATION--IDEAS TO REALITY. (3 Credits)
Second course in a two-course sequence. Topics include evaluating entrepreneurial capabilities, creativity and innovation, opportunity recognition, impression management, and responsible business practices. Continues a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market.
Prerequisites: BA 161 with C- or better or BA 161H with C- or better
Equivalent to: BA 162H, BA 168
BA 162H. INNOVATION NATION—IDEAS TO REALITY. (3 Credits)
Second course in a two-course sequence. Topics include evaluating entrepreneurial capabilities, creativity and innovation, opportunity recognition, impression management, and responsible business practices. Continues a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 161 with C- or better or BA 161H with C- or better
Equivalent to: BA 162, BA 168

BA 163. B-ENGAGED. (3 Credits)
The first term is a critical time for college students. B-Engaged helps the student transition to the OSU academic community and college learning expectations. B-Engaged will help the student understand and accomplish college-level academic work and explore OSU resources and options that will enhance their college experience and success. Additionally, B-Engaged is the student's opportunity to connect with a faculty member and peers with common interests in a supportive learning environment.
Equivalent to: BA 160, BA 160H

BA 167. LAUNCH PAD I. (3 Credits)
Begins a conversation on self-management, offering opportunities for active reflection on critical skill sets necessary for success in today's global market. Focused on building a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career. BA 167/BA 168 presents an integrated view of both established and entrepreneurial business organizations by studying their common processes and characteristics. The series introduces theory and develops basic skills in the areas of management, finance, accounting, and marketing. Departmental approval required.
Equivalent to: BA 161, BA 161H

BA 168. LAUNCH PAD II. (3 Credits)
Continues the conversation on self-management, focused on building a foundation of entrepreneurial knowledge and gaining a competitive edge while becoming aware of your role in managing your own career. BA 167/BA 168 presents an integrated view of both established and entrepreneurial business organizations by studying their common processes and characteristics. The series introduces theory and develops basic skills in the areas of management, finance, accounting, and marketing. Departmental approval required.
Prerequisites: BA 167 with C- or better
Equivalent to: BA 162, BA 162H

BA 170. BUSINESS INSIGHTS. (2 Credits)
The first term within a new university and/or major is a critical time for college students. Business Insights was developed to help you transition to the OSU College of Business academic community and learning expectations. Business Insights will help you understand and accomplish college-level academic work and explore OSU resources and options that will enhance your college experience and success. Additionally, Business Insights is your opportunity to connect with a faculty member and peers with common interests in a supportive learning environment.
Equivalent to: BA 280

BA 182. FIRST-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 182 – BA 184 is a series of three one-credit courses taken during a student's first year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help the student navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the first-year series provides incoming first-year students with the skills to be successful during college.
BA 182 covers personal development skills; BA 183 covers professional development skills; and BA 184 covers leadership development skills.

BA 183. FIRST-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II. (1 Credit)
BA 182 – BA 184 is a series of three one-credit courses taken during a student’s first year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help the student navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the first-year series provides incoming first-year students with the skills to be successful during college.
BA 182 covers personal development skills; BA 183 covers professional development skills; and BA 184 covers leadership development skills.

BA 184. FIRST-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III. (1 Credit)
BA 182 – BA 184 is a series of three one-credit courses taken during a student’s first year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help the student navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the first-year series provides incoming first-year students with the skills to be successful during college.
BA 182 covers personal development skills; BA 183 covers professional development skills; and BA 184 covers leadership development skills.

BA 199. SPECIAL STUDIES. (1-6 Credits)
Graded P/N.
This course is repeatable for 12 credits.

BA 210. INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N.
This course is repeatable for 16 credits.

BA 211. FINANCIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of external users, principally investors and creditors. Emphasis on the preparation and interpretation of financial statements, income recognition and determination, and asset valuation.
Prerequisites: (MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better) or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: BA 211H
BA 211H. FINANCIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of external users, principally investors and creditors. Emphasis on the preparation and interpretation of financial statements, income recognition and determination, and asset valuation.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 60
Equivalent to: BA 211

BA 211. MANAGERIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of management users with an emphasis on data accumulation for product costing, planning, and performance evaluation and control.
Prerequisites: BA 211 with C- or better or BA 211H with C- or better
Equivalent to: BA 211H

BA 213H. MANAGERIAL ACCOUNTING. (4 Credits)
Accounting information from the perspective of management users with an emphasis on data accumulation for product costing, planning, and performance evaluation and control.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 211 with C- or better or BA 211H with C- or better
Equivalent to: BA 213

BA 215. FUNDAMENTALS OF ACCOUNTING. (4 Credits)
Looks at how the accounting model reflects business transactions and events. Students are introduced to both financial and managerial accounting and the creation, interpretation, and analysis of financial statements. In addition, students obtain an understanding of the determination, organization, and management of costs and revenues including management decisions based upon this information.
Equivalent to: BA 215H, BA 315

BA 223. PRINCIPLES OF MARKETING. (4 Credits)
Covers concepts and principles used by marketing professionals. Designed explicitly for business majors, it’s an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: BA 223H, BA 390, BA 390H

BA 223H. PRINCIPLES OF MARKETING. (4 Credits)
Covers concepts and principles used by marketing professionals. Designed explicitly for business majors, it’s an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.
Attributes: HNRS – Honors Course Designator
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: BA 223, BA 390, BA 390H

BA 230. BUSINESS LAW I. (4 Credits)
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.
Equivalent to: BA 230, BA 330

BA 230H. BUSINESS LAW I. (4 Credits)
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 230

BA 233. LEGAL ENVIRONMENT OF BUSINESS. (2 Credits)
Equivalent to: BA 233H

BA 233H. LEGAL ENVIRONMENT OF BUSINESS. (2 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 233

BA 240. FINANCE. (4 Credits)
Introduces basic tools of finance and applications of financial theory in use today. These tools include rates of return, the time value of money, those that can be applied to capital budgeting decisions, and the logic and fundamentals of financial statements. It is designed to enhance a student’s approach to financial decision-making and emphasizes quantitative approaches to decision making. This course will also introduce students to equity and debt markets and securities, and serves as a stepping stone to advanced courses in finance.
Prerequisites: (BA 211 with C- or better or BA 211H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 240H, BA 360, BA 360H

BA 240H. FINANCE. (4 Credits)
Introduces basic tools of finance and applications of financial theory in use today. These tools include rates of return, the time value of money, those that can be applied to capital budgeting decisions, and the logic and fundamentals of financial statements. It is designed to enhance a student’s approach to financial decision-making and emphasizes quantitative approaches to decision making. This course will also introduce students to equity and debt markets and securities, and serves as a stepping stone to advanced courses in finance.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 211 with C- or better or BA 211H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 240, BA 360, BA 360H

BA 253. PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to improve the ability of students to describe their accomplishments and sell their ideas in situations like professional networking, company meetings, response to proposals for services, and interviews. It teaches writing skills and workplace integration for new jobs. Particular emphasis is put on verbal communication and preparation for verbal communication. Students will learn to create career plans that require them to research career options and potential employers, and prepare a developmental roadmap that will lead them to success within the chosen profession.
Prerequisites: (BA 101 with C- or better or BA 162 with C- or better or DHE 160 with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-])
Equivalent to: BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253
BA 253H. PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to improve the ability of students to describe their accomplishments and sell their ideas in situations like professional networking, company meetings, response to proposals for services, and interviews. It teaches writing skills and workplace integration for new jobs. Particular emphasis is put on verbal communication and preparation for verbal communication. Students will learn to create career plans that require them to research career options and potential employers, and prepare a developmental roadmap that will lead them to success within the chosen profession.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 253, BA 275H, BA 276

BA 255. FOUNDATIONS OF STATISTICAL INFERENCE. (4 Credits)
An introductory course on statistical inference with an emphasis on business applications. Coverage includes descriptive statistics, random variables, probability distributions, sampling and sampling distributions, statistical inference for means and proportions using one and two samples, and linear regression analysis.
Prerequisites: MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or Math Placement - ALEKS with a score of 046
Equivalent to: BA 275, BA 276

BA 260. INTRODUCTION TO ENTREPRENEURSHIP. (4 Credits)
Topics include evaluating entrepreneurial capabilities, creativity, business plan creation, opportunity assessment and feasibility analysis, business implementation, new product introduction, and seeking funds.
Equivalent to: BA 260H

BA 260H. INTRODUCTION TO ENTREPRENEURSHIP. (4 Credits)
Topics include evaluating entrepreneurial capabilities, creativity, business plan creation, opportunity assessment and feasibility analysis, business implementation, new product introduction, and seeking funds.
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 260

BA 270. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Introduces and integrates some core concepts from Operations Management (OM) and Business Information System (BIS) disciplines by introducing a process-oriented view of the flows of materials, information, products and services through and across organizational functions. Helps students to: identify information-bearing events and actors, model and analyze business processes, assess and improve process efficiency, recognize probabilistic components of business processes and understand the interactions between human behavior and process design. Hands-on, case-based assignments allow for practicing some principles and concepts addressed in the course.
Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 270H, BA 302, BA 302H

BA 270H. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Introduces and integrates some core concepts from Operations Management (OM) and Business Information System (BIS) disciplines by introducing a process-oriented view of the flows of materials, information, products and services through and across organizational functions. Helps students to: identify information-bearing events and actors, model and analyze business processes, assess and improve process efficiency, recognize probabilistic components of business processes and understand the interactions between human behavior and process design. Hands-on, case-based assignments allow for practicing some principles and concepts addressed in the course.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 270, BA 302, BA 302H

BA 272. BUSINESS APPLICATION DEVELOPMENT. (4 Credits)
Introduction to business programming with C#.NET. Beginning programming skills and concepts, .NET programming environment, object-oriented and event-oriented models, and console applications.
BA 282. PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 282, taken during fall term of the second year, helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: DSGN 282

BA 283. CREATIVITY, CULTURE, AND THE WORKPLACE. (1 Credit)
Part of Blueprint – a 12 course professional development course series to guide the student from college to career. Topics include exploration of students’ unique talents; understanding of how teams as well as organizations can benefit from diverse and inclusive communities.
Equivalent to: DSGN 283

BA 284. PERSONAL, PROFESSIONAL AND LEADERSHIP DEVELOPMENT III. (1 Credit)
BA 284, taken during spring term of the second year, course helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: DSGN 284

BA 290. INTRODUCTION TO CAREERS IN MARKETING. (3 Credits)
Explores marketing through the perspectives of current marketing professionals. Introductory language and principles of marketing are introduced and examined through real world examples. Presents various careers within marketing.

BA 291. BLUEPRINT - TRANSFER TRANSITIONS - SECOND YEAR FALL EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to OSU and the College of Business’ component, and Professional Development content, including business writing and verbal communication. Appropriate for second year external transfer students matriculating to the College in the Fall term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 294, BA 295, BA 353, BA 382, BA 384, BA 385, DSGN 253

BA 293. BLUEPRINT-TRANSFER TRANSITIONS-SECOND YEAR SPRING EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis. Appropriate for second year external transfer students matriculating to the College in the Spring term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 294. BLUEPRINT - TRANSFER TRANSITIONS - SECOND YEAR FALL INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication. Appropriate for second year internal transfer students matriculating to the College in the Fall term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 295. BLUEPRINT - TRANSFER TRANSITIONS - SECOND YR WINTER INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis. Appropriate for second year internal transfer students matriculating to the College in the Winter term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 353, BA 381, BA 382, BA 384, BA 385, DSGN 253

BA 296. BLUEPRINT-TRANSFER TRANSITIONS-SECOND YEAR SPRING INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture. Appropriate for second year internal transfer students matriculating to the College in the Spring term.

BA 302. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Integrates core concepts from Business Information Systems (BIS) with those of Operations Management and introduces a process-oriented view of the flows of materials, information and services through and across organizations. The course helps students identify information-bearing events, assess and improve process efficiency, learn to model and analyze business processes, and understand the interactions between human behavior and process design. Hands-on, case-based assignments and labs allow students to practice the principles addressed.
Prerequisites: BA 275 with C- or better or BA 276 with C- or better
Equivalent to: BA 270, BA 270H, BA 302H

BA 302H. BUSINESS PROCESS MANAGEMENT. (4 Credits)
Integrates core concepts from Business Information Systems (BIS) with those of Operations Management and introduces a process-oriented view of the flows of materials, information and services through and across organizations. The course helps students identify information-bearing events, assess and improve process efficiency, learn to model and analyze business processes, and understand the interactions between human behavior and process design. Hands-on, case-based assignments and labs allow students to practice the principles addressed.
Prerequisites: BA 275 with C- or better or BA 276 with C- or better
Equivalent to: BA 270, BA 270H, BA 302

BA 311. THIRD-YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 311 – BA 313 is a series of three one-credit courses taken during a student’s third year. These courses, along with the respective 1st, 2nd and 4th year one-credit courses, are designed to help students navigate college successfully and develop lifelong skills that are practical, meaningful, and useful. These courses revolve around personal, professional and leadership development, and the third-year series provides students with skills related to team work and team leadership. BA 311 focuses on diversity and inclusion; BA 312 focuses on teamwork and career preparation; and BA 313 focuses on team leadership.
BA 312. THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT II. (1 Credit)
BA 311 – BA 313 is a series of three one-credit courses taken during a student’s third year. These courses, along with the respective 1st, 2nd and 4th year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third-year series provides students with skills related to team work and team leadership. BA 311 focuses on diversity and inclusion; BA 312 focuses on teamwork and career preparation; and BA 313 focuses on team leadership.

BA 313. THIRD YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT III. (1 Credit)
BA 311 – BA 313 is a series of three one-credit courses taken during a student’s third year. These courses, along with the respective 1st, 2nd and 4th year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third-year series provides students with skills related to team work and team leadership. BA 311 focuses on diversity and inclusion; BA 312 focuses on teamwork and career preparation; and BA 313 focuses on team leadership.

BA 314. SUSTAINABLE BUSINESS OPERATIONS. (4 Credits)
Operations are the processes by which an organization transforms inputs (e.g., labor, material, and knowledge) into outputs (products and services). Operations managers are responsible for designing, running and improving the processes and systems to efficiently accomplish this for production or service businesses. This course focuses on the concepts and tools employed by operations managers to provide their organization a competitive advantage. Topics include statistical tools and quantitative methods (descriptive statistics, probabilities, sampling, interval estimation and hypothesis testing) and operations management concepts (strategies, forecasting, process design, capacity utilization, quality systems, supply chain management, inventory management, resource planning, sustainability and lean systems.)

BA 315. ACCOUNTING FOR DECISION MAKING. (4 Credits)
Looks at how the accounting model reflects business transactions and events. Students are introduced to both financial and managerial accounting and the creation, interpretation, and analysis of financial statements. In addition, students obtain an understanding of the determination, organization, and management of costs and revenues including management decisions based upon this information.
Equivalent to: BA 215
Recommended: Third-year (junior) standing

BA 330. LEGAL ENVIRONMENT OF BUSINESS. (4 Credits)
Nature and function of law in our business society. Obligations arising out of agency, contract formation and breach, crimes, torts, warranty, regulation of competition, and international aspects thereof.
Equivalent to: BA 230, BA 230H
Recommended: Third-year (junior) standing

BA 333. LEGAL AND ETHICAL BUSINESS SOLUTIONS. (2 Credits)
Legal and ethical regulations of U.S. and global business organizations including financial, human resources, operations and marketing functions. Emphasizes legal and ethical strategies for entrepreneurs including business entity selection, raising capital and managing intellectual property.
Prerequisites: (BA 230 with C- or better or BA 233 with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 333H

BA 333H. LEGAL AND ETHICAL BUSINESS SOLUTIONS. (2 Credits)
Legal and ethical regulations of U.S. and global business organizations including financial, human resources, operations and marketing functions. Emphasizes legal and ethical strategies for entrepreneurs including business entity selection, raising capital and managing intellectual property.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 230 with C- or better or BA 233 with C- or better) and (ECON 201 [C-] or ECON 201H [C-])
Equivalent to: BA 333

BA 337. INTERNATIONAL BUSINESS. (4 Credits)
Integrated view of international business including current patterns of international business, socioeconomic and geopolitical systems within countries as they affect the conduct of business, major theories explaining international business transactions, financial forms and institutions that facilitate international transactions, and the interface between nation states and the firms conducting foreign business activities.
Prerequisites: (ECON 202 with C- or better or ECON 202H with C- or better) and (BA 230 [C-] or BA 230H [C-] or BA 330 [C-])
Equivalent to: BA 347H

BA 347H. INTERNATIONAL BUSINESS. (4 Credits)
Integrated view of international business including current patterns of international business, socioeconomic and geopolitical systems within countries as they affect the conduct of business, major theories explaining international business transactions, financial forms and institutions that facilitate international transactions, and the interface between nation states and the firms conducting foreign business activities.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ECON 202 with C- or better or ECON 202H with C- or better) and (BA 230 [C-] or BA 230H [C-] or BA 330 [C-])
Equivalent to: BA 347

BA 348. INTERNATIONAL EXCHANGE ORIENTATION. (1 Credit)
Consists of large-group sessions as well as small-group break-out sessions for each country individually. It is vital to attend all sessions as valuable information pertaining to your study abroad opportunity will be presented. Graded P/N.

BA 349. IMPACT OF CULTURE ON BUSINESS. (1 Credit)
A requirement of all students participating in a College of Business-approved international exchange program and for completing the College of Business International Business option. The major emphasis is for students to reflect on their experience while studying, living and traveling in a foreign culture and for them to determine how the foreign culture impacts how they would conduct business in that country. Graded P/N.
Prerequisites: BA 348 (may be taken concurrently) with C- or better

BA 351. MANAGING ORGANIZATIONS. (4 Credits)
A systems perspective to understanding the management functions of planning, organizing, leading and controlling. Ethical and diversity issues are addressed as they are relevant in entrepreneurial and established ventures.
BA 352. MANAGING INDIVIDUAL AND TEAM PERFORMANCE. (4 Credits)
Diagnose individual and small-group behavior and develop skill in improving individual and small-group performance in entrepreneurial and established ventures. Emphasis on professional skill development and the practical application of theory and research. Concepts of ethics, diversity and cross-cultural relations are integrated throughout the course.
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 352H

BA 352H. MANAGING INDIVIDUAL AND TEAM PERFORMANCE. (4 Credits)
Diagnose individual and small-group behavior and develop skill in improving individual and small-group performance in entrepreneurial and established ventures. Emphasis on professional skill development and the practical application of theory and research. Concepts of ethics, diversity and cross-cultural relations are integrated throughout the course.
Attributes: HNRS – Honors Course Designator
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 352

BA 353. *PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to improve the ability of students to describe their accomplishments and sell themselves in situations like professional networking, company meetings, response to proposals for services, and interviews. Emphasizes writing skills, workplace integration, verbal communication, and preparation of developmental roadmaps that will lead students to success within their chosen profession. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 381, BA 382, BA 384, BA 385, DSGN 253
Recommended: Junior standing

BA 354. *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces contemporary issues that business professionals face making ethical and socially responsible decisions in an increasingly fast-paced, transparent, and global environment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better or COMM 218 with C- or better or COMM 218H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 354H, MGMT 459

BA 354H. *MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces contemporary issues that business professionals face making ethical and socially responsible decisions in an increasingly fast-paced, transparent, and global environment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (COMM 111 with C- or better or COMM 111H with C- or better or COMM 114 with C- or better or COMM 114H with C- or better) and (WR 222 [C-] or WR 323 [C-] or WR 327 [C-] or WR 327H [C-] or HC 199 [C-])
Equivalent to: BA 354, MGMT 459

BA 357. OPERATIONS MANAGEMENT. (4 Credits)
Decision making in managing the production of goods and services: product planning, process planning, facility planning, control of quantity, cost and quality. Special emphasis on exponential forecasting, inventory management, work methods, project management, productivity improvement, and international comparisons.
Prerequisites: BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better
Equivalent to: BA 357H

BA 357H. OPERATIONS MANAGEMENT. (4 Credits)
Decision making in managing the production of goods and services: product planning, process planning, facility planning, control of quantity, cost and quality. Special emphasis on exponential forecasting, inventory management, work methods, project management, productivity improvement, and international comparisons.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better
Equivalent to: BA 357

BA 360. INTRODUCTION TO FINANCIAL MANAGEMENT. (4 Credits)
Explore the issues facing a financial manager in new business ventures, small businesses, and corporations. Focus on the role of the financial manager in business settings, explores the functions of a financial manager in financial analysis, forecasting, planning, and control; asset and liability management; capital budgeting; and raising funds for new business ventures, small businesses, and corporations.
Prerequisites: (BA 213 with C- or better or BA 213H with C- or better or BA 215 with C- or better or BA 215H with C- or better or BA 315 with C- or better) and (ECON 201 [C-] or ECON 201H [C-] or AEC 250 [C-] or AEC 250H [C-])
Equivalent to: BA 240, BA 240H, BA 360H

BA 360H. INTRODUCTION TO FINANCIAL MANAGEMENT. (4 Credits)
Explore the issues facing a financial manager in new business ventures, small businesses, and corporations. Focus on the role of the financial manager in business settings, explores the functions of a financial manager in financial analysis, forecasting, planning, and control; asset and liability management; capital budgeting; and raising funds for new business ventures, small businesses, and corporations.
Attributes: HNRS – Honors Course Designator
Prerequisites: (BA 213 with C- or better or BA 213H with C- or better or BA 215 with C- or better or BA 215H with C- or better or BA 315 with C- or better) and (ECON 201 [C-] or ECON 201H [C-] or AEC 250 [C-] or AEC 250H [C-])
Equivalent to: BA 240, BA 240H, BA 360
BA 362. SOCIAL ENTREPRENEURSHIP AND SOCIAL INITIATIVES. (4 Credits)
The core concepts of entrepreneurship, using entrepreneurship to craft innovative responses to social problems. Entrepreneurial skills are as valuable in the social sector as they are in business. Includes both profit and non-profit firms that have programs designed to create social value.

BA 363. TECHNOLOGY AND INNOVATION MANAGEMENT. (4 Credits)
Introduces students to the fundamentals of managing innovation and technology toward the production of intellectual assets; how innovations are created, evaluated and leveraged within business strategy; and how innovation is managed within various business environments.
Prerequisites: BA 260 with C- or better or BA 260H with C- or better

BA 365. FAMILY BUSINESS MANAGEMENT. (4 Credits)
Focuses on the opportunities and the problems characteristic of family businesses: entrepreneurship, management succession, transfer of ownership, mixing family and business roles, family conflicts, personnel issues, non-family employees, and outside advisors.

BA 367. LAUNCH ACADEMY. (3 Credits)
The Oregon State Launch Academy is an incubator for student entrepreneurs who want to be immersed in an innovative, high-energy environment that promotes the creation, evolution and implementation of business ideas. Launch Academy students earn academic credit for working on their businesses and have access to seed funding, prototyping equipment, co-working space, mentoring and training to help them advance their ideas. Launch Academy students learn about developing new products or services, marketing their ideas, building teams and securing funding, among other critical elements of entrepreneurial success.

BA 368. ADVANCED LAUNCH ACADEMY. (1-3 Credits)
The Oregon State Launch Academy is an incubator for student entrepreneurs who want to be immersed in an innovative, high-energy environment that promotes the creation, evolution and implementation of business ideas. Launch Academy students earn academic credit for working on their businesses and have access to seed funding, prototyping equipment, co-working space, mentoring and training to help them advance their ideas. In BA 368 Advanced Launch Academy students/teams will receive coaching from the instructor to move their business ideas forward. Students will secure and engage mentors, complete and test prototypes of their ideas, market their ideas, and prepare to secure funding for their ideas. Graded P/N.
Prerequisites: BA 367 with C- or better
This course is repeatable for 12 credits.

BA 370. BUSINESS INFORMATION SYSTEMS OVERVIEW. (4 Credits)
Introduce students to the field of information management. Topics include information systems technology, the strategic role of IT, the business applications of networks, databases and Internet technologies, and the development and implementation of information systems. Use relational database models to design a real-world case study.
Prerequisites: BA 270 with C- or better or BA 270H with C- or better or BA 302 with C- or better

BA 371. BUSINESS DATA MANAGEMENT. (4 Credits)
Exploration of business data management technologies including but not limited to relational database modeling, data retrieval, database triggers and stored procedures, NoSQL databases, programmatic database querying.
Prerequisites: BA 272 with C- or better and (ACTG 378 [C-] or ACTG 378H [C-] or BA 370 [C-])

BA 372. BUSINESS INFORMATION SYSTEMS DESIGN AND DEVELOPMENT. (4 Credits)
Logical and physical design of computer-based information systems; tools and techniques that underlie the design processes. Design of an enterprise information system with CASE tools. Alternative approaches to systems design with emphasis on object-orientation. Lec/rec.
Prerequisites: BA 272 with C- or better and (ACTG 378 [C-] or ACTG 378H [C-] or BA 370 [C-])
Recommended: BA 371

BA 375. APPLIED QUANTITATIVE METHODS. (4 Credits)
Introduces students to the basics of data science and data analytics for handling of large-scale databases. It provides an overview of the main data-analytic techniques and topics including data visualization, linear and nonlinear regression analysis, time series analysis and forecasting, classification, and clustering methods.
Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 375H

BA 375H. APPLIED QUANTITATIVE METHODS. (4 Credits)
Introduces students to the basics of data science and data analytics for handling of large-scale databases. It provides an overview of the main data-analytic techniques and topics including data visualization, linear and nonlinear regression analysis, time series analysis and forecasting, classification, and clustering methods.
Attributes: HNRS – Honors Course Designator
Prerequisites: BA 275 with C- or better or BA 275H with C- or better
Equivalent to: BA 375

BA 376. APPLIED QUANTITATIVE METHODS. (2 Credits)
An in-depth discussion on advanced quantitative methods most relevant to business students. Topics may include regression analysis, time series and forecasting, design of experiments, simulations, decision analysis, survey data analysis, data mining and computationally intensive statistical methods.
Prerequisites: BA 276 with C- or better

BA 381. PERSONAL AND PROFESSIONAL DEVELOPMENT. (4 Credits)
Designed to help students transition to the OSU and COB communities, identify and employ academic success strategies, and start the process of career planning and development. Teaches students how to set financial goals. Credit may not be received for equivalent courses BA 353 or BA 253.
Prerequisites: BA 101 with C- or better
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 382, BA 384, BA 385, DSGN 253

BA 382. BLUEPRINT - TRANSFER TRANSITIONS - THIRD YR WINTER EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a welcome to OSU and College of Business component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit. Appropriate for third year external transfer students matriculating to the College in the Winter term.
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 384, BA 385, DSGN 253
BA 383. BLUEPRINT-TRANSFER TRANSITIONS-THIRD YEAR SPRING EXTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to OSU and College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit; Investing, Taxes, Credit/Banking. Appropriate for third year external transfer students matriculating to the College in the Spring term.

BA 384. BLUEPRINT - TRANSFER TRANSITIONS - THIRD YEAR FALL INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; and Paying for College. Appropriate for third year internal transfer students matriculating to the College in the Fall term.

BA 385. BLUEPRINT - TRANSFER TRANSITIONS - THIRD YR WINTER INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit. Appropriate for third year internal transfer students matriculating to the College in the Winter term.

BA 386. BLUEPRINT-TRANSFER TRANSITIONS-THIRD YEAR SPRING INTERNAL. (4 Credits)
Customized entry course for transfer students that provides a ‘welcome to the College of Business’ component, and Professional Development content, including business writing and verbal communication; CliftonStrengths; Gap Analysis; Corporate Culture; Map to Graduation; Paying for College; Managing Professional Career Opportunities and Personal Fit; Investing. Taxes, Credit/Banking. Appropriate for third year internal transfer students matriculating to the College in the Spring term.

BA 390. MARKETING. (4 Credits)
Consumer and industrial markets, and activities and enterprises involved in distributing products to those markets. Objective is to develop an understanding of distribution processes, marketing problems, and marketing principles.
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better or (AREC 250 with C- or better or AEC 250 with C- or better)
Equivalent to: BA 223, BA 223H, BA 390H

BA 390H. MARKETING. (4 Credits)
Consumer and industrial markets, and activities and enterprises involved in distributing products to those markets. Objective is to develop an understanding of distribution processes, marketing problems, and marketing principles.
Attributes: HNRS – Honors Course Designator
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better or (AREC 250 with C- or better or AEC 250 with C- or better)
Equivalent to: BA 223, BA 223H, BA 390

BA 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

BA 405. READING AND CONFERENCE. (1-16 Credits)
Supervised individual work in some field of special application and interest. Subjects chosen must be approved by professor in charge. This course is repeatable for 16 credits.

BA 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

BA 407. SEMINAR. (1-16 Credits)
Equivalent to: BA 407H
This course is repeatable for 16 credits.

BA 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: BA 407

BA 410. BUSINESS INTERNSHIP. (1-12 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N. This course is repeatable for 16 credits.

BA 411. FOURTH YEAR PERSONAL PROFESSIONAL LEADERSHIP DEVELOPMENT I. (1 Credit)
BA 411–BA 413 is a series of three one-credit courses taken during a student?s fourth year. These courses, along with the respective 1st, 2nd and 3rd year one-credit courses, are designed to help students navigate college successfully, and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional, leadership development, and the fourth-year series continues to provide students with career-related skills, and provides students with skills to be successful in life. BA 411 focuses on career placement skills; BA 412 focuses on self-leadership; and BA 413 focuses on work-life balance, financial literacy, and networking.

BA 412. THE DESIGN THINKING CHALLENGE. (1 Credit)
Part of Blueprint – a 12 course professional development course series to guide the student from college to career. Topics include basic methodologies of design thinking and integration of design thinking into business processes. Participation in a cross-campus Design Thinking Challenge.

BA 413. FINANCIAL PLANNING II. (1 Credit)
Part of Blueprint – a 12 course professional development course series to guide the student from college to career. Fourth of four courses dedicated to the foundations of professional financial planning so the student can have the tools needed to successfully manage their career pathway. Equivalent to: DSGN 413

BA 432. *ENVIRONMENTAL LAW, SUSTAINABILITY AND BUSINESS. (3 Credits)
Explores fundamental business, legal, and policy issues raised by environmental law, sustainable business practices, and clean energy policies, and their impact on business and management practices.
Attributes: CSGI – Core, Synth, Global Issues

BA 447. TOPICS IN INTERNATIONAL BUSINESS. (1-4 Credits)
Analysis of current topics in international business. Topics will vary from term to term.
Prerequisites: BA 347 with C- or better or BA 347H with C- or better
BA 451. SUPPLY AND SOURCING MANAGEMENT. (3 Credits)
Focus on effectively using operations and supply chain management to make sourcing and supply decisions in international business contexts. Topics include purchasing/procurement procedures and policy, supply organization, specifications, sourcing strategy, supplier evaluation, competitive bidding, and e-procurement. Global contexts and environmentally and socially responsible supply management are emphasized.

Prerequisites: BA 357 with C- or better or BA 357H with C- or better

BA 454. LEAN ENTERPRISE MANAGEMENT AND CAPSTONE. (3 Credits)
Analyze business cases that address global value creation and production/delivery systems. Complete integrated business projects to identify critical operations and supply chain management issues, apply multidisciplinary knowledge, analyze and evaluate alternative solutions and write and present reports recommending firm strategies. International business and cross-cultural competencies are emphasized.

Prerequisites: BA 459 with C- or better and MGMT 457 [C-]

BA 458. INNOVATION AND NEW PRODUCT DEVELOPMENT. (4 Credits)
Strategic management of an organization's system and technologies in support of innovation and new product/service development. Application experience with new product/service development process using problem solving skills, information management, and critical thinking.

Prerequisites: BA 223 with C- or better or BA 223H with C- or better or BA 390 with C- or better or BA 390H with C- or better

BA 459. SERVICE OPERATIONS MANAGEMENT. (3 Credits)
Focus on the management of global service operations including designing and managing systems to coordinate global information and material flows within and between firms in a supply chain. Covers planning operations, evaluating system alternatives, designing and researching global supply networks, examining complex adaptive systems and evaluating value stream synchronization.

Prerequisites: (BA 375 with C- or better or BA 375H with C- or better) and BA 451 [C-]

BA 460. VENTURE MANAGEMENT. (4 Credits)
Entrepreneurial and innovation processes applied to new business start-ups, existing small businesses, and new ventures within larger organizations; new venture planning, project management, and productivity improvement. Cases and projects are used to apply concepts and to develop communication skills.

Prerequisites: (BA 260 with C- or better or BA 260H with C- or better) and (BA 351 [C-] or BA 352 [C-] or BA 352H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-])

BA 463. FAMILY ENTERPRISE GOVERNANCE. (4 Credits)
Builds on the introductory family business management course to examine the required elements of a successful enterprise, a diversified and multigenerational organization comprised of multiple business lines.

Prerequisites: BA 365 with C- or better

BA 464. NEW VENTURE FINANCING. (4 Credits)
Explore financial issues facing entrepreneurial business ventures: cash flow and budgets, financial analysis, financial statement forecasting, financial controls, asset management, and understanding the funding options at different points in the business life cycle including SBA loans, angel investment, venture capital, bank loans, and going public.

Prerequisites: (BA 260 with C- or better or BA 260H with C- or better) and (BA 240 [C-] or BA 240H [C-] or BA 360 [C-] or BA 360H [C-] or FIN 340 [C-] or FIN 340H [C-])

BA 465. *SYSTEMS THINKING AND PRACTICE. (4 Credits)
Hard and soft system theories examined, methods and techniques for dealing with real-world problems; skills and dialogue techniques to identify mindsets, define problems, and explore alternative pathways for solutions. (Bacc Core Course)

Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: BA 465H, ENGR 465, H 490, HORT 490

BA 465H. *SYSTEMS THINKING AND PRACTICE. (4 Credits)
Hard and soft systems theories are examined, including methods and techniques for dealing with real-world problems; skills and dialogue techniques to identify mindsets, define problems, and explore alternative pathways for solutions.

Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator

Equivalent to: BA 465

BA 466. INTEGRATIVE STRATEGIC EXPERIENCE. (4 Credits)
Provides students with an overview of the basic concepts in strategic management. Students learn frameworks and models to understand and analyze a firm's external environment and internal resources in an effort to create sustainable competitive advantages. Analysis and critique of conventional conceptions of business ethics. Evaluation of ethical issues involving businesses at firm, national, and international levels.

Prerequisites: ((BA 240 with C- or better or BA 240H with C- or better or FIN 340 with C- or better or FIN 340H with C- or better or BA 360 with C- or better or BA 360H with C- or better) and (BA 352 [C-] or BA 352H [C-]) and (BA 357 [C-] or BA 357H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-])

Equivalent to: BA 466H

BA 466H. INTEGRATIVE STRATEGIC EXPERIENCE. (4 Credits)
Provides students with an overview of the basic concepts in strategic management. Students learn frameworks and models to understand and analyze a firm's external environment and internal resources in an effort to create sustainable competitive advantages. Analysis and critique of conventional conceptions of business ethics. Evaluation of ethical issues involving businesses at firm, national, and international levels.

Attributes: HNRS – Honors Course Designator

Prerequisites: ((BA 240 with C- or better or BA 240H with C- or better or FIN 340 with C- or better or FIN 340H with C- or better or BA 360 with C- or better or BA 360H with C- or better) and (BA 352 [C-] or BA 352H [C-]) and (BA 357 [C-] or BA 357H [C-]) and (BA 223 [C-] or BA 223H [C-] or BA 390 [C-] or BA 390H [C-])

Equivalent to: BA 466

BA 467. NEW VENTURE LABORATORY. (4 Credits)
Entrepreneurship capstone course. Fully develop a business plan including product specs with prototype, financial analysis, market analysis, marketing plan, management structure and proposed financing.

Prerequisites: (BA 387 with C- or better or BA 357H with C- or better) and BA 458 [C-]

Equivalent to: ENGR 467

BA 468. TECHNOLOGY COMMERCIALIZATION. (2-4 Credits)
''Hands on' class in which students will exercise commercialization concepts on recently awarded Oregon State University patents or individual commercialization projects. Students will learn a process and tools to assess the business viability of a technical idea, and to develop the best business approach for commercialization.

Prerequisites: BA 363 with C- or better

Equivalent to: BA 468X

This course is repeatable for 8 credits.
BA 474. DATA MANAGEMENT. (3 Credits)
Familiarize students with the major activities involved in collecting and managing data for a data analytics project, including extracting information from relational databases, mapping organizational requirements into a data design, transforming data into information, and exploring basic concepts underlying noSQL data management and analysis methods.
**Prerequisites:** BA 481 with C- or better or BA 483 with C- or better

BA 475. DATA EXPLORATION AND VISUALIZATION. (3 Credits)
Exploring and visualizing data in business analytics projects. We will focus on exploring and wrangling data to discover interesting analysis questions and prepare for other analytics activities. We will pay special attention to data visualization methods and their overall place in data science and business analytics.
**Prerequisites:** BA 481 with C- or better or BA 483 with C- or better

BA 476. DATA AND TEXT MINING. (3 Credits)
Introduces the concepts and applications of data and text mining. As the core of business analytics, mining structured and unstructured information is critical for better decision making by deriving valuable insights from your enterprise data repositories regardless of source or format. It allows deep, rich analysis of information. Data/text mining can help organizations surface undetected problems, fix process inefficiencies, improve customer service and corporate accountability, reduce operating costs and risks and discover new revenue opportunities. Student groups will implement a comprehensive project of data/text analytics.
**Prerequisites:** BA 474 with C- or better and BA 475 [C]  
**BA 477. SUPPLY CHAIN ANALYTICS. (3 Credits)**
Explores modeling methods for design, analysis, execution and integration of supply chains. Introduces students to a variety of modeling and optimization techniques for the analysis of strategic, tactical and operational supply chain problems, including demand forecasting, risk analysis, revenue management, distribution and facility location.
**Prerequisites:** (BA 357 with C- or better or BA 357H with C- or better) and (BA 375 [C-] or BA 375H [C-])

BA 479. BUSINESS TELECOMMUNICATIONS AND NETWORKING. (4 Credits)
Provide a fundamental understanding of the five-layer Internet model and its effects on the business environment. Planning and managing networks in support of enterprise-wide computing. Assignments involve server hardware and software configurations including DNS/DHCP server configurations, addition of clients to a network, and creating/managing user accounts.
**Prerequisites:** ACTG 378 with C- or better or ACTG 378H with C- or better

BA 480. INFORMATION SYSTEMS SECURITY. (4 Credits)
Course emphasis is on security risk mitigation methods and procedures such as access control, identity management, intrusion prevention and detection, network and physical security, etc. These and other topics will be placed in both the operational and strategic context of the business. The course also addresses several IS governance and IS security frameworks within which the various security concepts, aspects, policies and procedures can be viewed and discussed.
**Prerequisites:** BA 272 with C- or better and (ACTG 378 [C-] or ACTG 378H [C-]) and BA 479 [C-]

BA 481. INTRODUCTION TO BUSINESS ANALYTICS. (4 Credits)
How organizations can successfully collect, evaluate and apply information for better decision making. Emerging technologies such as transaction processing systems, RFID, weblogs, social networks, website usage, and online communities have the potential to reveal market trends, suppliers’ preferences, and competitors’ next moves. The success of an organization largely depends on its ability to take advantage of those data sets that are already available to it. The class starts with basic IT strategy concepts for the identification of the opportunities for BI solutions, and ends with hands-on experience using Business Intelligence tools to implement such solutions.
**Equivalent to:** BA 483

BA 482. INFORMATION SECURITY GOVERNANCE. (4 Credits)
As a discipline cybersecurity covers software, hardware, networking, systems, individuals, organizations and applicable policies, laws and standards, among others. Given societies’ dependence on the security of global infrastructure and the increasing complexity of maintaining the security of those systems, there is a growing need for an interdisciplinary approach to study this topic. This course introduces several well-regarded and well-used IT and IT security governance frameworks which can be used to apply and govern security policies and protocols in organizations. The course also delves into SOC IT auditing.

BA 483. BUSINESS ANALYTICS. (4 Credits)
Presents how organizations can successfully ‘collect, evaluate and apply information’ for better decision making. Technologies such as transaction processing systems, RFID, weblogs, social networks, website usage, and online communities have the potential to reveal market trends, suppliers’ preferences, and competitors’ next moves. The success of an organization largely depends on its ability to take advantage of those data sets that are already available to it.
**Prerequisites:** BA 371 with C- or better and BA 479 [C-]
**Equivalent to:** BA 481

BA 487. HOSPITALITY FINANCIAL MANAGEMENT. (4 Credits)
Introduces students to the evaluation of investments in competitive products and services as sustainable strategies for the hospitality industry.
**Prerequisites:** BA 360 with C- or better and BA 486 [C-]

BA 488. ADVANCED HOSPITALITY MANAGEMENT. (4 Credits)
Designed to provide students with an in-depth understanding of the importance of core competencies in the hospitality industry in terms of overall value addition, competitive methods, and competitive advantage, taking into consideration both present and future effects.
**Prerequisites:** BA 352 with C- or better

BA 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

BA 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

BA 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

BA 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

BA 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

BA 510. BUSINESS INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conferences, reports, and appraisals.
**This course is repeatable for 16 credits.**
BA 512. BUSINESS ANALYSIS AND COMMUNICATION. (6 Credits)
Students will be guided through a process of determining business issues or challenges given specific situations, providing reasons/justifications why these are important, proposing solutions to the identified business problems, and communicating this analysis through in-class discussions and writing.
Recommended: ALS 162 with a minimum grade of B

BA 513. BUSINESS LEGAL ENVIRONMENT. (3 Credits)
Provides the essential legal foundation for business managers in companies operating in the U.S. Effective strategies for managers to prevent and resolve legal disputes will be stressed. Topics include legal issues related to corporate forms, creating and enforcing contracts, reducing exposure to tort liability and the role of employees as agents of a business.

BA 514. OPERATIONS MANAGEMENT. (3 Credits)
Provides a foundation for business managers in statistics and operations management. Emphasis on quantitative tools for sampling, interval estimation and hypothesis testing as well as operations management concepts for processes, quality systems, supply chain management, inventory management, resource planning, and sustainable lean systems.
Recommended: College algebra (including probabilities).

BA 515. MANAGERIAL DECISION TOOLS. (3 Credits)
Develop business management skills by learning the principles of managerial and financial accounting. Emphasis will be placed on understanding financial statements, cost analysis, and funding decisions. Focuses on integrating the theoretical framework of accounting and finance with the "hands on" technical skills needed to evaluate financial decisions within an organization.
Recommended: College algebra.

BA 516. CREATING VALUE IN EXCHANGE. (3 Credits)
A graduate-level survey course that provides a foundation for business managers in the concepts of marketing. The student will develop an understanding of marketing principles and an awareness of marketing challenges.
Recommended: Microeconomics

BA 517. MARKETS AND VALUATION. (3 Credits)
Introduces students to the basic questions facing a financial manager and the tools a financial manager uses to find answers to these questions. Introduces the basic tools of finance and applications of financial theory in use today. Students will be introduced to legal, ethical, technology, and global issues facing a financial manager. The course is designed to enhance a student's approach to financial decision making and emphasizes technical analysis and quantitative approaches to decision making.

BA 518. ADOPTING THE ENTREPRENEURIAL MINDSET. (3 Credits)
Introduces the fundamentals of entrepreneurship and innovation, and exposes the concepts, practice, and tools of the entrepreneurial world.

BA 528. FINANCIAL AND COST ANALYSIS. (3 Credits)
Analysis of the balance sheet and income statement to determine profitability, risk, and rate of return; preparation of pro forma financial statements; cost measurement for products, projects, jobs, customers, and markets; strategic cost decision making for pricing and resource allocation.
Recommended: BA 213 with a grade of C- or higher

BA 531. BUSINESS LAW - TECHNOLOGY/NEW VENTURES. (3 Credits)
An integrative course on managing legal and ethical issues for new ventures. Focuses on business law for founders of start-up companies including formation of new business entities, protecting intellectual property, workforce management and global issues. Topics presented from an entrepreneurial perspective and include technology law, e-commerce law and government regulation. Students develop skills to identify and resolve legal and ethical issues, deal with administrative agencies, and proactively manage legal liability. Considerations of ethics and corporate responsibility are emphasized.
Recommended: BA 230 or BA 330 or BA 513 with a minimum grade of B-

BA 532. ENVIRONMENTAL LAW, SUSTAINABILITY, AND BUSINESS. (4 Credits)
Explores fundamental business, legal, and policy issues raised by environmental law, sustainable business practices, and clean energy policies, and their impact on business and management practices.

BA 533. BUSINESS LAW FOR MANAGERS. (3 Credits)
Develops knowledge and skills about business law used by managers in global organizations. Topics covered include establishing lawful and ethical business practices; preventing and responding to compliance failures, infringement and other legal threats; effective use of contracts; and resolving disputes through litigation and alternative dispute resolution.
Recommended: BA 230 and BA 233 and BA 513 and PHAR 707 and PHAR 708

BA 540. CORPORATE FINANCE. (3 Credits)
Emphasizes analytical tools to measure and manage firm value, through corporate strategies such as mergers and acquisitions, leveraged buyouts, international expansion, and new venture development.
Recommended: (BA 340 or FIN 340 or FIN 340H) with a minimum grade of C-

BA 543. FINANCIAL MARKETS AND INSTITUTIONS. (3 Credits)
Investigates the five major financial markets: common stock, bond, derivatives, mortgage, and currency. The course examines the agents in each of these markets, the rules of trading, and the rationale of the agents participating in the different markets.
Recommended: (BA 340 or FIN 340 or FIN 340H) with a minimum grade of C-

BA 550. ORGANIZATION LEADERSHIP AND MANAGEMENT. (3 Credits)
Organization-wide implementation issues driven by change. Provides a balanced view of the structural and human sides of organization design.
Recommended: BA 352 with a minimum grade of C-

BA 551. SUPPLY AND SOURCING MANAGEMENT. (3 Credits)
Focus on effectively using operations and supply chain management to make sourcing and supply decisions in international business contexts. Topics include purchasing/procurement procedures and policy, supply organization, specifications, sourcing strategy, supplier evaluation, competitive bidding, and e-procurement. Global contexts and environmentally and socially responsible supply management are emphasized.

BA 552. MANUFACTURING AND SERVICE OPERATIONS. (3 Credits)
Focus on the management of global service operations including designing and managing systems to coordinate global information and material flows within and between firms in a supply chain. Covers planning operations, evaluating system alternatives, designing and researching global supply networks, examining complex adaptive systems and evaluating value stream synchronization.
Prerequisites: BA 551 with B- or better and BA 555 [B-]
Equivalent to: BA 559
BA 554. LEAN ENTERPRISE MANAGEMENT AND CAPSTONE. (3 Credits)
Analyze business cases that address global value creation and production/delivery systems. Complete integrated business projects to identify critical operations and supply chain management issues, apply multidisciplinary knowledge, analyze and evaluate alternative solutions and write and present reports recommending firm strategies. International business and cross-cultural competencies are emphasized.
Prerequisites: BA 559 with B- or better and BA 561 [B-]

BA 555. PRACTICAL BUSINESS ANALYSIS. (3 Credits)
Advanced survey of quantitative business methods useful for aiding management decisions. Topics include a review of basic statistics, mathematical programming, business simulation, statistical process control, advanced regression analysis and forecasting.
Recommended: BA 275 with a minimum grade of C- or higher

BA 557. GLOBAL LOGISTICS MANAGEMENT: FUNDAMENTALS AND STRATEGY. (3 Credits)
Students will learn key concepts, basic strategies, and decision-making tools relevant to logistics management, and apply them to real-world logistics problems faced by companies in the context of managing their global supply chains.
Prerequisites: BA 551 with B or better and BA 552 [B] and BA 561 [B]

BA 559. SERVICE OPERATIONS MANAGEMENT. (3 Credits)
Focus on the management of global service operations including designing and managing systems to coordinate global information and material flows within and between firms in a supply chain. Covers planning operations, evaluating system alternatives, designing and researching global supply networks, examining complex adaptive systems and evaluating value stream synchronization.
Prerequisites: BA 551 with B- or better and BA 555 [B-]
Equivalent to: BA 552

BA 560. VENTURE PLANNING. (3 Credits)
Entrepreneurial and innovation processes applied to new business start-ups, existing small businesses, and new ventures within larger organizations; emphasis on venture planning with project management.
Recommended: (BA 340 or BA 340H or FIN 340 or FIN 340H) and (BA 390 or BA 390H) with a minimum grade of C-

BA 561. SUPPLY CHAIN MANAGEMENT. (3 Credits)
Covers tools and concepts needed to manage the entire supply chain effectively. Topics include negotiation, purchasing, logistics operations, and applying e-business tools. Emphasis on creating integrated supply chains.
Recommended: (BA 357 and BA 555) with a minimum grade of C-

BA 562. MANAGING PROJECTS. (3 Credits)
Covers tools and concepts used by managers to plan and initiate business projects. Computer applications, cases and a project.
Recommended: (BA 352 and BA 357) with a minimum grade of C-

BA 563. FAMILY ENTERPRISE GOVERNANCE. (4 Credits)
Builds on the introductory family business management course to examine the required elements of a successful enterprise, a diversified and multigenerational organization comprised of multiple business lines.
Recommended: BA 365

BA 567. SELECTED TOPICS IN MANAGEMENT. (0-4 Credits)
Examination of the impact of recent advances in management on contemporary business. Topic will vary from term to term. Lec/rec.
This course is repeatable for 16 credits.

BA 568. INTEGRATED BUSINESS PROJECT. (3 Credits)
The project requires students to complete a business plan, as a means of directing the development of a business. A business plan can help focus a business idea, chart a course for strategic business development, and facilitate setting objectives and creating evaluative benchmarks of progress. To be taken during the last year of the MBA program.

BA 569. ADVANCED STRATEGIC MANAGEMENT. (3 Credits)
Advanced integrative case-based course on the process of systematically developing and managing firm strategies. Topics are covered from a general management perspective and include setting corporate goals and objectives, analyzing external competitive environments, understanding business models, identifying strategy options, and designing appropriate organization systems and structure for implementation of plans. International and e-business issues are integrated throughout.
Recommended: All foundation courses

BA 570. INNOVATION STRATEGY, IP, AND NPD. (3 Credits)
Enables students who are aspiring entrepreneurs forming new ventures or corporate managers leading existing businesses to understand the fundamental drivers of the success or failure of new products, from the perspective of the strategic management of technological innovation.
Prerequisites: BA 560 with B- or better

BA 571. HEALTHCARE AND BIOMEDICAL INNOVATION. (3 Credits)
An integrative learning experience intended to provide current and future managerial, analytical, clinical, and technical professionals in health-related fields with an understanding of the full range of strategic issues associated with innovation management, intellectual property (IP) protection, and new product development. Through the use of conceptual frameworks, relevant case studies, simulations, and product/service examples drawn from the global healthcare ecosystem, explore the effective use of IP to reduce and manage risk, facilitate market entry, and enhance competitive positioning.

BA 572. ADVANCED INFORMATION SYSTEMS. (3 Credits)
The development, implementation and management of information technology applications will be addressed. Topics will address the development and application of technology to support linkages within the organization and outside the organization. Projects will be assigned to illustrate the topics.

BA 573. DATA ANALYTICS FOR COMPETITIVE ADVANTAGE. (3 Credits)
Case studies, hands-on data analysis experience, and a class project will introduce basic concepts of data analytics, sketch the lifecycle of a data analytics project, and connect analytics to business consequences. Students will use representative analytic tools to support decision making.

BA 574. DATA MANAGEMENT. (3 Credits)
Familiarize students with the major activities involved in collecting and managing data for a data analytics project, including extracting information from relational databases, mapping organizational requirements into a data design, transforming data into information, exploring data warehouse concepts, and exploring basic concepts underlying Hadoop and other noSQL data management and analysis methods.
Prerequisites: BA 573 with C or better
BA 575. DATA EXPLORATION AND VISUALIZATION. (3 Credits)
In this course we concentrate on the initial, exploratory phases of business analytic data analysis. We explore different types of data and the types of analysis they allow; aggregating and disaggregating data and issues of validity with both selecting and collecting data. We also start exploring one or more datasets relating to our Integrated Business Analytics Project (BA 577).
Prerequisites: BA 573 with C or better

BA 576. DATA AND TEXT MINING. (3 Credits)
Examine how data/text analysis technologies can be used to improve decision making. The class covers the fundamental principles and techniques of data mining, text analysis, and uses real-world examples and cases to place data-mining techniques in context. Students will have hands-on experience with data/text mining software.
Prerequisites: BA 574 with C or better and BA 575 [C]

BA 577. INTEGRATED BUSINESS ANALYTICS PROJECT. (3 Credits)
Students will integrate what they have learned to solve industry-sponsored problems. The goal of the class is to provide students with opportunities to design, implement, and evaluate analytic solutions for a real-world enterprise. Student teams will examine the data requirements, technical requirements, and organizational requirements necessary for the success of analytical solutions. The project will give students the experience of leading and managing an analytical team, much as a Chief Analytics Officer (CAO) would be expected to do.
Prerequisites: BA 555 with C or better and BA 574 [C] and BA 575 [C]

BA 578. SUPPLY CHAIN ANALYTICS. (3 Credits)
Explores modeling methods for design, analysis, execution and integration of supply chains. Introduces students to a variety of modeling and optimization techniques for the analysis of strategic, tactical and operational supply chain problems including demand forecasting, risk analysis, revenue management, distribution and facility location.
Prerequisites: BA 555 with B- or better

BA 590. MARKETING MANAGEMENT. (3 Credits)
Provides students with an understanding of how a market-orientation can help firms to profitably deliver value to their targeted customers. Through a combination of lectures, in-class exercises, and case discussions, students will learn how to analyze complex marketing challenges, and make strategic decisions based on established marketing management principles.
Recommended: BA 390 with a minimum grade of C-

BA 599. SPECIAL TOPICS IN BUSINESS ADMINISTRATION. (1-4 Credits)
This course is repeatable for 16 credits.

BA 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 32 credits.

BA 602. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 32 credits.

BA 603. THESIS/DISSERTATION. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

BA 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 32 credits.

BA 607. SEMINAR. (1-16 Credits)
This course is repeatable for 32 credits.

BA 611. TEACHING EFFECTIVENESS. (1-6 Credits)
Provides an overview of a broad range of effective teaching techniques and common issues associated with teaching at the college level (e.g., defining learning outcomes, common pitfalls, assessing of student learning, etc.).
This course is repeatable for 6 credits.

BA 612. FOUNDATIONS OF BUSINESS RESEARCH. (3 Credits)
Introduces first-year business doctoral students to concepts fundamental to conducting research in business as a social science. Specific topics may change from quarter to quarter, but sample topics include the academic environment in business, research paradigms, ethics in research, fundamentals of scientific research, constructs, validity, sampling, and analysis and interpretation.

BA 613. SEMINAR IN BUSINESS RESEARCH METHODS. (3 Credits)
Provides first-year business PhD students with an in-depth introduction to the most common research methodologies used by current business faculty across multiple functional disciplines. Specific research methods covered may change from quarter to quarter, but sample topics include use of basic econometric models for analysis of archival data, experimental methodologies, qualitative research techniques, and survey research.

BA 660. FOUNDATIONS OF ENTREPRENEURSHIP RESEARCH. (3 Credits)
Provides a broad overview of the foundations of entrepreneurship research, including theoretical underpinnings of the field as well as some of the common and/or promising approaches to the study of entrepreneurial phenomena.

BA 661. DOCTORAL SEMINAR IN ORGANIZATIONAL THEORY. (3 Credits)
Surveys research on classic and contemporary developments in basic organizational theory.

BA 662. CORPORATE ENTREPRENEURSHIP AND NEW VENTURES. (3 Credits)
Surveys research in the area of corporate entrepreneurship and venturing, focusing on relevant theoretical underpinnings and core concepts in the corporate entrepreneurship, entrepreneurship, and strategy literatures.

BA 663. STRATEGIC MANAGEMENT. (3 Credits)
Surveys research exploring the central question in strategy: Why do some firms outperform others? The course considers a wide variety of foundational and contemporary issues in the field, and while specific topics may change from quarter to quarter, sample topics include competitive and cooperative interactions, the resource-based view and firm capabilities, organizational learning and adaptation, and industry evolution.

BA 664. TECHNOLOGY AND INNOVATION MANAGEMENT. (3 Credits)
Surveys research on the management of innovation and technology in organizations, focusing on innovation as an outcome (product, service, technology, practice) and on the process of generation, adoption, and implementation of innovation in organizations.

BA 808. WORKSHOPS. (0-16 Credits)
Workshops aimed at practicing professionals in the discipline. Topics may vary.
Chem, Bio, Enviro Engineering (CBEE)

CBEE 101. CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION. (3 Credits)
Introduction to the engineering profession in general and in particular the CHE, BIOE, and ENVE programs; development of problem solving strategies and teamwork; analysis and presentation of experimental data, basic process calculations, and design methodologies.
Equivalent to: BIOE 101, CBEE 101H, CHE 101, ENVE 101

CBEE 101H. CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGR ORIENTATION. (3 Credits)
Introduction to the engineering profession in general and in particular the CHE, BIOE, and ENVE programs; development of problem solving strategies and teamwork; analysis and presentation of experimental data, basic process calculations, and design methodologies.
Attributes: HNRS – Honors Course Designator
Equivalent to: CBEE 101

CBEE 102. ENGINEERING PROBLEM SOLVING AND COMPUTATIONS. (3 Credits)
Elementary programming and problem-solving concepts implemented using MATLAB software; emphasis on problem analysis and development of algorithms in engineering including dimensional analysis; application experiences are established through team-based activities including projects using the LEGO-NXT microprocessor for data acquisition.
Prerequisites: MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better
Equivalent to: BIOE 102, CBEE 102H, CHE 102, ENVE 102

CBEE 102H. ENGINEERING PROBLEM SOLVING AND COMPUTATIONS. (3 Credits)
Elementary programming and problem-solving concepts implemented using MATLAB software; emphasis on problem analysis and development of algorithms in engineering including dimensional analysis; application experiences are established through team-based activities including projects using the LEGO-NXT microprocessor for data acquisition.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better
Equivalent to: CBEE 102

CBEE 111. ENGINEERING PROBLEM SOLVING FUNDAMENTALS. (3 Credits)
Engineering problem solving, dimensional analysis, sketches and drawings, algorithmic thinking, arrays and indexing, understanding the operating system and file handling, the concepts of programming languages and syntax, troubleshooting approaches to coding. Lec/Studio.
This course is repeatable for 3 credits.

CBEE 211. MATERIAL BALANCES AND STOICHIOMETRY. (3 Credits)
Material balances, thermophysical, and thermochemical calculations.
Lec/rec.
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: BIOE 211, CBEE 211H, CHE 211, ENVE 211
Recommended: General chemistry and second-year standing in engineering

CBEE 211H. MATERIAL BALANCES AND STOICHIOMETRY. (3 Credits)
Material balances, thermophysical, and thermochemical calculations.
Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: CBEE 211
Recommended: General chemistry and second-year standing in engineering

CBEE 212. ENERGY BALANCES. (3 Credits)
Energy balances, thermophysical and thermochemical calculations. Lec/rec.
Prerequisites: (CBEE 211 with C or better or CBEE 211H with C or better) and (MTH 256 (may be taken concurrently) [C] or MTH 256H (may be taken concurrently) [C])
Equivalent to: BIOE 212, CBEE 212H, CHE 212, ENVE 212
Recommended: One year general chemistry and second-year standing in engineering

CBEE 212H. ENERGY BALANCES. (3 Credits)
Energy balances, thermophysical and thermochemical calculations. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (CBEE 211 with C or better or CBEE 211H with C or better) and (MTH 256 (may be taken concurrently) [C] or MTH 256H (may be taken concurrently) [C])
Equivalent to: CBEE 212
Recommended: One year general chemistry and second-year standing in engineering

CBEE 213. PROCESS DATA ANALYSIS. (4 Credits)
Applications of material and energy balances, with an emphasis on data analysis important to chemical engineers, bioengineers, and environmental engineers. Contextual learning is emphasized through the laboratory component and the use of process flow simulation modeling and analysis software.
Prerequisites: CBEE 212 (may be taken concurrently) with C or better or CBEE 212H (may be taken concurrently) with C or better
Equivalent to: BIOE 213, CHE 213, ENVE 213

CBEE 280. MATERIAL AND ENERGY BALANCES. (0-6 Credits)
Material balances, thermophysical, and thermochemical calculations.
Energy balances, thermophysical and thermochemical calculations.
Prerequisites: MTH 256 (may be taken concurrently) with C or better or MTH 256H (may be taken concurrently) with C or better
This course is repeatable for 6 credits.

CBEE 320. PROFESSIONALISM AND ENGINEERING ETHICS. (3 Credits)
Introduction to engineering ethics. Topics include ethical theory, professional engineering responsibility, codes of ethics, ethical assessment, conflicts of interest, risk and safety, loyalty and dissent, as well as overarching professional concerns.
Prerequisites: CBEE 212 with C or better or CBEE 212H with C or better or CBEE 280 with C or better
Equivalent to: BIOE 320

CBEE 414. *PROCESS ENGINEERING LABORATORY. (3 Credits)
Unit operations and unit processes; preparation of technical reports. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CBEE 213 (may be taken concurrently) with C or better and CHE 311 [C] and (CHE 333 [C] or CHE 333H [C])
Equivalent to: BIOE 414, CBEE 414H, CHE 414, CHE 414H, ENVE 414
CBEE 414H. *PROCESS ENGINEERING LABORATORY. (3 Credits)
Unit operations and unit processes; preparation of technical reports. Lec/ lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: CBEE 213 (may be taken concurrently) with C or better and CHE 311 [C] and (CHE 333 [C] or CHE 333H [C])
Equivalent to: CBEE 414

CBEE 416. CBEE LABORATORY II. (3 Credits)
Integration of overall knowledge of chemical, biological, and environmental engineering through group project activities culminating with public demonstration or display of project results.
Prerequisites: CHE 415 with C or better or CHE 415H with C or better or BIOE 415 with C or better or ENVE 415 with C or better
Equivalent to: CHE 416

CBEE 507. SEMINAR. (1 Credit)
Graded P/N.
This course is repeatable for 6 credits.

Chemical Engineering (CHE)

CHE 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: CHE 199H
This course is repeatable for 99 credits.

CHE 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CHE 199

CHE 299. PROFESSIONAL WORKSKILLS. (1-16 Credits)
Equivalent to: CHE 299H
This course is repeatable for 99 credits.

CHE 311. THERMODYNAMICS. (3 Credits)
Enteropy, the second law of thermodynamics, equations of state, and thermodynamic network.
Prerequisites: (CBEE 212 with C or better or CBEE 212H with C or better or CBEE 280 with C or better) and (MTH 256 [C] or MTH 256H [C])

CHE 312. CHEMICAL ENGINEERING THERMODYNAMICS. (3 Credits)
Thermodynamic mixtures, fugacity, phase equilibrium, and chemical reactions equilibrium.
Prerequisites: CHE 311 with C or better

CHE 320. SAFETY, ENGINEERING ETHICS AND PROFESSIONALISM. (3 Credits)
Introduction to engineering ethics and safety concepts. Topics include professional engineering responsibility, codes of ethics, ethical assessment, conflicts of interest, loyalty and dissent, life-long learning, hazard identification, risk and safety, and process safety management. Lec/rec.
Prerequisites: CBEE 212 with C or better or CBEE 212H with C or better or CBEE 280 with C or better

CHE 331. TRANSPORT PHENOMENA I. (4 Credits)
Fundamentals and application of momentum and energy transfer phenomena to fluid flow for the design of industrial chemical engineering equipment.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (CBEE 212 [may be taken concurrently] [C] or CBEE 212H [may be taken concurrently] [C])
Equivalent to: CHE 323, CHE 331H

CHE 331H. TRANSPORT PHENOMENA I. (4 Credits)
Fundamentals and application of momentum and energy transfer phenomena to fluid flow for the design of industrial chemical engineering equipment.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (CBEE 212 [may be taken concurrently] [C] or CBEE 212H [may be taken concurrently] [C])
Equivalent to: CHE 331

CHE 332. TRANSPORT PHENOMENA II. (3 Credits)
A unified treatment using control volume and differential analysis of heat transfer, prediction of heat transport properties, and introduction to heat transfer operations.
Prerequisites: CHE 311 with C or better and (CHE 331 [C] or CHE 331H [C])
Equivalent to: CHE 332H

CHE 332H. TRANSPORT PHENOMENA II. (3 Credits)
A unified treatment using control volume and differential analysis of heat transfer, prediction of heat transport properties, and introduction to heat transfer operations.
Attributes: HNRS – Honors Course Designator
Prerequisites: CHE 311 with C or better and (CHE 331 [C] or CHE 331H [C])
Equivalent to: CHE 332

CHE 333. TRANSPORT PHENOMENA III. (3 Credits)
A unified treatment using control volume and differential analysis of binary mass transfer, prediction of mass transport properties, and introduction to mass transfer operations. Lec/studio.
Prerequisites: CHE 331 with C or better or CHE 331H with C or better or CHE 332 with C or better or CHE 332H with C or better
Equivalent to: CHE 333H

CHE 333H. TRANSPORT PHENOMENA III. (3 Credits)
A unified treatment using control volume and differential analysis of binary mass transfer, prediction of mass transport properties, and introduction to mass transfer operations. Lec/studio.
Attributes: HNRS – Honors Course Designator
Prerequisites: CHE 331 with C or better or CHE 331H with C or better or CHE 332 with C or better or CHE 332H with C or better
Equivalent to: CHE 333

CHE 334. TRANSPORT PHENOMENA LABORATORY. (3 Credits)
Engineering lab practices and the application of the macroscopic balances of mass, energy, and chemical species; fluid flow, heat and mass transfer experiments by teams for demonstrations of principles established in previous transport phenomena courses.
Prerequisites: CBEE 213 (may be taken concurrently) with C or better and (CHE 333 [may be taken concurrently] [C] or CHE 333H [may be taken concurrently] [C])

CHE 361. CHEMICAL PROCESS DYNAMICS AND SIMULATION. (3 Credits)
Fundamental principles for process dynamic modeling used in the control of process variables such as pressure, temperature, flow rate and chemical composition.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (CHE 331 [C] or CHE 331H [C])
Recommended: CBEE 102 and completion of concurrent enrollment in (CHE 331 or CHE 331H)

CHE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CHE 401. RESEARCH. (1-16 Credits)
Equivalent to: CHE 401H
This course is repeatable for 16 credits.
CHE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CHE 405H
This course is repeatable for 16 credits.

CHE 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CHE 405
This course is repeatable for 16 credits.

CHE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 411. MASS TRANSFER OPERATIONS. (4 Credits)
Mass transfer operations; design of separation processes. Lec/rec.
Prerequisites: CHE 312 with C or better and (CHE 333 [C] or CHE 333H [C])

CHE 415. CHEMICAL ENGINEERING LABORATORY I. (3 Credits)
Theoretical and empirical analysis of several unit operations, use of formal work processes, safety, teamwork, oral and written communication, and personal accountability. Lec/lab/rec.
Prerequisites: CBEE 414 with C or better and CHE 411 [C] and CHE 443 [C] and CHE 361 (may be taken concurrently) [C]
Equivalent to: CHE 415H, ENVE 415

CHE 417. INSTRUMENTATION IN CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGINEERING. (4 Credits)
Equips students with a toolbox of instrumental techniques important in chemical, biological, and environmental engineering and the background required to determine the appropriate instrumental technique to address a specific problem. Lec/lab/rec.
Prerequisites: CH 332 with C or better or CH 335 with C or better
Recommended: (CH 231 or CH 231H) and (CH 261 or CH 261H) and (CH 232 or CH 232H) and (CH 262 or CH 262H) and (CH 233 or CH 233H) and (CH 263 or CH 263H)

CHE 431. CHEMICAL PLANT DESIGN I. (3 Credits)
Short-cut techniques and other abbreviated and useful methods for specifying equipment sufficient for the preliminary design of processes and equipment; estimating capital and manufacturing costs based on equipment specifications.
Prerequisites: CHE 312 with C or better and CHE 411 [C] and CHE 443 [C]

CHE 432. CHEMICAL PLANT DESIGN II. (3 Credits)
Transformation of preliminary design to detailed design; introduction to safety, ethical, economical, and environmental considerations in chemical plant design.
Prerequisites: CHE 431 with C or better

CHE 443. CHEMICAL REACTION ENGINEERING. (4 Credits)
Design of chemical reactors for economical processes and waste minimization. Contacting patterns, kinetics and transport rate effects in single phase and catalytic systems.
Prerequisites: CHE 312 with C or better and (CHE 333 [C] or CHE 333H [C])

CHE 444. THIN FILM MATERIALS PROCESSING. (4 Credits)
Solid state devices are based on the patterning of thin films. This lecture and lab course is primarily an introduction to the technology associated with processing thin films. Topics include chemical vapor deposition, physical vapor deposition, plasma etching, and thin-film characterization. Lec/lab/rec.
Prerequisites: CHE 443 (may be taken concurrently) with C or better
Recommended: CHE 443

CHE 445. POLYMER ENGINEERING AND SCIENCE. (4 Credits)
Polymer engineering and science with an emphasis on practical applications and recent developments. Topics include polymer synthesis, characterization, mechanical properties, rheology, and processing at a level suitable for most engineering and science majors. Lec/lab/rec.
Recommended: CH 334 and CH 335 and CH 336 and (MTH 256 or MTH 256H) and/or junior standing in engineering or science

CHE 450. CONVENTIONAL AND ALTERNATIVE ENERGY SYSTEMS. (3 Credits)
Principles of energy conversion from chemical/mechanical energy to electrical energy including an overview of conventional energy systems and of likely renewable energy systems with a focus on the fundamental physico-chemical and thermodynamic concept for each technology. The economics of energy systems will also be discussed.
Prerequisites: CHE 311 (may be taken concurrently) with C or better or ME 311 (may be taken concurrently) with C or better or ME 311H (may be taken concurrently) with C or better or CH 440 (may be taken concurrently) with C or better

CHE 451. SOLAR ENERGY TECHNOLOGIES. (3 Credits)
A foundation in the principles of solar energy processes is provided. Topics covered include photovoltaics and solar thermal, and will cover the fundamental solid state physics of semiconductors to applied heat transfer analysis of solar collectors. The course objective is to equip students with an adequate depth of understanding of the operational principles of solar energy systems, and to cover the breadth of the various approaches employed in active solar energy systems.
Prerequisites: CHE 311 (may be taken concurrently) with C or better or ME 311 (may be taken concurrently) with C or better or ME 311H (may be taken concurrently) with C or better or CH 440 (may be taken concurrently) with C or better
Recommended: CHE 311

CHE 452. ELECTROCHEMICAL ENERGY SYSTEMS. (3 Credits)
Introduces principles and processes of electrochemical energy storage and conversion systems. Topics include fundamentals of electrochemistry and concepts of electrochemical energy storage systems. Examples from batteries, fuel cells, supercapacitors devices will be discussed. Lec/rec.
Prerequisites: CHE 311 with C or better and (CHE 333 [C] or CHE 333H [C])

CHE 461. PROCESS CONTROL. (3 Credits)
Principles of PID feedback control based on models of chemical processes; analysis and implementation of proportional, integral and derivative tuning; cascade, feedforward, ratio and deadtime compensation; multivariable control and control system design issues and methods.
Prerequisites: (CHE 331 with C or better or CHE 331H with C or better) and (CHE 332 (may be taken concurrently) [C] or CHE 332H (may be taken concurrently) [C]) and CHE 361 [C]

CHE 499. SPECIAL TOPICS. (0-4 Credits)
This course is repeatable for 8 credits.

CHE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
CHE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CHE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 514. FLUID FLOW. (4 Credits)
Fundamentals of fluid dynamics for Newtonian and non-Newtonian fluids; flow through porous media; two-phase flow. Lec/rec.

CHE 517. INSTRUMENTATION IN CHEMICAL, BIOLOGICAL, AND ENVIRONMENTAL ENGINEERING. (4 Credits)
Equips students with a toolbox of instrumental techniques important in chemical, biological, and environmental engineering and the background required to determine the appropriate instrumental technique to address a specific problem. Lec/lab/rec.

Recommended: (CHE 321 and CH 261 and CH 232 and CH 262 and CH 233 and CH 263)

CHE 520. MASS TRANSFER I. (4 Credits)

CHE 525. CHEMICAL ENGINEERING ANALYSIS. (4 Credits)
Modeling of physical and chemical processes; mathematical analysis of models with appropriate advanced techniques.

CHE 537. CHEMICAL ENGINEERING THERMODYNAMICS I. (4 Credits)
Applications of the fundamental laws of thermodynamics to complex systems. Properties of solutions of non-electrolytes. Phase and chemical equilibrium.

CHE 540. CHEMICAL REACTORS I. (4 Credits)
Catalysis, reactions coupled with transport phenomena. Reactors for high tech applications.

CHE 541. CATALYSIS. (3 Credits)
Introduction to topics related to catalysts and catalytic reactions. Course covers catalytic reaction mechanisms and kinetics, catalyst characterization and testing, and catalyst preparation and manufacturing processes.

CHE 542. MOLECULAR ASPECTS OF HETEROGENEOUS CATALYSIS. (3 Credits)
Introducing the principles of heterogeneous catalysis from the molecular aspect with emphasis on computational molecular approaches and surface science. The role of surface structure in heterogeneous catalytic reactions and surface interactions, development and analysis of reaction kinetics through microkinetic modeling approaches will be covered. A class project will utilize Density Functional Theory software to calculate catalytic properties of model systems.

Prerequisites: CHE 540 with C or better

CHE 544. THIN FILM MATERIALS PROCESSING. (4 Credits)
Solid state devices are based on the patterning of thin films. This lecture and lab course is primarily an introduction to the technology associated with processing thin films. Topics include chemical vapor deposition, physical vapor deposition, plasma etching, and thin-film characterization. Lec/lab/rec.

Recommended: CHE 443 or CHE 543

CHE 545. POLYMER ENGINEERING AND SCIENCE. (4 Credits)
Polymer engineering and science with an emphasis on practical applications and recent developments. Topics include polymer synthesis, characterization, mechanical properties, rheology, and processing at a level suitable for most engineering and science majors. Lec/lab/rec.

Recommended: CHE 334 and CH 335 and CH 336 and MTH 256

CHE 550. CONVENTIONAL AND ALTERNATIVE ENERGY SYSTEMS. (3 Credits)
Principles of energy conversion from chemical/mechanical energy to electrical energy including an overview of conventional energy systems and of likely renewable energy systems with a focus on the fundamental physico-chemical and thermodynamic concept for each technology. The economics of energy systems will also be discussed.

Recommended: CHE 311 or ME 311 or ME 311H

CHE 551. SOLAR ENERGY TECHNOLOGIES. (3 Credits)
A foundation in the principles of solar energy processes is provided. Topics covered include photovoltaics and solar thermal, and will cover the fundamental solid state physics of semiconductors to applied heat transfer analysis of solar collectors. The course objective is to equip students with an adequate depth of understanding of the operational principles of solar energy systems, and to cover the breadth of the various approaches employed in active solar energy systems.

Recommended: CHE 311

CHE 552. ELECTROCHEMICAL ENERGY SYSTEMS. (3 Credits)
Introduces principles and processes of electrochemical energy storage and conversion systems. Topics include fundamentals of electrochemistry and concepts of electrochemical energy storage systems. Examples from batteries, fuel cells, supercapacitors devices will be discussed. Lec/rec.

Recommended: CHE 311 AND (CHE 333 or CHE 333H)

CHE 581. SELECTED TOPICS. (3 Credits)
Non-sequence course designed to acquaint students with recent advances in chemical engineering. Topics vary from term to term and from year to year. May be repeated for credit.

This course is repeatable for 9 credits.

CHE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CHE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CHE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CHE 611. ELECTRONIC MATERIALS PROCESSING. (3 Credits)
Technology, theory, and analysis of processing methods used in integration circuit fabrication. Offered alternate years. CROSSLISTED as CHE 611/ECE 611.

Equivalent to: CHE 571, ECE 611

CHE 612. PROCESS INTEGRATION. (3 Credits)
Process integration, simulation, and statistical quality control issues related to integrated circuit fabrication. Offered alternate years. CROSSLISTED as CHE 612/ECE 612.

Equivalent to: CHE 572, ECE 612

Recommended: CHE 611 or ECE 611
CHE 613. ELECTRONIC MATERIALS AND CHARACTERIZATION. (3 Credits)
Physics and chemistry of electronic materials and methods of materials characterization. Offered alternate years. CROSSLISTED as CHE 613/ ECE 613.
Equivalent to: CHE 573, ECE 613

Chemistry (CH)

CH 101. CHEMISTRY IN YOUR WORLD. (3 Credits)
For students who need some additional preparation before enrolling in a general chemistry course. Explores the impact of chemistry on our everyday lives while acquiring the skills it takes to be successful in general chemistry.
Prerequisites: Math Placement - ALEKS with a score of 046 or MTH 095 (may be taken concurrently) with C- or better or MTH 103 (may be taken concurrently) with C- or better or MTH 111 with C- or better or MTH 241 with C- or better or MTH 251 with C- or better or MTH 251H with C- or better or MTH 252 with C- or better or MTH 252H with C- or better

CH 110. ROYGBIV. THE CHEMISTRY OF COLORS. (4 Credits)
An introduction to the concepts of chemistry and the importance of these concepts in understanding color. Lec/lab.
Attributes: CPPS – Core, Pers, Physical Science

CH 121. GENERAL CHEMISTRY. (5 Credits)
A general chemistry sequence for students who have had no previous training in chemistry and for those whose college aptitude test scores indicate the need for a more elementary introduction to chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. Lec/lab/rec. (CH 122, CH 123 are Bacc Core Courses)
Equivalent to: CH 104

CH 122. *GENERAL CHEMISTRY. (5 Credits)
A general chemistry sequence intended for majors in fields other than the physical sciences. Lec/lab/rec. (CH 122 and CH 123 are Bacc Core courses.)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 121 with C- or better or (CH 201 with C- or better or (CH 231 with C- or better or CH 231H with C- or better))

CH 123. *GENERAL CHEMISTRY. (5 Credits)
A general chemistry sequence intended for majors in fields other than the physical sciences. (CH 122 and CH 123 are Bacc Core courses.) Lec/rec/lab.
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 122 with C- or better or (( (CH 232 with C- or better or CH 232H with C- or better) and (CH 262 [C-] or CH 262H [C-] or CH 272 [C-]) or (CH 202 [C-] and CH 205 [C-]))

CH 124. GENERAL CHEMISTRY. (3 Credits)
A bridge course, allowing students who have taken one term of General Chemistry (CH 121) to complete the equivalent of one full semester of general chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. Lec/lab.
Prerequisites: CH 121 with D- or better

CH 125. GENERAL CHEMISTRY. (2 Credits)
A bridge course, allowing students who also take one term of General Chemistry (CH 123) to complete the equivalent of one full semester of General Chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. Lec/lab. Offered via Ecampus only.
Prerequisites: CH 121 with D- or better and CH 124 [D-]
Recommended: One semester of general chemistry at another institution

CH 130. GENERAL CHEMISTRY OF LIVING SYSTEMS. (4 Credits)
Introduction to organic chemistry and the chemistry of biological systems. Organic nomenclature and fundamental reactions, emphasizing topics such as amino acids, proteins, biochemical energy, and nucleic acids (DNA and RNA). Intended as a terminal course in chemistry, not to serve as a prerequisite to higher numbered chemistry courses. Offered via Ecampus only.
Recommended: Entering students should have a working knowledge of high school algebra, logarithms, and scientific notation

CH 199. SPECIAL TOPICS. (1-3 Credits)
This course is repeatable for 3 credits.

CH 201. CHEMISTRY FOR ENGINEERING MAJORS. (3 Credits)
A sequence of selected chemistry topics for pre-engineering students. Lec.
Prerequisites: MTH 111 (may be taken concurrently) with D- or better or MTH 112 (may be taken concurrently) with D- or better or MTH 251 (may be taken concurrently) with D- or better or MTH 251H (may be taken concurrently) with D- or better or MTH 252 (may be taken concurrently) with D- or better or MTH 252H (may be taken concurrently) with D- or better or MTH 254 (may be taken concurrently) with D- or better or MTH 254H (may be taken concurrently) with D- or better or Math Placement - ALEKS with a score of 060

CH 202. CHEMISTRY FOR ENGINEERING MAJORS. (3 Credits)
A sequence of selected chemistry topics for pre-engineering students. Lec.
Prerequisites: CH 121 with C- or better or CH 201 with C- or better or CH 231 with C- or better or CH 231H with C- or better

CH 205. LABORATORY FOR CHEM 202. (1 Credit)
Three-hour weekly session for the development of laboratory skills in general chemistry for engineers. Lec/lab.
Prerequisites: CH 202 (may be taken concurrently) with D- or better

CH 211. RECITATION FOR CHEMISTRY 201. (1 Credit)
80-minute weekly session for the development of problem-solving skills in general chemistry for engineers. Rec.
Corequisites: CH 201

CH 212. RECITATION FOR CHEMISTRY 202. (1 Credit)
One-hour weekly session for the development of problem-solving skills in general chemistry for engineers. Rec.
Corequisites: CH 202
CH 220. CAREERS IN CHEMISTRY. (1 Credit)
Course for chemistry majors that discusses strategies for success in the study of chemistry and the varied career opportunities available. Topics range from surviving freshman chemistry to choices of advanced classes, study abroad opportunities, internships, getting into and succeeding in graduate school, choices of chemical careers in academia, industry, government, non-governmental organizations, and using chemistry as a foundation for careers in other areas such as law and business. Graded P/N.

CH 231. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 231 is a lecture course; CH 261 is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 261)
Attributes: CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: MTH 111 (may be taken concurrently) with C- or better or MTH 112 (may be taken concurrently) with C- or better or MTH 251 (may be taken concurrently) with C- or better or MTH 251H (may be taken concurrently) with C- or better or MTH 252 (may be taken concurrently) with C- or better or MTH 252H (may be taken concurrently) with C- or better or MTH 254H (may be taken concurrently) with C- or better or Math Placement - ALEKS with a score of 060
Equivalent to: CH 221, CH 221H, CH 224H, CH 231H

CH 231H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 231H is a lecture course; CH 261H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 261H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: MTH 111 (may be taken concurrently) with C- or better or MTH 112 (may be taken concurrently) with C- or better or MTH 251 (may be taken concurrently) with C- or better or MTH 251H (may be taken concurrently) with C- or better or MTH 252 (may be taken concurrently) with C- or better or MTH 252H (may be taken concurrently) with C- or better or MTH 254H (may be taken concurrently) with C- or better or Math Placement - ALEKS with a score of 060
Equivalent to: CH 221, CH 221H, CH 224H, CH 231H

CH 232. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 232 is a lecture course; CH 262 is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 262)
Attributes: CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: CH 231 with C- or better or CH 231H with C- or better or CH 221 with C- or better
Equivalent to: CH 232

CH 232H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 232H is a lecture course; CH 262H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 262H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: CH 231 with C- or better or CH 231H with C- or better or CH 221 with C- or better
Equivalent to: CH 232

CH 233. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 233 is a lecture course; CH 263 is the laboratory component. (Bacc Core Course if taken with CH 263)
Attributes: CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: (CH 232 with C- or better or CH 232H with C- or better) or CH 222 with C- or better
Equivalent to: CH 223, CH 226H, CH 233H

CH 233H. GENERAL CHEMISTRY. (4 Credits)
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. CH 233H is a lecture course; CH 263H is the laboratory component. Lec/rec. (Bacc Core Course if taken with CH 263H)
Attributes: CPPL – Core, Pers, PhySci Attached Lec; HNRS – Honors Course Designator
Prerequisites: (CH 232H with C- or better or CH 232H with C- or better) or CH 222 with C- or better
Equivalent to: CH 233

CH 261. *LABORATORY FOR CHEMISTRY 231. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 231)
Attributes: CPPS – Core, Pers, Physical Science
Corequisites: CH 231
Equivalent to: CH 261H, CH 271

CH 261H. *LABORATORY FOR CHEMISTRY 231H. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 231H)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Corequisites: CH 231H
Equivalent to: CH 261

CH 262. *LABORATORY FOR CHEMISTRY 232. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 232)
Attributes: CPPS – Core, Pers, Physical Science
Corequisites: CH 232
Equivalent to: CH 262H, CH 272

CH 262H. *LABORATORY FOR CHEMISTRY 232H. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 232H)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Corequisites: CH 232H
Equivalent to: CH 262
CH 263. *LABORATORY FOR CHEMISTRY 233. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 233)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233
Equivalent to: CH 263H, CH 273
CH 263H. *LABORATORY FOR CHEMISTRY 233H. (1 Credit)
A general chemistry laboratory sequence for students majoring in most sciences, pharmacy, and chemical engineering. (Bacc Core Course if taken with CH 233H)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: CH 262 with D- or better or CH 262H with D- or better or CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233H
Equivalent to: CH 263
CH 271. *LABORATORY FOR CH 231 FOR CHEMISTRY MAJORS. (1 Credit)
A general chemistry laboratory sequence for students majoring in chemistry. (Bacc Core Course if taken with CH 231)
Attributes: CPPS – Core, Pers, Physical Science
Corequisites: CH 231
Equivalent to: CH 271H
CH 272. *LABORATORY FOR CH 232 FOR CHEMISTRY MAJORS. (1 Credit)
A general chemistry laboratory sequence for students majoring in chemistry. (Bacc Core Course if taken with CH 232)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 271 with D- or better or CH 221 with D- or better or CH 224H with D- or better
Corequisites: CH 232
Equivalent to: CH 272H
CH 273. *LABORATORY FOR CH 233 FOR CHEMISTRY MAJORS. (1 Credit)
A general chemistry laboratory sequence for students majoring in chemistry. (Bacc Core Course if taken with CH 233)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: CH 272 with D- or better or CH 222 with D- or better or CH 225H with D- or better
Corequisites: CH 233
Equivalent to: CH 273H
CH 324. QUANTITATIVE ANALYSIS. (4 Credits)
A basic course in modern chemical analysis. Self-paced laboratory. CH 130 does not meet the prerequisites for this course.
Prerequisites: CH 123 with D- or better or CH 223 with D- or better or CH 226H with D- or better or ((CH 233 with D- or better or CH 233H with D- or better) and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-]))
Recommended: One year of general chemistry
CH 331. ORGANIC CHEMISTRY. (4 Credits)
Service course covering aliphatic and aromatic chemistry. Introduction to nomenclature, mechanism and synthesis. Lec/rec. CH 130 does not meet the prerequisites for this course.
Prerequisites: CH 123 with C- or better or CH 223 with C- or better or CH 226H with C- or better or ((CH 233 with C- or better or CH 233H with C- or better) and (CH 263 [C-] or CH 263H [C-] or CH 273 [C-]))
Recommended: One year of general chemistry
CH 332. ORGANIC CHEMISTRY. (4 Credits)
Service course covering aliphatic and aromatic chemistry. Introduction to nomenclature, mechanism and synthesis. Lec/rec.
Prerequisites: CH 331 with C- or better
Recommended: One year of general chemistry
CH 334. ORGANIC CHEMISTRY. (3 Credits)
Professional course for majors in chemistry, biochemistry, chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches.
Prerequisites: CH 334 with D- or better
Recommended: One year of general chemistry
CH 335. ORGANIC CHEMISTRY. (3 Credits)
Professional course for majors in chemistry, biochemistry, chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches.
Prerequisites: CH 335 with D- or better
Recommended: One year of general chemistry
CH 336. ORGANIC CHEMISTRY. (3 Credits)
Professional course for majors in chemistry, biochemistry, chemical engineering and other students who need a year of organic chemistry. In-depth treatment of major classes of organic compounds. Interrelation of mechanistic and synthetic approaches.
Prerequisites: CH 336 with D- or better
Recommended: One year of general chemistry
CH 337. ORGANIC CHEMISTRY LABORATORY. (4 Credits)
Laboratory course in organic chemistry for nonmajors, designed to supplement CH 331, CH 332, CH 334, CH 335, CH 336. Lec/lab.
Prerequisites: CH 331 with D- or better and CH 332 [D-] or (CH 334 [D-] and CH 335 [D-] and CH 336 [D-])
CH 361. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First term of integrated laboratory program for chemistry majors highlighting techniques in organic, physical, and analytical chemistry. First-hand experience is gained using specialized glassware, scientific equipment and instrumentation plus computers. Essential technical laboratory standards and technical writing are emphasized. Lec/lab.
Prerequisites: ((CH 221 with D- or better and CH 222 [D-] and CH 223 [D-]) or (CH 224H [D-] and CH 225H [D-] and CH 226H [D-]) or ((CH 231 [D-] or CH 231H [D-]) and (CH 261 [D-] or CH 261H [D-]) or CH 271 [D-]) and (CH 232 [D-] or CH 232H [D-] and CH 262 [D-] or CH 262H [D-] or CH 272 [D-]) or (CH 233 [D-] or CH 233H [D-]) and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-]) and (MTH 251 (may be taken concurrently) [D-] or MTH 251H (may be taken concurrently) [D-]) or (PH 201 (may be taken concurrently) [D-] or PH 211 (may be taken concurrently) [D-] and CH 334 (may be taken concurrently) [D-])
Equivalent to: CH 361H
CH 361H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First term of integrated laboratory program for chemistry majors highlighting techniques in organic, physical, and analytical chemistry. First-hand experience is gained using specialized glassware, scientific equipment and instrumentation plus computers. Essential technical laboratory standards and technical writing are emphasized. Lec/lab. 
Attributes: HNRS – Honors Course Designator 
Prerequisites: ((CH 221 with D- or better and CH 222 [D-] and CH 223 [D-]) or (CH 224H [D-] and CH 225H [D-] and CH 226H [D-]) or (CH 231 [D-] or CH 231H [D-]) and (CH 261 [D-] or CH 261H [D-] or CH 271 [D-]) and (CH 232 [D-] or CH 232H [D-]) and (CH 262 [D-] or CH 262H [D-] or CH 272 [D-]) and (CH 233 [D-] or CH 233H [D-]) and (CH 263 [D-] or CH 263H [D-] or CH 273 [D-]) and (MTH 251 (may be taken concurrently) [D-]) or MTH 251H (may be taken concurrently) [D-]) and (PH 201 (may be taken concurrently) [D-] or PH 211 (may be taken concurrently) [D-] or CH 334 (may be taken concurrently) [D-])
Equivalent to: CH 361

CH 362. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. 
Prerequisites: (CH 361 with D- or better or CH 361H with D- or better) and CH 335 (may be taken concurrently) [D-]
Equivalent to: CH 362H

CH 362H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
First-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. 
Attributes: HNRS – Honors Course Designator 
Prerequisites: (CH 361 with D- or better or CH 361H with D- or better) and CH 335 (may be taken concurrently) [D-]
Equivalent to: CH 362

CH 374. *TECHNOLOGY, ENERGY, AND RISK. (3 Credits)
Decision-making in a technical, democratic society. Discussion of current issues such as acid rain, toxic organic chemicals in the environment, energy resources, etc. Does not meet the prereq for any other chemistry course. Does not meet requirements for chemistry minor. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society 
Recommended: Completion of Bacc Core in physical science

CH 390. ENVIRONMENTAL CHEMISTRY. (3 Credits)
Sources, reactions, transport, effects, and fates of chemical species in water, soil, air, and living environments and the effects of technology thereon.
Prerequisites: CH 331 with D- or better or CH 334 with D- or better

CH 399. SPECIAL TOPICS. (1-16 Credits)
Discussion of special topics in chemistry. 
This course is repeatable for 99 credits.
Recommended: Completion of Bacc Core in the physical sciences

CH 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CH 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CH 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CH 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CH 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

CH 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator 
Equivalent to: CH 407
This course is repeatable for 16 credits.

CH 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CH 411. INORGANIC CHEMISTRY. (3 Credits)
Fundamental principles of inorganic chemistry including atomic structure, bonding models for molecules and solids, symmetry, acid/base chemistry, oxidation-reduction, and metal-ligand complexes.
Recommended: One year of general chemistry and college-level physics

CH 412. INORGANIC CHEMISTRY. (3 Credits)
Descriptive chemistry of the elements, focusing on main-group compounds, transition metal complexes, and solid-state chemistry.

CH 418. NUCLEAR CHEMISTRY. (3 Credits)
Radioactive decay, nuclear properties, nuclear structure, alpha, beta, and gamma decay, nuclear reactions, fission, interaction of radiation with matter, chemical techniques, radiation safety, and nuclear instrumentation.
Recommended: Concurrent enrollment in (CH 440 or CH 540) or PH 314

CH 421. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, instrumentation, and treatment of data.
Recommended: One year of general chemistry and one year of college physics. Concurrent enrollment in CH 440 or CH 540

CH 422. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, basic electronics and instrumentation, and treatment of data.
Recommended: One year of general chemistry and one year of college physics. Concurrent enrollment in CH 441 or CH 541

CH 424. BIOANALYTICAL CHEMISTRY. (3 Credits)
Analytical methods employed in the study of biologically important molecules. Separations (chromatography, electrophoresis), spectroscopy, mass spectrometry, biosensors, and immunoassays. Lec/lab. Not offered every year.
Recommended: One year of organic chemistry and one term of organic chemistry laboratory.

CH 435. STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS. (3 Credits)
Use of ultraviolet, infrared, nuclear magnetic resonance, and mass spectra for determination of structures and stereochemistry of complex organic molecules.
Prerequisites: CH 336 with D- or better and (CH 442 [D-] or CH 542 [D-])

CH 440. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Prerequisites: MTH 254 with D- or better or MTH 254H with D- or better
Recommended: One year of general chemistry and one year of college physics
CH 441. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Prerequisites: (CH 440 with C- or better or CHE 311 with C- or better) and (MTH 254 [C-] or MTH 254H [C-])

CH 442. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Prerequisites: (MTH 254 with D- or better or MTH 254H with D- or better) and CH 441 [D-]
Recommended: One year of general chemistry and one year of college physics

CH 450. INTRODUCTORY QUANTUM CHEMISTRY. (3 Credits)
Elementary wave mechanics and matrix mechanics of atoms and molecules. Quantum basis of chemical structure. Not offered every year.
Prerequisites: CH 442 with D- or better or CH 542 with D- or better
Recommended: One year college physics

CH 461. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 421 (may be taken concurrently) [D-] and CH 440 (may be taken concurrently) [D-]
Equivalent to: CH 461H

CH 461H. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic and physical chemistry. Lec/Lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 421 (may be taken concurrently) [D-] and CH 440 (may be taken concurrently) [D-]
Equivalent to: CH 461

CH 462. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 441 (may be taken concurrently) [D-] and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-])
Equivalent to: CH 462H
Recommended: CH 422

CH 462H. EXPERIMENTAL CHEMISTRY II. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 441 (may be taken concurrently) [D-] and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-])
Equivalent to: CH 462
Recommended: CH 422

CH 463. EXPERIMENTAL CHEMISTRY I. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-]) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 463H

CH 463H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and (CH 324 [D-] or CH 461 [D-] or CH 461H [D-]) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 463

CH 464. EXPERIMENTAL CHEMISTRY I. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 464H
Recommended: CH 461 or CH 461H or CH 324

CH 464H. EXPERIMENTAL CHEMISTRY I. (3 Credits)
Second-level integrated laboratory course for majors in chemistry and related disciplines, covering experimental techniques of analytical, inorganic, organic and physical chemistry. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Prerequisites: (CH 362 with D- or better or CH 362H with D- or better) and CH 442 (may be taken concurrently) [D-]
Equivalent to: CH 464
Recommended: CH 461 or CH 461H or CH 324

CH 471. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Principles of synthetic organic chemistry. Particular emphasis will be directed at understanding stereochemical outcomes in carbon-carbon bond-forming reactions (Diels-Alder, aldol, and pericyclic reactions). Other topics will include oxidation/reduction reactions, organometallic chemistry, and enantioselective methodologies.
Prerequisites: CH 336 with D- or better or CH 337 with D- or better

CH 490. COMPUTER PROGRAMMING FOR SCIENTISTS. (3 Credits)
Programming, numerical and graphical analysis, problem solving, simulations and use of databases for information handling and retrieval. Applications to problems in chemistry.
Prerequisites: MTH 252 with D- or better or MTH 252H with D- or better

CH 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

CH 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
CH 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CH 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CH 507. SEMINAR. (1-16 Credits)
Student should enroll in the seminar section that meets the specific divisional requirements for credits and grading scheme or that is designated for teaching or mentoring programs. Graded P/N. This course is repeatable for 16 credits.

CH 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CH 511. INORGANIC CHEMISTRY. (4 Credits)
Fundamental principles of inorganic chemistry including atomic structure, bonding models for molecules and solids, symmetry, acid/base chemistry, oxidation-reduction, metal-ligand complexes, sol-gel chemistry and nanochemistry.
Recommended: CH 442 or CH 542

CH 512. INORGANIC CHEMISTRY. (4 Credits)
Descriptive chemistry of the elements, focusing on main-group compounds, transition metal complexes, and solid-state chemistry.
Prerequisites: CH 511 with C or better

CH 513. SOLID STATE CHEMISTRY. (3-4 Credits)
Basic principles of chemistry are applied to descriptions of structure-property relationships in inorganic solids. Topics include crystal structure, materials synthesis, chemical bonding, electronic properties, optical properties, and magnetism. Students who register for 4 credits will perform independent study of an advanced topic based on research literature.
This course is repeatable for 4 credits.
Recommended: CH 442 or CH 542

CH 516. RADIOCHEMISTRY. (4 Credits)
Selected methods in radiochemical analysis. Actinide chemistry, activation analysis, radionuclide solvent extraction, and microbial reactions with radionuclides. Designed for majors in chemistry, chemical engineering, nuclear engineering, and radiation health physics. Lec/lab.
CROSSTRADED as CH 516/NSE 516.
Prerequisites: NE 531 with C or better or (RHP 531 with C or better and RHP 536 [C])
Equivalent to: CHE 516, NE 516, NSE 516, RHP 516
This course is repeatable for 12 credits.

CH 518. NUCLEAR CHEMISTRY. (3 Credits)
Radioactive decay, nuclear properties, nuclear structure, alpha, beta, and gamma decay, nuclear reactions, fission, interaction of radiation with matter, chemical techniques, radiation safety, and nuclear instrumentation.
Recommended: Concurrent enrollment in (CH 440 or CH 540) or PH 314

CH 521. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, instrumentation, and treatment of data.
Recommended: One year of college chemistry and physics. Concurrent enrollment in CH 540

CH 522. ANALYTICAL CHEMISTRY. (3 Credits)
A professional sequence for majors in chemistry and related disciplines. Chemical equilibrium, analytical electrochemistry, separations, spectroscopy, basic electronics and instrumentation, and treatment of data.
Recommended: One year of college chemistry and physics. Concurrent enrollment in CH 541

CH 524. BIOANALYTICAL CHEMISTRY. (3 Credits)
Analytical methods employed in the study of biologically important molecules. Separations (chromatography, electrophoresis), spectroscopy, mass spectrometry, biosensors, and immunoassays. Lec/lab. Not offered every year.
Equivalent to: VM 524, VMB 524
Recommended: One year of organic chemistry and one term of organic chemistry laboratory.

CH 535. STRUCTURE DETERMINATION BY SPECTROSCOPIC METHODS. (3 Credits)
Use of ultraviolet, infrared, nuclear magnetic resonance, and mass spectra for determination of structures and stereochemistry of complex organic molecules.
Recommended: CH 336 and (CH 442 or CH 542)

CH 540. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Recommended: MTH 254 and one year of college chemistry and one year of college physics

CH 541. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Recommended: (CH 440 or CHE 311) AND (MTH 254 or MTH 254H)

CH 542. PHYSICAL CHEMISTRY. (3 Credits)
Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.
Recommended: CH 541

CH 550. INTRODUCTORY QUANTUM CHEMISTRY. (3 Credits)
Elementary wave mechanics and matrix mechanics of atoms and molecules. Quantum basis of chemical structure. Not offered every year.
Prerequisites: CH 542 with C or better
Recommended: One year college physics

CH 553. CHEMICAL THERMODYNAMICS. (3 Credits)
The laws of chemical thermodynamics applied to analyze properties of gases, gas mixtures, liquid solutions, fluctuations, critical phenomena, and magnetic systems. Not offered every year.
Recommended: CH 542

CH 571. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Principles of synthetic organic chemistry. Particular emphasis will be directed at understanding stereochemical outcomes in carbon-carbon bond-forming reactions (Diels-Alder, aldol, and pericyclic reactions). Other topics will include oxidation/reduction reactions, organometallic chemistry, and enantioselective methodologies.
Recommended: CH 336 or CH 337
CH 582. CHEMISTRY AND MATERIALS OF BATTERIES AND SUPER CAPACITORS. (3 Credits)
Examines the chemistry and materials currently in use and proposed for future primary and secondary batteries and supercapacitors. After a brief historical review, we will examine in detail the state-of-the-art technologies including lithium-ion, lithium, and sodium-sulfur batteries and electrochemical double-layer capacitors, and future technologies such as metal-air and lithium-sulfur. Class discussions will focus on structure/performance relationships and other issues such as environmental impact, safety and cost. Offered via Ecampus only.
Recommended: Full year of general chemistry, college-level physics and materials science background

CH 584. INSTRUMENTS AND ONLINE INTERACTIONS IN THE SCIENCES. (3 Credits)
Examine methods and technologies for and incorporating virtual instruments and online interactions into laboratory courses to support learners in becoming critical thinkers and creative producers of their knowledge and understanding in science.
Recommended: Basic computer literacy and one year of general chemistry, physics or biology

CH 590. COMPUTER PROGRAMMING FOR SCIENTISTS. (3 Credits)
Programming, numerical and graphical analysis, problem solving, simulations and use of databases for information handling and retrieval. Applications to problems in chemistry.
Recommended: MTH 252

CH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CH 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CH 607. SEMINAR. (1-16 Credits)
Student should enroll in the seminar section that meets the specific divisional requirements for credits and grading scheme or that is designated for teaching or mentoring programs.
This course is repeatable for 16 credits.

CH 614. SELECTED TOPICS IN INORGANIC CHEMISTRY. (4 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in fields such as solid state chemistry, theoretical inorganic chemistry, spectroscopy and magnetism, chemistry of coordination compounds, kinetics and mechanisms of inorganic reactions, acid-base theory and reactions in nonaqueous solvents, organometallic chemistry, and chemistry of the less familiar elements. Not offered every year.
Equivalent to: CH 514
This course is repeatable for 8 credits.
Recommended: CH 413 or CH 513

CH 615. SELECTED TOPICS INORGANIC CHEMISTRY. (4 Credits)
Focus is on cutting edge research topics in inorganic materials chemistry, which will evolve from year-to-year to stay up-to-date. Current journal articles, software programs, and lab demonstrations will be utilized. Students will learn both content of a research area, as well as tools used in the practice.

CH 616. CRYSTALLOGRAPHY AND X-RAY DIFFRACTION. (4 Credits)
Principles of crystallography and x-ray diffraction as applied to the structural characterization of both single crystals, powders, and thin films.
Equivalent to: CH 516
Recommended: At least one upper-level undergraduate inorganic chemistry course

CH 630. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Molecular orbital bonding theory, orbital symmetry, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. Not offered every year.
Equivalent to: CH 530
Recommended: CH 336 and (CH 442 or CH 542)

CH 631. ADVANCED ORGANIC CHEMISTRY. (4 Credits)
Carbon-carbon bond forming reactions, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. Not offered every year.
Equivalent to: CH 531
Recommended: CH 630

CH 632. ADVANCED ORGANIC CHEMISTRY. (3 Credits)
Molecular orbital bonding theory, orbital symmetry, reaction mechanisms, stereoisomerism, conformational analysis, and advanced methods of synthesis. Not offered every year.
Equivalent to: CH 532
Recommended: CH 336 and (CH 442 or CH 542)

CH 633. HYPOTHESIS, EVIDENCE, AND ARGUMENT IN ORGANIC CHEMISTRY. (2 Credits)
Immerses the student in the tools of scientific method as applied to current research topics in the chemical literature. The student will perform an extensive review of a modern topic in organic chemistry, prepare a written summary and analysis of this literature review and make a public oral presentation and discussion.
Prerequisites: CH 632 with C or better
This course is repeatable for 4 credits.

CH 636. SELECTED TOPICS IN ORGANIC CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with recent advances in organic chemistry and their application to special fields of study. Topics covered vary from term to term and year to year. Topics include: theoretical organic chemistry, recent advances in reaction mechanisms, advanced synthesis, free radical reactions, organic sulfur chemistry, and biosynthesis of natural products. CH 636, CH 637, CH 638 need not be taken in order. Not offered every year.
Equivalent to: CH 536
This course is repeatable for 12 credits.

CH 637. SELECTED TOPICS IN ORGANIC CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with advances in organic chemistry, specifically focusing on biosynthesis of natural products and enzyme reaction mechanisms. CH 636, CH 637, CH 638 need not be taken in order.
Equivalent to: CH 537
This course is repeatable for 12 credits.
CH 638. SELECTED TOPICS IN ORGANIC CHEMISTRY. (3 Credits)
Nonsequence courses designed to acquaint students with recent advances in organic chemistry and their application to special fields of study. Topics covered vary from term to term and year to year. Topics include: theoretical organic chemistry, recent advances in reaction mechanisms, advanced synthesis, free radical reactions, organic sulfur chemistry, and biosynthesis of natural products. CH 636, CH 637, CH 638 need not be taken in order. Not offered every year.
Equivalent to: CH 538
This course is repeatable for 12 credits.

CH 651. QUANTUM MECHANICS OF ATOMS AND MOLECULES. (3 Credits)
Not offered every year.
Equivalent to: CH 551
Recommended: CH 450 or CH 550

CH 652. QUANTUM MECHANICS OF MOLECULAR SPECTROSCOPY. (3 Credits)
Not offered every year.
Equivalent to: CH 552
Recommended: CH 651

CH 660. SPECTROCHEMICAL ANALYSIS. (3 Credits)
Theoretical concepts and methodology of optical spectrochemical methods of analysis, components of spectrometers, flame and electrothermal atomic spectrophotometry, ICP atomic emission spectrometry, molecular absorption and fluorescence spectrometry.
Equivalent to: CH 560
Recommended: CH 442 or CH 542

CH 661. SEPARATIONS: CHROMATOGRAPHY AND RELATED METHODS. (4 Credits)
Theory, instrumentation, and practice of modern separation techniques (gas chromatography, liquid chromatography, electrophoretic separations) and sample preparation methods; handling and interpretation of chromatographic and electrophoretic data.
Equivalent to: CH 561
Recommended: CH 440 or CH 540

CH 662. ANALYTICAL ELECTROCHEMISTRY. (4 Credits)
Study of current, voltage and time relationships in electrochemical cells. Offered alternate years.
Equivalent to: CH 562
Recommended: CH 442

CH 681. SELECTED TOPICS IN PHYSICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint students with recent advances in physical chemistry. Topics include molecular structure determination (x-ray, electron and neutron diffraction), spectroscopy (nonlinear and multiphoton, magnetic resonance, photoelectron, Moessbauer effect), physical chemistry of condensed phases (ionic, molecular and liquid crystals, critical phenomena, mass transport), theoretical chemistry (chemical bonding, scattering theory, group theory, dynamics), electronic structure theory of molecules. Need not be taken in order. Not offered every year.
Equivalent to: CH 581
This course is repeatable for 12 credits.

CH 682. SELECTED TOPICS IN PHYSICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint students with recent advances in physical chemistry. Topics include molecular structure determination (x-ray, electron and neutron diffraction), spectroscopy (nonlinear and multiphoton, magnetic resonance, photoelectron, Moessbauer effect), physical chemistry of condensed phases (ionic, molecular and liquid crystals, critical phenomena, mass transport), theoretical chemistry (chemical bonding, scattering theory, group theory, dynamics), electronic structure theory of molecules. Need not be taken in order. Not offered every year.
Equivalent to: CH 582
This course is repeatable for 12 credits.

CH 683. SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. Not offered every year.
Equivalent to: CH 583
This course is repeatable for 12 credits.

CH 684. SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. Not offered every year.
Equivalent to: CH 584
This course is repeatable for 12 credits.

CH 685. SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in analytical chemistry. Not offered every year.
Equivalent to: CH 585
This course is repeatable for 12 credits.

CH 686. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. Not offered every year.
Equivalent to: CH 586
This course is repeatable for 12 credits.

CH 687. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. Not offered every year.
Equivalent to: CH 587
This course is repeatable for 12 credits.
CH 688. SELECTED TOPICS IN NUCLEAR AND RADIATION CHEMISTRY. (2 Credits)
Nonsequence courses designed to acquaint the advanced graduate student with recent advances in nuclear and radiation chemistry. Not offered every year.
Equivalent to: CH 588
This course is repeatable for 12 credits.

CH 692. ENVIRONMENTAL TRANSFORMATION OF ORGANIC COMPOUNDS. (3 Credits)
Chemical, photochemical, and biological transformation reactions of organic compounds in the environment. Test methods and predictive models for determining the persistence of organic compounds in the environment. Offered alternate years.
Recommended: CH 336 and CH 440

CH 697. MASS SPECTROMETRY OF ORGANIC COMPOUNDS. (4 Credits)
Physical principles of mass spectrometric instrumentation and interpretation of the mass spectra of organic compounds and biomolecules. Not offered every year.
Equivalent to: TOX 637

Chinese (CHN)

CHN 111. FIRST-YEAR CHINESE. (4 Credits)
Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111, CHN 112, CHN 113. Lec/rec.

CHN 112. FIRST-YEAR CHINESE. (4 Credits)
Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111, CHN 112, CHN 113. Lec/Rec.
Prerequisites: CHN 111 with D- or better

CHN 113. FIRST-YEAR CHINESE. (4 Credits)
Essentials of colloquial Mandarin with emphasis on conversation, reading, and writing. Designed for students with no prior training in Chinese. Native and/or bilingual speakers of Chinese will not receive credit for CHN 111, CHN 112, CHN 113. Lec/Rec.
Prerequisites: CHN 112 with D- or better

CHN 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

CHN 211. SECOND-YEAR CHINESE. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211, CHN 212, CHN 213. Completion of CHN 213 with grade of C- or better satisfies BA requirement in foreign languages. Lec/Rec.
Prerequisites: CHN 113 with C- or better

CHN 212. SECOND-YEAR CHINESE. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211, CHN 212, CHN 213. Completion of CHN 213 with grade of C- or better satisfies BA requirement in foreign languages. Lec/discussion/activity.
Prerequisites: CHN 211 with D- or better

CHN 213. SECOND-YEAR CHINESE. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Emphasis on conversational fluency and increased vocabulary. Native and/or bilingual speakers of Chinese will not receive credit for CHN 211, CHN 212, CHN 213. Completion of CHN 213 with grade of C- or better satisfies BA requirement in foreign languages. Lec/discussion.
Prerequisites: CHN 212 with C- or better

CHN 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

CHN 311. THIRD-YEAR CHINESE LANGUAGE. (3 Credits)
Further development of listening, speaking, reading, and writing skills to a more advanced level with emphasis on the practical application of the Chinese language.
Prerequisites: CHN 213 with C- or better

CHN 312. THIRD-YEAR CHINESE LANGUAGE. (3 Credits)
Further development of listening, speaking, reading, and writing skills to a more advanced level with emphasis on the practical application of the Chinese language.
Prerequisites: CHN 311 with C- or better

CHN 313. THIRD-YEAR CHINESE LANGUAGE. (3 Credits)
Further development of listening, speaking, reading, and writing skills to a more advanced level with emphasis on the practical application of the Chinese language.
Prerequisites: CHN 312 with C- or better

CHN 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students, with assignments as proctor or tutor in lower-division Chinese courses. May be repeated for credit. No credit may be used to satisfy requirements for a minor in Chinese. Graded P/N.
This course is repeatable for 6 credits.
Recommended: Completion of third-year Chinese with a minimum 3.0 GPA in that sequence

CHN 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CHN 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

CHN 411. FOURTH-YEAR CHINESE (NEWSPAPER CHINESE). (3 Credits)
Development of reading, writing, and speaking skills at a more advanced level; reading of newspaper articles from China, Taiwan, and other sources; oral reports and compositions in Chinese. Not offered every year.
Recommended: CHN 313

CHN 412. FOURTH-YEAR CHINESE (NEWSPAPER CHINESE). (3 Credits)
Development of reading, writing, and speaking skills at a more advanced level; reading of newspaper articles from China, Taiwan, and other sources; oral reports and compositions in Chinese. Not offered every year.
Recommended: CHN 411

CHN 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.
CCE 101. CIVIL AND CONSTRUCTION ENGINEERING ORIENTATION. (2 Credits)
Introduction to civil and construction engineering professions; problem solving, communication skills. This course is required by the CE, CEM and FE programs.
Equivalent to: CE 101
Recommended: MTH 111 and completion or concurrent enrollment in MTH 112 or MTH 251

CCE 102. CIVIL AND CONSTRUCTION ENGINEERING: PROBLEM-SOLVING AND TECHNOLOGY. (3 Credits)
A skills-based course that focuses on introducing freshman students to the use of hand calculation and computer technology in solving civil engineering and construction engineering problems. Topics to be covered include structured approach to problem solving, use of Excel for engineering applications, internet tools and data bases, homework professionalism. Opportunities for involvement with ASCE and AGC student chapters. Lec/lab.
Equivalent to: CE 102
Recommended: Completion or concurrent enrollment in MTH 112 or MTH 251

CCE 201. CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN. (3 Credits)
Introduces the engineering design process and graphic skills that are used by civil and construction engineers. Topics include design process, geometric construction, multiviews, auxiliary views, sections, dimensioning, tolerances and engineering drawing standards. Students participate in team design projects and presentations. Graphic and design projects from the areas of civil and construction engineering. Lec/lab.
Prerequisites: MTH 111 with C or better or MTH 112 (may be taken concurrently) or MTH 241 (may be taken concurrently) and (ST 314 [C] or BA 276 [C])
Equivalent to: CE 201

CCE 203. INTRODUCTION TO VIRTUAL DESIGN AND CONSTRUCTION. (3 Credits)
Basic principles of virtual design and construction (VDC) focusing on skills required for generating design and construction information models. Parametric modeling and design constraints are introduced. Students will utilize construction drawings and documentation to create accurate 3D models. Use of design and construction information models for making estimates of quantities and cost, and for determination of constructability problems. Lec/lab.
Prerequisites: CCE 201 with C or better or ENGR 248 with C or better

CCE 207. CCE SEMINAR. (1 Credit)
Professional practices of civil and construction engineering.
Recommended: Sophomore standing

CCE 321. CIVIL AND CONSTRUCTION ENGINEERING MATERIALS. (4 Credits)
Highway materials; aggregate, concrete and asphalt. Standard test methods.
Prerequisites: ((ENGR 213 with C or better or ENGR 213H with C or better) and (ST 314 [C] or BA 276 [C]))
Equivalent to: CCE 321H, CE 321

CCE 321H. CIVIL AND CONSTRUCTION ENGINEERING MATERIALS. (4 Credits)
Highway materials; aggregate, concrete and asphalt. Standard test methods.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (ST 314 [C] or BA 276 [C])
Equivalent to: CCE 321

CCE 421. ADVANCED CONCRETE PROPERTIES AND PERFORMANCE. (4 Credits)
Cement production, hydration, supplementary cementitious materials, mixture design and proportioning, heat of hydration, volume stability, shrinkage, cracking, expansion, creep, relaxation, admixtures, alternative binders, strength gain, durability.
Prerequisites: CCE 321 with C or better

CCE 422. GREEN BUILDING MATERIALS. (3 Credits)
Introduces concepts of construction with green building materials. Specific concepts include evaluation of what truly makes a material ‘green’, long-term performance (e.g., durability) of materials, material production and life cycle cost analysis. Concepts of green building programs, guidelines and specifications will be introduced.
Prerequisites: CE 321 with C or better or CCE 321 with C or better
Recommended: (ECON 201 or ECON 201H or ECON 202 or ECON 202H) and ST 314

CCE 423. CONCRETE FUNDAMENTALS. (4 Credits)
Portland cement hydration, microstructural development, fresh and hardened properties, testing standards, durability, alternative cements.
Recommended: CCE 321

CCE 424. ASPHALT FUNDAMENTALS. (3 Credits)
Focuses on characterization of asphalt materials and mixtures, current laboratory testing technology for asphalt binders and mixes, engineering of asphalt mixes to meet design requirements, asphalt recycling process, environmental impacts of asphalt pavements, and recent developments in asphalt technology.
Prerequisites: CCE 321 with C or better

CCE 520. SELECTED TOPICS IN INFRASTRUCTURE MATERIALS. (0-4 Credits)
A critical examination of in-depth topics selected by the instructor from among topics not covered in other infrastructure materials courses. This course is repeatable for 16 credits.

CCE 522. GREEN BUILDING MATERIALS. (3 Credits)
Introduces concepts of construction with green building materials. Specific concepts include evaluation of what truly makes a material ‘green’, long-term performance (e.g., durability) of materials, material production and life cycle cost analysis. Concepts of green building programs, guidelines and specifications will be introduced.
Recommended: (CE 321 or CCE 321) and (ECON 201 or ECON 201H or ECON 202 or ECON 202H) and ST 314

CCE 523. CONCRETE FUNDAMENTALS. (4 Credits)
Portland cement hydration, microstructural development, fresh and hardened properties, testing standards, durability, alternative cements.
Recommended: CCE 321 or similar introductory materials course or CCE 421
CCE 524. ASPHALT FUNDAMENTALS. (3 Credits)
Focuses on characterization of asphalt materials and mixtures, current laboratory testing technology for asphalt binders and mixes, engineering of asphalt mixes to meet design requirements, asphalt recycling process, environmental impacts of asphalt pavements, and recent developments in asphalt technology.

CCE 525. CONSTRUCTION SITE SYSTEMS ENGINEERING. (3 Credits)
Design and planning of construction site field operations and engineered systems. Systems analysis and design as it applies to civil engineering projects. Design of construction systems: blasting; rock crushing and conveying; dewatering; cranes, pile driving, and rigging; and concrete pumping and placement. Construction site design and process design.

CCE 526. DESIGN FOR SAFETY. (3 Credits)
Theoretical concepts and industry practices used to model, evaluate, and improve construction worker safety through the design of the project features, construction operations, and site safety program elements. Causes of construction site accidents, hazard recognition and comprehension, safety risk valuation and mitigation, and the true costs of injuries and fatalities.

CCE 528. ADVANCED VIRTUAL DESIGN AND CONSTRUCTION. (4 Credits)
Focusing on the skills and information needed to effectively use an existing Building Information Model (BIM) in plan execution for a building construction project. This is a project based course where students gain knowledge on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction and operations.

Recommended: CCE 203 [D-]

CCE 529. LEAN CONSTRUCTION. (3 Credits)
Introduction to the basics of lean production management, especially about how they are applied to the AEC industry to improve the operation management and product development. Class topics include theory of manufacturing science, principles of the lean production system, application of production management to project management, variability management in design and construction, improving project performance in the AEC industry, data gathering and process evaluation for productivity improvement.

CCE 552. PROJECT RISK MANAGEMENT. (4 Credits)
An introduction to the concept of project risk in producing constructed engineering projects. Course content includes project baselining, risk definition and identification, risk assessment and management techniques, risk control, risk response, and risk management. CROSSLISTED as CCE 552/IE 586.

Equivalent to: IE 586

CCE 554. PROFESSIONAL RESPONSIBILITY AND ETHICS. (3 Credits)
An in-depth exploration of professional engineering ethics. Course content includes conceptual theoretical basis of ethics, ethics among professional organizations, ethical consideration of design, critical analysis of ethical situations, ethics in the workplace, and ethical considerations regarding the broader environment. CROSSLISTED as CCE 554/IE 589.

Equivalent to: IE 589

CCE 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

CCE 621. DURABILITY AND CONDITION ASSESSMENT OF REINFORCED CONCRETE. (4 Credits)
Concrete durability including freeze-thaw attack, sulfate attack, corrosion, alkali-silica reaction, long-term performance, durability modeling, durability of alternative cements. Non-destructive condition assessment; model-assisted testing; corrosion detection and monitoring; multi-scale assessment; service/remaining life predictions.

Prerequisites: CCE 523 with C or better
Recommended: CCE 321

CCE 623. CORROSION OF METALS AND CORROSION CONTROL. (4 Credits)

Recommended: CH 202 or CH 231 or CH 231H or CCE 321

CCE 624. SERVICE LIFE MODELING OF INFRASTRUCTURE MATERIALS. (4 Credits)

Recommended: Undergraduate level calculus and chemistry courses

Civil Engineering (CE)

CE 199. SPECIAL TOPICS. (1-4 Credits)

CE 202. CIVIL ENGINEERING: GEOSPATIAL INFORMATION AND GIS. (3 Credits)
Introductory design principles presented with the use of GIS and geospatial information (remote sensing, GPS, surveying, and aerial photography) for civil engineering problem solving. Introduction to the integration of geospatial data and analysis for decision making and management for site selection, mitigation, change analysis, modeling and assessment. Standard software and custom programming used in course. Students participate in both individual and team projects and presentations. Projects from the area of civil engineering. Lec/lab.

Prerequisites: CE 201 with C or better or CCE 201 with C or better or ENGR 248 with C or better

Equivalent to: CE 201 with C or better or CCE 201 with C or better or ENGR 248 with C or better

CE 299. SPECIAL TOPICS. (1-4 Credits)
Graded P/N.

Equivalent to: CE 299H

CE 299H. SPECIAL TOPICS. (1-4 Credits)
Graded P/N.

Attributes: HNRS – Honors Course Designator

Equivalent to: CE 299

CE 301. CE JUNIOR SEMINAR. (1 Credit)
Professional practices of civil engineering.
CE 311. FLUID MECHANICS. (4 Credits)
Fluid properties, fluid statics, fluid motion, conservation of mass, momentum and energy for incompressible fluids, dimensional analysis, civil engineering applications.
**Prerequisites:** (MTH 256 with C or better or MTH 256H with C or better) and PH 213 [C] and ENGR 213 [C] and ENGR 212 [C]

CE 313. HYDRAULIC ENGINEERING. (4 Credits)
Analysis of large civil engineering fluid systems including conduit flow, multiple reservoirs, pipe networks, pumps, turbines, open channel flow, and hydraulic structures.
**Prerequisites:** CE 311 with C or better or CHE 331 with C or better or CHE 331H with C or better

CE 361. SURVEYING THEORY. (4 Credits)
Use of surveying equipment, Gaussian error theory applied to measurements, calculations of position on spherical and plane surfaces, state plane coordinate systems, introduction to global positioning systems.
**Prerequisites:** (CCE 201 with C or better or CE 202 with C or better) and ENGR 213 [C] and PH 213 [C] and ST 314 [C]

CE 365. HIGHWAY LOCATION AND DESIGN. (3 Credits)
Curve problems in highway design, including circular, vertical, compound curves and spirals; earth distribution analysis; preliminary office studies; paper location procedures and field layout problems.
**Prerequisites:** CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 372. GEOTECHNICAL ENGINEERING I. (4 Credits)
Basic soil mechanics including the identification and classification of soil, principles of compaction and consolidation, flow through porous media, effective stress, and shear strength. Lec/lab.
**Prerequisites:** ENGR 213 with C or better or ENGR 213H with C or better and (CE 311 (may be taken concurrently) [C] or CEM 311 (may be taken concurrently) [C] or CHE 331 (may be taken concurrently) [C] or CHE 331H (may be taken concurrently) [C]) and CH 201 [C] and PH 212 [C]

CE 373. GEOTECHNICAL ENGINEERING II. (4 Credits)
Application of fundamental soil mechanics principles to analyses of slope stability, retaining structures, and foundation support. Lec/rec.
**Prerequisites:** CE 372 with C or better or FE 315 with C or better

CE 381. STRUCTURAL THEORY I. (4 Credits)
Analysis of statically determinate structures (beams, frames, trusses, arches, and cables). Approximate analysis, influence lines, deflections.
**Prerequisites:** ENGR 213 with C or better or ENGR 213H with C or better and (CE 311 (may be taken concurrently) [C] or CEM 311 (may be taken concurrently) [C] or CHE 331 (may be taken concurrently) [C] or CHE 331H (may be taken concurrently) [C]) and CH 201 [C] and PH 212 [C]

CE 382. STRUCTURAL THEORY II. (4 Credits)
Analysis of statically indeterminate structures (beams, frames, trusses). Deflections. Energy methods, introduction to matrix methods.
**Prerequisites:** CE 381 with C or better and (MTH 306 [C] or MTH 306H [C] or (MTH 264 [C] and MTH 265 [C]))

CE 383. DESIGN OF STEEL STRUCTURES. (4 Credits)
Introduction to design of steel members, connections and structural systems. Lec/lab.
**Prerequisites:** CE 382 with C or better

CE 392. INTRODUCTION TO HIGHWAY ENGINEERING. (4 Credits)
Highway engineering standards, geometric design, cross section and roadside design, highway surfaces, pavement design, highways and the environment, highway construction and maintenance.
**Prerequisites:** (ENGR 212 with C or better or ENGR 212H with C or better) and CE 361 [C]

CE 401. RESEARCH. (1-16 Credits)
*This course is repeatable for 16 credits.*

CE 403. THESIS. (1-16 Credits)
*This course is repeatable for 16 credits.*

CE 405. READING AND CONFERENCE. (1-16 Credits)
*This course is repeatable for 16 credits.*

CE 406. PROJECTS. (1-16 Credits)
*This course is repeatable for 16 credits.*

CE 407. SEMINAR. (1-3 Credits)
Understanding complexity and systems thinking.
**Equivalent to:** CE 407H
*This course is repeatable for 16 credits.*

CE 407H. SEMINAR. (1-3 Credits)
Understanding complexity and systems thinking.
**Attributes:** HNRS – Honors Course Designator
**Equivalent to:** CE 407
*This course is repeatable for 16 credits.*

CE 408. WORKSHOP. (1-3 Credits)
*This course is repeatable for 3 credits.*

CE 410. INTERNSHIP. (1-12 Credits)
*This course is repeatable for 16 credits.*

CE 411. OCEAN ENGINEERING. (4 Credits)
Introduction to linear wave theory and wave forces on piles. Guided design of wave gauge facility at Coos Bay, Oregon, that requires synthesizing fluid mechanics, structural design and foundation design.
**Prerequisites:** CE 313 with C or better or CEM 311 with C or better

CE 412. HYDROLOGY. (4 Credits)
Fundamentals of hydrology, the hydrologic cycle, precipitation, streamflow, hydrograph analysis and hydrologic measurements.
**Prerequisites:** CE 313 with C or better

CE 413. GIS IN WATER RESOURCES. (3 Credits)
Course presents Geographic Information System (GIS) technology for developing solutions to water resource problems: water quality, availability, flooding, the natural environment, and management of water resources. Typical GIS data models for hydrologic information are presented. Synthesis of geospatial and temporal water resources to support hydrologic analysis and modeling are covered.
**Recommended:** Senior standing or a previous introductory GIS course

CE 415. COASTAL INFRASTRUCTURE. (3 Credits)
Planning and design criteria of coastal infrastructure, including breakwaters, jetties, sea walls, groins, piers, submerged pipelines, harbor design, and tsunami defense. Use of laboratory models, numerical simulations, and field observations for design.
**Prerequisites:** CE 313 with C or better

CE 417. HYDRAULIC ENGINEERING DESIGN. (4 Credits)
Theory, planning, analysis, and design of hydraulic structures. Application of basic principles detailed analysis and design. Engineering planning and design of water resource systems.
**Prerequisites:** CE 313 with C or better

CE 418. CIVIL ENGINEERING PROFESSIONAL PRACTICE. (3 Credits)
Engineering career paths; ethics and professionalism, project planning, execution and delivery; team building/management; marketing proposals; engineering overseas; dispute resolution; partnering; effective decision making; uncertainty and risk analysis; and current industry design and construction methods. (Writing Intensive Course)
**Attributes:** CWIC – Core, Skills, WIC
**Prerequisites:** CE 382 with C or better and CE 313 [C] and (CE 372 [C] or FE 315 [C])
**Equivalent to:** CE 454
CE 419. CIVIL INFRASTRUCTURE DESIGN. (3 Credits)
A capstone design project experience exposing students to problems and issues similar to those encountered in the practice of civil engineering. Students should have completed ALL other required courses in their degree program prior to registering for this course. Lec/rec.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CE 418 with C or better

CE 420. ENGINEERING PLANNING. (4 Credits)
The application of systems analysis to structuring, analyzing, and planning for civil engineering projects. Concept of the system and its environment; setting goals, objectives, and standards; evaluation criteria; solution generation and analysis; evaluation and optimization. Project management using precedence node diagramming; resource allocation and leveling; time-cost trade-off; and PERT.

CE 424. CONTRACTS AND SPECIFICATIONS. (4 Credits)
Fundamentals of construction industry contracts, including technical specifications, and issues related to time, money, warranty, insurance, and changed conditions.
Prerequisites: CEM 442 with C or better

CE 427. TEMPORARY CONSTRUCTION STRUCTURES. (4 Credits)
Design and construction of temporary structures including formwork, shoring, and earth retaining structures.
Prerequisites: (CE 321 with C or better or CCE 321 with C or better) and (FE 315 [C] or CE 372 [C]) and (CEM 383 [C] or CE 383 [C])

CE 428. PROJECT MANAGEMENT FOR CIVIL ENGINEERS. (4 Credits)
Provides the prospective civil engineer with the technical knowledge and familiarity necessary to successfully and confidently manage projects of different sizes and complexity levels. It relies on basic knowledge and techniques developed by the Project Management Institute (PMI) and real-world examples (through lectures, example projects, case studies, and guest speakers) from the public and private sectors.

CE 429. OPTIMIZATION IN WATER RESOURCES ENGINEERING. (3 Credits)
Introduction to problem formulation and optimization techniques for design of complex water resources systems.
Recommended: CE 412

CE 461. PHOTOGRAMMETRY. (3 Credits)
Geometry of terrestrial and vertical photographs, flightline planning, stereoscopy and parallax, stereoscopic plotting instruments, analytical photogrammetry, orthophotography, introduction to photo interpretation, and aerial cameras.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 463. CONTROL SURVEYING. (4 Credits)
Global Positioning Systems (GPS) theory, networks, and fieldwork; control specifications, methods and problems in obtaining large area measurements; precise leveling; network adjustments using least square techniques; field instrument adjustments.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 465. OREGON LAND SURVEY LAW. (3 Credits)
Introduction to U.S. public land survey; Oregon state statutes, common law decisions, and administrative rules dealing with boundary law; case studies; unwritten land transfers; original and resurvey platting laws; guarantees of title; deed descriptions.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 469. PROPERTY SURVEYS. (3 Credits)
U.S. public land survey: restoration of corners, subdivision of sections; topographic mapping; subdivision and partition plats, resurvey plats, subdivision design; introduction to LIS/GIS; field astronomy.
Prerequisites: CE 361 with C or better or CEM 263 with C or better or FE 208 with C or better

CE 471. FOUNDATIONS FOR STRUCTURES. (3 Credits)
Criteria, theory, design, and construction for foundations of structures; use of in-situ tests for geotechnical engineering; computer applications.
Prerequisites: CE 373 with C or better or FE 316 with C or better

CE 479. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSLISTED as CE 479/FE 479 and CE 579/FE 579.
Prerequisites: CE 373 with C or better or FE 316 with C or better
Equivalent to: FE 479

CE 481. REINFORCED CONCRETE I. (4 Credits)
Basic principles of reinforced concrete design; strength, stability, and serviceability criteria; design of reinforced concrete members for flexure and shear. Detailing, development length and splices.
Prerequisites: CE 382 with C or better

CE 482. MASONRY DESIGN. (3 Credits)
A critical examination in depth of masonry design topics.
Prerequisites: CE 481 with C or better

CE 484. WOOD DESIGN. (4 Credits)
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab.
Prerequisites: CE 383 with C or better or CE 481 with C or better
Equivalent to: WSE 458

CE 486. PRESTRESSED CONCRETE. (3 Credits)
Prestressed concrete analysis and design, systems of prestressing, materials, economics.
Prerequisites: CE 481 with C or better

CE 489. SEISMIC DESIGN FUNDAMENTALS. (3 Credits)
Fundamentals of earthquake engineering, introduction to structural dynamics principles, response spectra, and ASCE 7 design and analysis provisions.
Prerequisites: CE 481 with C or better and CE 383 [C-]

CE 491. TRANSPORTATION ENGINEERING. (3 Credits)
Introduction to transportation engineering systems characteristics, traffic estimation, comprehensive transportation planning, highway economics, driver and vehicle characteristics, highway operations and capacity, signalization and control. Introduction to intelligent transportation.
Prerequisites: CE 392 with C or better and ST 314 [C]

CE 492. PAVEMENT STRUCTURES. (3 Credits)
Design and rehabilitation of pavement structures for streets, highways, and airports.
Prerequisites: CE 392 with C or better

CE 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
CE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

CE 508. WORKSHOP. (1-3 Credits)
Graded P/N.
This course is repeatable for 3 credits.

CE 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

CE 511. OCEAN ENGINEERING. (4 Credits)
Introduction to linear wave theory and wave forces on piles. Guided
design of wave gauge facility at Coos Bay, Oregon, that requires
synthesizing fluid mechanics, structural design and foundation design.
Recommended: CE 313 or CEM 311

CE 512. HYDROLOGY. (4 Credits)
Fundamentals of hydrology, the hydrologic cycle, precipitation,
streamflow, hydrograph analysis and hydrologic measurements.

CE 513. GIS IN WATER RESOURCES. (3 Credits)
Course presents Geographic Information System (GIS) technology
for developing solutions to water resource problems: water quality,
availability, flooding, the natural environment, and management
of water resources. Typical GIS data models for hydrologic information
are presented. Synthesis of geospatial and temporal water resources to
support hydrologic analysis and modeling are covered.
Recommended: Senior standing or a previous introductory GIS course

CE 514. GROUNDWATER HYDRAULICS. (4 Credits)
Principles of groundwater flow and chemical transport in confined and
unconfined aquifers, aquifer testing and well construction. Design of
dewatering and contaminant recovery systems.
Prerequisites: CE 547 with B or better
Equivalent to: BEE 514
Recommended: CE 313 and MTH 252

CE 515. COASTAL INFRASTRUCTURE. (3 Credits)
Planning and design criteria of coastal infrastructure, including
breakwaters, jetties, sea walls, groins, piers, submerged pipelines, harbor
design, and tsunami defense. Use of laboratory models, numerical
simulations, and field observations for design.
Recommended: CE 313

CE 516. STORMWATER DESIGN AND MANAGEMENT. (4 Credits)
Introduction to urban stormwater drainage systems; urban hydrologic
analysis; water quality in urban storm water; design of stormwater
control systems; low impact development; storm water monitoring; and
computer modeling of urban storm water systems.
Prerequisites: CE 512 with C or better or BEE 512 with C or better

CE 517. HYDRAULIC ENGINEERING DESIGN. (4 Credits)
Theory, planning, analysis, and design of hydraulic structures. Application
of basic principles detailed analysis and design. Engineering planning
and design of water resource systems.
Recommended: CE 313

CE 518. GROUNDWATER MODELING. (4 Credits)
Application of numerical methods to the solution of water flow and solute
transport through saturated and unsaturated porous media. Analysis of
confined and unconfined aquifers. Computer solution of large-scale field
problems including groundwater contamination and aquifer yield.
Prerequisites: CE 514 with C or better

CE 520. ENGINEERING PLANNING. (4 Credits)
The application of systems analysis to structuring, analyzing, and
planning for civil engineering projects. Concept of the system and its
environment; setting goals, objectives, and standards; evaluation criteria;
solution generation and analysis; and evaluation and optimization.
Project management using precedence node diagramming; resource
allocation and leveling; time-cost trade-off; and PERT.

CE 524. CONTRACTS AND SPECIFICATIONS. (4 Credits)
Fundamentals of construction industry contracts, including technical
specifications, and issues related to time, money, warranty, insurance, and
changed conditions.

CE 525. STOCHASTIC HYDROLOGY. (3 Credits)
Introduction to fundamental concepts that are needed for stochastic
modeling of hydrologic processes in presence of nonstationarity and
uncertainty. CROSSLISTED as BEE 525/CE 525.
Prerequisites: CE 512 with C or better or BEE 512 with C or better
Equivalent to: BEE 525

CE 526. ADVANCED CONCRETE MATERIALS. (3 Credits)
Cement hydration, supplementary cementing materials, micro to macro
scale property development, mixture design and proportioning including
material selection for sustainable design practices, durability aspects
including freeze-thaw attack, corrosion of reinforcing steel, sulfate attack
and alkali-silica reaction, recent advances in concrete technology.
Recommended: CE 321 or CCE 321

CE 527. TEMPORARY CONSTRUCTION STRUCTURES. (4 Credits)
Design and construction of temporary structures including formwork,
shoring, and earth retaining structures.
Recommended: (CE 321 or CCE 321) and (FE 315 or CE 372) and
(CEM 383 or CE 383)

CE 528. PROJECT MANAGEMENT FOR CIVIL ENGINEERS. (4 Credits)
Provides the prospective civil engineer with the technical knowledge and
familiarity necessary to successfully and confidently manage projects
of different sizes and complexity levels. It relies on basic knowledge and
techniques developed by the Project Management Institute (PMI) and
real-world examples (through lectures, example projects, case studies,
and guest speakers) from the public and private sectors.

CE 529. OPTIMIZATION IN WATER RESOURCES ENGINEERING. (3 Credits)
Introduction to problem formulation and optimization techniques for
design of complex water resources systems.
Recommended: CE 512 or BEE 512

CE 530. SELECTED TOPICS IN STRUCTURAL ANALYSIS AND
MECHANICS. (3 Credits)
A critical, in-depth examination of topics selected by the instructor from
among topics not covered in other structural analysis and mechanics
courses.
Prerequisites: CE 585 with C or better
This course is repeatable for 16 credits.

CE 531. STRUCTURAL MECHANICS. (3 Credits)
Theories of failure, multi-axial stress conditions, torsion, shear
distortions, energy methods of analysis, beams on elastic foundations.
Nonlinear and inelastic behavior.
CE 532. FINITE ELEMENT ANALYSIS. (4 Credits)
Applications of the finite element method to structural analysis, fluid flow and elasticity problems. Use and development of large finite element computer programs.
Prerequisites: (CE 585 with C or better or ME 520 with C or better)

CE 533. STRUCTURAL STABILITY. (3 Credits)
Stability theory and applications, with emphasis on design of steel structures.
Recommended: CE 383

CE 534. STRUCTURAL DYNAMICS. (4 Credits)
Analytical and numerical solutions for single, multi-degree of freedom and continuous vibrating systems. Behavior of structures, dynamic forces and support motions. Seismic response spectra analysis.
Recommended: CE 382

CE 535. INTRODUCTION TO RANDOM VIBRATIONS. (4 Credits)
Introduction to probability theory and stochastic processes. Correlation and spectral density functions. Response of linear systems to random excitations. First excursion and fatigue failures. Applications in structural and mechanical system analysis and design.
Prerequisites: CE 534 with C or better or ME 522 with C or better

CE 536. MATRIX METHODS OF STRUCTURAL ANALYSIS. (4 Credits)
Equivalent to: CE 585
Recommended: CE 382 with a minimum grade of C

CE 537. NONLINEAR STRUCTURAL ANALYSIS. (4 Credits)

CE 538. STRUCTURAL RELIABILITY AND RISK ANALYSIS. (4 Credits)
Application of probability and statistics in the reliability-based analysis and design of civil and mechanical engineering systems. Probabilistic modeling of loading and resistance including load and resistance factor design. Introduction to risk analysis and robustness.
Prerequisites: (CE 536 with C or better or ME 520 with C or better)
Recommended: ST 314

CE 540. SPECIAL TOPICS IN HYDRAULIC ENGINEERING. (3-4 Credits)
Introduction to the tools and methods employed to characterize hydrologic properties of subsurface systems. Hands-on use of GPR, TDR, resistivity, and methods of determining hydraulic conductivity, sorptivity, bulk density, and other fundamental hydrologic properties.
Equivalent to: BRE 540
This course is repeatable for 16 credits.

CE 543. APPLIED HYDROLOGY. (4 Credits)
Advanced treatment of hydrology covering major components of the hydrological cycle with special emphasis on surface water; hydrologic analysis and design of water resource systems; runoff prediction; and simulation of surface water systems. Offered alternate years.
Equivalent to: BRE 543
Recommended: BEE 512 and CE 412

CE 544. OPEN CHANNEL FLOW. (3 Credits)
Steady, uniform, and nonuniform flow in natural and artificial open channels; unsteady flow; interaction of flow with river structures; and computational methods.
Equivalent to: BEE 544, BRE 544
Recommended: (CE 311 and CE 313) or CE 547

CE 547. WATER RESOURCES ENGINEERING I: PRINCIPLES OF FLUID MECHANICS. (4 Credits)
Fluid mechanics for water resources engineers, classifications of fluid flows; fluid statics and dynamics, incompressible viscous flows; dimensional analysis; applications to fluid machinery, flow through porous media, fluid motion in rivers, lakes, oceans.

CE 548. WATER QUALITY DYNAMICS. (3 Credits)
Mass balance, advection and diffusion in streams, lakes and estuaries; thermal pollution, heat balance, oxygen balance, and eutrophication; mathematical models; and numerical solutions.

CE 551. COMPUTER-AIDED SITE AND ROAD DESIGN. (4 Credits)
Site development and road design principles and application to a comprehensive design project using computer-based digital terrain model software tools. Lec/lab/rec.
Recommended: Completion or concurrent enrollment in CE 392

CE 552. ISOLATED SIGNALIZED INTERSECTIONS. (3 Credits)
Relationships between signal display, user response, vehicle detection, and signal timing parameters are examined in detail. Traffic simulation is introduced to visualize and design the various elements of isolated signalized intersections.
Recommended: CE 595

CE 553. RAILROAD ENGINEERING. (3 Credits)
The principal subject of this course is the railway infra-structure and operational issues related to high speed passenger rail and freight rail (class 1 and regional rail). The course will cover the techniques used to design, construct, monitor and maintain railway track. Class will include field trips.
Corequisites: CE 392

CE 554. DRIVING SIMULATION. (3 Credits)
Relationships between the functional elements of driving simulation (simulation computer processing, sensory feedback generation, sensory display devices, and the human operator) are examined in detail. The role of driving simulation in transportation engineering research and practice is also considered in depth. Students will design experiments, analyze and interpret data, and extrapolate simulator results to real-world scenarios.
Recommended: CE 595

CE 556. TRANSPORTATION SAFETY ANALYSIS. (3 Credits)
Provides students with a general knowledge of major transportation safety issues and a general background in the application of various statistical and econometric safety analysis techniques. In addition, this course presents a number of model-estimation methods used in transportation safety data analysis, and other subject areas that deal with safety analysis.
Recommended: CE 392 with a minimum grade of C and ST 511
CE 557. NETWORK FLOW ANALYSIS AND OPTIMIZATION. (3 Credits)
Acquaints students with the basic elements of operations research through transportation networks, optimal paths in transportation networks, vehicle routing and scheduling problems on networks, facility location problems, transportation network design problems, transportation network flows, and to indicate the directions for future research in this area. Although the course utilizes examples from transportation, the techniques and models are generalizable to other areas of engineering, e.g., water networks, computer networks, energy networks, agricultural, power, telecommunication, etc.
Recommended: CE 392 with a minimum grade of C.

CE 560. SELECTED TOPICS IN GEOMATICS ENGINEERING. (0-4 Credits)
Selected topics on contemporary problems in geomatics engineering; application of ongoing research from resident and visiting faculty. This course is repeatable for 16 credits.

CE 561. PHOTOGRAVIMETRY. (3 Credits)
Geometry of terrestrial and vertical photographs, flightline planning, stereoscopy and parallax, stereoscopic plotting instruments, analytical photogrammetry, orthophotography, introduction to photo interpretation, and aerial cameras.
Recommended: CE 361 or CEM 263 or FE 208.

CE 562. DIGITAL TERRAIN MODELING. (4 Credits)
Fundamentals of LIDAR and creating digital terrain models. Computational geometry, Delaunay triangulations, spline interpolations, statistical gridding methods, ground filtering, data optimizations, and advanced topics in 3D modeling.
Recommended: CE 361 or CEM 263 or equivalent surveying or GIS course.

CE 563. CONTROL SURVEYING. (4 Credits)
Global Positioning Systems (GPS) theory, networks, and fieldwork; control specifications, methods and problems in obtaining large area measurements; precise leveling; network adjustments using least square techniques; field instrument adjustments.
Recommended: CE 361 or CEM 263 or FE 208.

CE 564. GLOBAL NAVIGATION SATELLITE SYSTEM. (4 Credits)
Theories and applications of surveying using satellites, focusing on the use of Global Navigation Satellite System (GNSS). The course will begin with the comprehensive overviews of the GNSS, reference and time systems as well as basic orbital mechanics. A description of the satellite signals and the data collected by GNSS receivers will also be covered. Different positioning and navigation techniques for using GNSS data (absolute/relative positioning, static/kinematic positioning, stand-alone/network based positioning) and different user applications will be reviewed, followed by practices of data collections and processing techniques.
Recommended: CE 361 or CE 202.

CE 565. OREGON LAND SURVEY LAW. (3 Credits)
Introduction to U.S. public land survey; Oregon state statutes, common law decisions, and administrative rules dealing with boundary law; case studies; unwritten land transfers; original and resurvey platting laws; guarantees of title; deed descriptions.
Recommended: CE 361 or CEM 263 or FE 208.

CE 566. 3D LASER SCANNING AND IMAGING. (4 Credits)
Fundamentals of lidar acquisition, registration, processing, modeling, analysis, and verification. Use of sensor platforms for 3D acquisition. Effective data management procedures. Introduction to other imaging techniques including structure from motion and structured light. Lec/lab.

CE 567. COASTAL REMOTE SENSING. (4 Credits)
Application of remote sensing technologies (e.g., unmanned aircraft systems, multi- and hyperspectral imagery, high-resolution commercial satellite imagery, synthetic-aperture radar, and topographic and bathymetric lidar) to coastal mapping and charting, coastal engineering and coastal zone management. Both the theory and applications of advanced remote sensing technologies are covered. Lec/lab.
Recommended: An undergraduate surveying course, such as CE 361, CEM 263 or FE 208 and some exposure to MATLAB.

CE 568. LEAST SQUARES ADJUSTMENTS. (3 Credits)
Examines the theory of random error and statistical testing. Discusses the propagation of error in both indirect observations and direct observations from survey. Studies weights of observations and the principles of least squares. Explains how to adjust redundant observations in level nets, horizontal surveys, GNSS networks, and GNSS and terrestrial survey networks by least squares. Estimates the error ellipses of the adjusted observations. Evaluates methods for performing coordinate transformations.
Recommended: CE 361 or CEM 263 or FE 208.

CE 569. PROPERTY SURVEYS. (3 Credits)
U.S. public land survey: restoration of corners, subdivision of sections; topographic mapping; subdivision and partition plats, resurvey plats, subdivision design; introduction to LIS/GIS; field astronomy.
Recommended: CE 361 and CEM 263 or FE 208.

CE 570. GEOTECHNICAL SPECIAL TOPICS. (1-16 Credits)
Development and management of actual projects through the examination of case histories; evaluation of geotechnical data; development of design recommendations and preparation of project reports. This course is repeatable for 16 credits.

CE 571. ADVANCED FOUNDATION ENGINEERING. (4 Credits)
Presents the planning, analysis, and design of shallow and deep foundations from the geotechnical engineering perspective. Topics supporting course objectives include planning and execution of subsurface investigations, interpretation of in-situ tests, analysis and design of deep and shallow foundations, including geotechnical capacity, and immediate settlement. Assessment of deep foundation installation, axial and lateral loading tests, and group effects is presented. Evaluation of foundation performance is conducted under deterministic and probabilistic frameworks.
Recommended: CE 373 and CE 471.

CE 572. ADVANCED GEOTECHNICAL LABORATORY. (4 Credits)
Examination of soil composition and engineering properties of soils including volume change, pore pressure generation, strength, and deformation behavior of soils in the laboratory. Advanced static and cyclic shear strength testing of soils will also be discussed. Lec/lab.
Recommended: CE 373 and CE 471.

CE 574. ENGINEERING PROPERTIES OF SOILS. (5 Credits)
Advanced laboratory experimental methods for measurement of soil properties. Analysis of experimental data, and methods to display data for 2D and 3D experiments. Compositional and environmental factors affecting the stress-strain, volume change, compressibility, shear strength behavior of sand, clay, and compacted soils in 2D and 3D. Stress and strain invariants and modeling of failure criteria.
Recommended: CE 471.
CE 575. EARTH RETENTION AND SUPPORT. (4 Credits)  
Presented the theory and practice of design and construction of earth retaining structures. Topics include rigid and flexible retaining structures, ranging from gravity and cantilever systems, cantilever and anchored sheet piling, tied-back shoring elements, soil nailing, and mechanically stabilized earth walls. These topics are developed with a view on compaction stresses and surface loading, and invokes approaches that range from the static equations of equilibrium to empirical rules of thumb.  
Recommended: CE 372

CE 576. GROUND IMPROVEMENT. (3 Credits)  
Presented the analysis and design of ground improvement techniques. Topics supporting course objectives include design for accelerated settlement (surcharge design) with and without pre-fabricated vertical drains, vibro-compaction, vibro-replacement (stone columns) and aggregate piers; deep soil mixing; jet grouting; EPS geofoam; and other improvement techniques for improving soil strength and stability, and limiting deformations and the effects of liquefaction.  
Prerequisites: CE 572 with C or better and CE 577

CE 577. STATIC AND DYNAMIC SOIL BEHAVIOR. (3 Credits)  
An advanced coverage of volume change and strength behavior of soil. Specific course topics include effective stress, one-dimensional compression of soil, rate of soil consolidation, Mohr circle analysis, shear strength of sands, clays, and silts, and dynamic soil properties, strength, and testing.  
Recommended: CE 372 and CE 373

CE 578. GEOTECHNICAL EARTHQUAKE ENGINEERING. (4 Credits)  
Major course topics include engineering seismology, strong ground motion, seismic hazard analysis, soil dynamics, seismic site response, earthquake motion selection, liquefaction, and seismic slope stability. Attention will be given to earthquakes created by the Cascadia Subduction Zone. Lec/lab.  
Recommended: CE 373 and CE 471

CE 579. SLOPE AND EMBANKMENT DESIGN. (3 Credits)  
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSTLISTED as CE 479/FE 479 and CE 579/FE 579.  
Equivalent to: FE 579  
Recommended: CE 373 or FE 316

CE 580. SELECTED TOPICS IN STRUCTURAL DESIGN. (3 Credits)  
A critical examination in depth of topics selected by the instructor from among topics not covered in other structural design courses. This course is repeatable for 18 credits.

CE 581. REINFORCED CONCRETE I. (4 Credits)  
Basic principles of reinforced concrete design; strength, stability, and serviceability criteria; design of reinforced concrete members for flexure and shear. Detailing, development length and splices.  
Recommended: CE 382

CE 582. MASONRY DESIGN. (3 Credits)  
A critical examination in depth of masonry design topics.  
Recommended: CE 581

CE 583. BRIDGE DESIGN. (3 Credits)  
AASHTO specifications for bridge design; load models; design for moving loads; design and analysis of bridge decks and simple and continuous bridge spans.  
Recommended: Completion of CE 381 and CE 382 and (CE 481 or CE 581) and concurrent enrollment in CE 383

CE 584. WOOD DESIGN. (4 Credits)  
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab. CROSSTLISTED as CE 584/WSE 558  
Equivalent to: WSE 558  
Recommended: CE 383 or CE 481 with a minimum grade of C

CE 586. PRESTRESSED CONCRETE. (3 Credits)  
Prestressed concrete analysis and design, systems of prestressing, materials, economics.  
Recommended: CE 581

CE 589. SEISMIC DESIGN. (4 Credits)  
Design of structures to resist the effects of earthquakes. Introduction to structural dynamics, dynamic analysis, seismic design philosophy, code requirements, and detailing for steel and reinforced concrete.  
Recommended: CE 383 or CE 481

CE 590. SELECTED TOPICS IN TRANSPORTATION ENGINEERING. (1-3 Credits)  
Selected topics on contemporary problems in transportation engineering; application of ongoing research from resident and visiting faculty. This course is repeatable for 9 credits.

CE 591. TRANSPORTATION SYSTEMS ANALYSIS, PLANNING, AND POLICY. (3 Credits)  

CE 592. PAVEMENT STRUCTURES. (3 Credits)  
Design and rehabilitation of pavement structures for streets, highways, and airports.  
Recommended: CE 392

CE 593. TRAFFIC FLOW ANALYSIS AND CONTROL. (4 Credits)  
Traffic operations and control systems; traffic flow theory and stream characteristics; capacity analysis; traffic models and simulation; accident and safety improvement. Offered alternate years.

CE 594. TRANSPORT FACILITY DESIGN. (4 Credits)  
Location and design of highways, and other surface transportation terminals; design for safety, energy efficiency, and environmental quality. Offered alternate years. Lec/rec.  
Recommended: CE 392

CE 595. TRAFFIC OPERATIONS AND DESIGN. (3 Credits)  
Traffic operations and engineering; human and vehicular characteristics; traffic stream characteristics; highway capacity analysis; intersection operation, control and design.  
Recommended: Completion or concurrent enrollment in CE 491

CE 596. PAVEMENT EVALUATION AND MANAGEMENT. (3 Credits)  
Advanced topics in pavement evaluation techniques and pavement management procedures.  
Recommended: CE 492
CE 597. PUBLIC TRANSPORTATION. (3 Credits)
Characteristics and nature of public transportation systems, including bus, light and heavy rail; financing policy considerations; planning transit service; managing and operating transit systems for small and large urban areas. Offered alternate years.

CE 598. AIRPORT PLANNING AND DESIGN. (3 Credits)
Characteristics and nature of the air transport system. Airport financing, air traffic control. Analysis and design of airports and the airport planning processes. Airport appurtenances. Airport pavement design, environmental facilities and drainage. Offered alternate years.

CE 599. INTELLIGENT TRANSPORTATION SYSTEMS. (3 Credits)
Introduction to intelligent transportation systems, including enabling surveillance, navigation, communication and computer technologies. Application of technologies for monitoring, analysis evaluation and prediction of transportation system performance. Intervention strategies, costs and benefits, safety, human factors, institutional issues and case studies. Offered alternate years.

Recommended: CE 491 for new graduate students

CE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CE 607. OCEAN ENGINEERING SEMINAR. (1 Credit)
Presentations from on-campus and off-campus speakers discussing state of technology topics in ocean engineering research, development, and construction. Graded P/N.

This course is repeatable for 16 credits.

CE 630. OCEAN WAVE MECHANICS I. (3 Credits)
Linear wave boundary value problem formulation and solution, water particle kinematics, shoaling, refraction, diffraction, and reflection. Linear long wave theory with applications to tides, seiching, and storm surge. CROSSLISTED as CE 630/OC 630.

Equivalent to: OC 630

CE 631. OCEAN WAVE MECHANICS II. (3 Credits)
Second in the sequence of ocean wave engineering mechanics, covers the following topics: introduction to long wave theory, wave superposition, wave height distribution, and the wind-wave spectrum, introduction to wave forces, and basic nonlinear properties of water waves. May include additional selected topic in wave mechanics.

CROSSLISTED as CE 631/OC 631.

Prerequisites: (CE 630 with C or better or OC 630 with C or better)

Equivalent to: OC 631

CE 634. LONG WAVE MECHANICS. (3 Credits)
Theory of long waves. Depth-integrated Euler’s equation and its jump conditions. Evolution equations and their solutions. Nonlinear shallow-water waves, the Korteweg-deVries equation and Boussinesq equation. Boundary-layer effects. Shallow-water waves on beaches. Applications of the fundamentals to problems of tsunamis. CROSSLISTED as CE 634/OC 634.

Prerequisites: (CE 630 with C or better and CE 631 [C])

Equivalent to: OC 634

Recommended: OC 670

CE 635. APPLIED MODELING OF NEARSHORE PROCESSES. (4 Credits)
An introduction to numerical modeling of the nearshore ocean, providing hands-on experience with state-of-the-art numerical models for wave propagation, nearshore circulation, planform shoreline evolution and bathymetric profile evolution. The focus is on review of model requirements, detailed study of several specific models for several domains of interest, application to coastal phenomena, and the interpretation of model results. Offered alternate years.

CROSSLISTED as CE 635/OC 635.

Equivalent to: OC 635

CE 639. DYNAMICS OF OCEAN STRUCTURES. (3 Credits)
Dynamic response of fixed and compliant structures to wind, wave and current loading; Morison equation and diffraction theory for wave and current load modeling, time and frequency domain solution methods; application of spectral and time series analyses; system parameter identification; and stochastic analysis of fatigue and response to extreme loads. Offered alternate years.

CE 640. SELECTED TOPICS IN OCEAN AND COASTAL ENGINEERING. (1-3 Credits)
Selected topics on contemporary problems in ocean and coastal engineering; application of ongoing research from resident and visiting faculty. Offered alternate years.

This course is repeatable for 9 credits.

Recommended: CE 630

CE 642. RANDOM WAVE MECHANICS. (3 Credits)
Random wave theories, probability and statistics of random waves and wave forces, time series analyses of stochastic processes, ocean wave spectra. Offered alternate years.

Prerequisites: CE 630 with C or better

CE 643. COASTAL ENGINEERING. (3 Credits)
Coastal sediment transport including nearshore currents, longshore onshore-offshore transport, and shoreline configuration; equilibrium beach profile concept with application to shore protection; shoreline modeling; tidal inlet hydrodynamics and inlet stabilization; design criteria for soft structures. Offered alternate years.

Prerequisites: CE 630 with C or better

CE 645. WAVE FORCES ON STRUCTURES. (3 Credits)
Wave forces on small and large members, dimensional analyses and scaling of equations, identification and selection of force coefficients for Morison equation; compatibility of wave kinematics and force coefficients in Morison equation, diffraction and radiation of surface gravity waves by large floating bodies, wavemaker problem, and reciprocity relations.

Prerequisites: CE 630 with C or better

CE 647. OCEAN AND COASTAL ENGINEERING MEASUREMENTS. (3 Credits)
Hands-on experience in the conduct of field and laboratory observations, including waves, currents, wind, tides, tsunami, sediments, bathymetry, shore profiles, wave forces on structures, and structural response. Online data archival and retrieval systems.

Prerequisites: CE 630 with C or better
CE 661. KINEMATIC POSITIONING AND NAVIGATION. (3 Credits)
Application of Global Navigation Satellite System (GNSS) aided Inertial Navigation Systems (INS) to directly georeference survey data acquired from a moving platform, such as an unmanned aircraft system (UAS), conventional aircraft, survey boat, or all-terrain vehicle. Topics include 3D coordinate transformations, dead-reckoning, inertial navigation, kinematic GNSS, Kalman filtering, and sensor modeling.
Recommended: Undergraduate surveying course, such as CE 361, CE 263 or FE 208, and some exposure to MATLAB

CE 663. GEODESY. (4 Credits)
Covers the geometrical aspects of terrestrial and celestial reference systems as well as modern realizations of these coordinate systems. In addition, an introductory level of the physical geodesy is also included, such as gravitational and gravity fields in order to deal with the geoid and heights. From this course, students are expected to understand the core elements of geometric and physical earth, which will assist them to have a solid background for other geospatial related studies.
Recommended: CE 202 or CE 361

CE 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

College Student Services Admin (CSSA)

CSSA 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AHE 501, ED 501
This course is repeatable for 16 credits.

CSSA 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 502
This course is repeatable for 16 credits.

CSSA 503. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 503
This course is repeatable for 999 credits.

CSSA 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 505
This course is repeatable for 16 credits.

CSSA 506. PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: AHE 506
This course is repeatable for 16 credits.

CSSA 507. SEMINAR. (1-5 Credits)
Graded P/N.
Equivalent to: AHE 507
This course is repeatable for 16 credits.

CSSA 508. WORKSHOP. (1-3 Credits)
Graded P/N.
Equivalent to: AHE 508
This course is repeatable for 16 credits.

CSSA 510. INTERNSHIP. (1-18 Credits)
Graded P/N.
Equivalent to: ED 510
This course is repeatable for 18 credits.

CSSA 513. RESEARCH IN HIGHER EDUCATION. (3 Credits)
Basic understanding of research and assessment ideas, uses, and practices in higher education and student affairs.
Equivalent to: AHE 513

CSSA 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student’s research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSLISTED as ANTH 515/ CSSA 515/ES 515/WGSS 515.
Equivalent to: ANTH 515, ES 515, WGSS 515

CSSA 520. MULTICULTURAL ISSUES IN HIGHER EDUCATION. (3 Credits)
Developing understanding, knowledge, and skills of multiculturalism affecting the student affairs profession and careers in student affairs administration.
Equivalent to: AHE 520

CSSA 530. FUNDAMENTALS OF COUNSELING. (3 Credits)
Explores basic helping skills and processes appropriate in a variety of settings, specifically within the higher education arena. Instruction will focus on a variety of counseling skills and techniques through videotape and role plays. Course activities will explore ethical standards of conduct, multicultural considerations and competencies, and engage in discussions of counseling issues within higher education.
Equivalent to: COUN 530

CSSA 535. TRAGEDY AND CRISIS MANAGEMENT IN HIGHER EDUCATION. (3 Credits)
Introduction to the history of major incidents of college and university tragedies and best practices for preventing and responding to these crisis situations.

CSSA 548. AMERICAN HIGHER EDUCATION. (3 Credits)
The origins and development of higher education in the United States from the colonial colleges to the present.
Equivalent to: AHE 548

CSSA 549. GLOBALIZATION IN HIGHER EDUCATION. (3 Credits)
Exposes students to the multifaceted nature of global education by exploring Globalization/internationalization as it relates not only to student affairs, but to the greater higher education setting.

CSSA 551. PROGRAMS AND FUNCTIONS IN COLLEGE STUDENT SERVICES. (3 Credits)
Historical, philosophical, and organizational foundations; operational components and functional areas; overview and analysis of college student services in postsecondary educational institutions; leadership development.
Equivalent to: AHE 551
CSSA 552. STUDENT DEVELOPMENT IN UNIVERSITIES AND COLLEGES. (3 Credits)
Theoretical and philosophical foundations of student development; analysis of college student characteristics and the student culture; nontraditional student subgroups; student attitudes, values, and beliefs; concepts and models that promote student learning; and assessment of student growth.
Equivalent to: AHE 552
This course is repeatable for 6 credits.

CSSA 553. STUDENT DEVELOPMENT IN UNIVERSITIES AND COLLEGES II. (3 Credits)
Gain a deeper understanding of adult student populations and development theory (specifically, cognitive theories and typologies) and its application to practice.

CSSA 554. LEGAL ISSUES IN HIGHER EDUCATION. (3 Credits)
A comprehensive presentation and discussion of the law governing administration within public colleges and universities with a special emphasis on tort liability and freedom of expression.
Equivalent to: AHE 554

CSSA 555. PROFESSIONAL DEVELOPMENT IN COLLEGE STUDENT SERVICES. (1 Credit)
Self-assessment, goal setting, professional growth, and professional ethics as a practitioner in college student services administration. Graded P/N.
Equivalent to: AHE 557

CSSA 558. ORGANIZATION AND ADMINISTRATION OF COLLEGE STUDENT SERVICES. (3 Credits)
Legal foundations, governance models, planning, and goal setting, resource acquisition and allocation, personnel and financial management and administrative leadership.
Equivalent to: AHE 558

CSSA 559. CSSA TRANSITIONS. (3 Credits)
First-term CSSA students will explore issues of professional transition, orientation and acculturation, including: foundational professional values that inform student affairs work; student affairs professional associations; student affairs research and scholarship; social justice in higher education; and approaches to self-care and professional well-being.

CSSA 574. BUDGET AND FINANCE. (2 Credits)
Introduction to budget and finance in student services. Overview of topics with which student affairs practitioners should be familiar, able to use, and assess.
Equivalent to: AHE 574

CSSA 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Communication (COMM)

COMM 111. *PUBLIC SPEAKING. (3 Credits)
Public communication as it relates to informative and persuasive discourse. The theory and practice of public speaking in informative and persuasive contexts. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech
Equivalent to: COMM 111H

COMM 114. *ARGUMENT AND CRITICAL DISCOURSE. (3 Credits)
Examination of argumentation as a part of human interaction and investigation. The course emphasizes the processes by which people give reasons to gain adherence and to justify beliefs and actions. The course includes readings, writing, and presentations concerned with the nature of arguments, processes of arguing, and argument criticism. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech
Equivalent to: COMM 114H

COMM 114H. *ARGUMENT AND CRITICAL DISCOURSE. (3 Credits)
Examination of argumentation as a part of human interaction and investigation. The course emphasizes the processes by which people give reasons to gain adherence and to justify beliefs and actions. The course includes readings, writing, and presentations concerned with the nature of arguments, processes of arguing, and argument criticism. Lec/rec. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech
Equivalent to: COMM 114

COMM 180. INTRODUCTION TO THE RHETORIC OF THE FILM. (3 Credits)
The motion picture from prephotographic eras to the present; individuals responsible for major advances in theory and technique. The motion picture and social influence. Films viewed for discussion and analysis. Film fee required.

COMM 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 211. *COMMUNICATING ONLINE. (3 Credits)
In our increasingly technological world, we use mediated communication to build relationships. Introduces students to the theoretical and practical dimensions on online communication in order to facilitate more informed analysis and performance of online communication as a means of developing both interpersonal and public relationships. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech

COMM 218. *INTERPERSONAL COMMUNICATION. (3 Credits)
Introduction to dyadic and relational communication. Overview of current research in such areas as verbal and nonverbal messages, self-concept and perception, culture and gender stereotypes and styles, relational development and dissolution, deception, compliance gaining and conflict management. (Bacc Core Course)
Attributes: CSW3 – Core, Skills, Speech

COMM 221. FORENSICS. (3 Credits)
Laboratory experience in debate, public speaking, and interpretation of literature. Preparation for intercollegiate debate and forensics participation.
COMM 280. MEDIA COMMUNICATION IN THE INFORMATION AGE. (3 Credits)
A survey of the traditional media of mass communication and the
new and emerging media technologies: their development, role in
contemporary society and impact upon the public. The influence of
mediated communication upon living in the information society. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 312. ADVANCED PUBLIC SPEAKING. (3 Credits)
Advanced theory and practice in public speaking. Simulated public
speaking situations, audience analysis, and rhetorical strategies will
be emphasized. Students will prepare and present a variety of public
speeches.
Prerequisites: COMM 111 with D- or better or COMM 111H with D- or
better or COMM 114 with D- or better or COMM 114H with D- or
better

COMM 314. ARGUMENTATION. (3 Credits)
Concepts and processes of argumentation, systems of logic, critical
analysis of contemporary efforts to influence. Examination of arguing to
gain adherence and argumentation as a way of knowing. Development of
cases and argument briefs for presentation. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 114 with D- or better or COMM 114H with D- or
better

COMM 316. ADVANCED PERSUASION. (3 Credits)
Advanced theory and practice in persuasion, with evidence on social
and behavioral science research. Examination of the cognitive and
affective aspects of persuasion, focusing particularly on the audience.
Consideration of persuasion in interpersonal relations, organizations,
with insights into past familial experiences and skills for future family
relationships.
Prerequisites: COMM 218 with D or better

COMM 318. ADVANCED INTERPERSONAL COMMUNICATION. (3 Credits)
Advanced theory and practice in communication in interpersonal
relationships. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: COMM 218 with D- or better or COMM 218H with D- or
better

COMM 320. INTRODUCTION TO RHETORICAL THEORY. (3 Credits)
Introduction to the basic theories of rhetoric, as well as the background
of rhetoric as a discipline in speech communication. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 321. INTRODUCTION TO COMMUNICATION THEORY. (3 Credits)
Introduction to 20th century models, theories, and empirical research
programs in communication. Survey of selected theories and social
scientific methods across diverse contexts in communication. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 322. SMALL-GROUP PROBLEM SOLVING. (3 Credits)
Theory and practice of small-group decision making. Group processes of
problem solving and decision by consensus. The history and role of group
problem solving in a democratic society. Group power, leadership, and
roles. Experience with problems of fact, value, and policy. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 218

COMM 323. COMMUNITY DIALOGUE. (4 Credits)
Examination of the nature and role of community dialogue in formal
and informal social scenes in which participants communicate differing
perspectives, values and beliefs. Taught at OSU-Cascades only.

COMM 324. COMMUNICATION IN ORGANIZATIONS. (3 Credits)
Examination of the nature and role of communication in formal and
informal organizations. Introductory survey of central issues in the
study of organizations, including corporate communication, leadership,
organizational effectiveness, power, organizational culture, management
styles, organizational conflict, and decision making. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 325. COMMUNICATING LEADERSHIP. (4 Credits)
Theory and practice of communicating leadership. Communication
processes of facilitating productive climates, innovative and creative
leading, and goal-oriented community leading. Offered at OSU-Cascades
only.

COMM 326. INTERCULTURAL COMMUNICATION. (3 Credits)
Perspectives, theories, and experiences of communication in intercultural,
cross-cultural, and pan-cultural relations. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 328. NONVERBAL COMMUNICATION. (3 Credits)
The study of human communication behavior that transcends the spoken
and written word; nondiscursive symbolism. The course examines the
relationship between nonverbal and verbal communication behavior and
nonverbal communication skill development. Topics addressed include
space, distance, the environment, touch, gesture, facial expression, and
gaze as communication. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 332. FAMILY COMMUNICATION. (3 Credits)
How various elements of communication impact familial relationships.
Two main discussions: general communication patterns in the family, and
various understudied types of family relationships. Provides students
with insights into past familial experiences and skills for future family
relationships.
Prerequisites: COMM 218 with D or better

COMM 350. DEBATE AND FORENSICS WORKSHOP. (1-3 Credits)
Laboratory experience in debate, public speaking, and interpretation
of literature. Preparation for intercollegiate debate and forensics
participation.
This course is repeatable for 15 credits.

COMM 358. PROPAGANDA AND SOCIAL CONTROL. (3 Credits)
Case studies, examples, and analyses of direct and indirect influences
upon thought, belief, and action involving mass media of communication,
including film, theatre, radio, television, posters, and art objects. Historical
approach using film, tape, and recordings for student analysis and
discussion. (SS)
Attributes: LACS – Liberal Arts Social Core

COMM 372. VISUAL RHETORIC. (3 Credits)
The course will survey the major theories of semiotics. Using semiotics
as a foundation, students will explore the nature of the rhetoric of the
visual image. (H)
Attributes: LACH – Liberal Arts Humanities Core

COMM 380. IMAGE AND MYTH IN FILM. (3 Credits)
Film as a medium for creating, reflecting, and defining values, roles,
stories, conflicts, problems, strategies, expectations, and institutions in
American life. Various methods of analysis and evaluation are applied
to film as an agent and artifact. Film images of the frontier, war, women,
men, justice, America, progress, and beauty are explored. Film fee
required. (H)
Attributes: LACH – Liberal Arts Humanities Core
COMM 302. TELEMEDIA DESIGN AND PRODUCTION. (4 Credits)
Study and practice of communication through telemedia (video, audio, computer), and emphasis on the principles of telemedia authorship. The study includes telemedia distribution systems and effects on audiences. Lec/lab.

COMM 385. COMMUNICATION AND CULTURE IN CYBERSPACE. (3 Credits)
Covers history and culture of the Internet, as well as social, political, and economic issues of computer-mediated communication. Currently, scholars are seeing a shift in how individuals self-report building close relationships, as people use elements of new media more and more frequently. Designed to look into the similarities and differences of these relationships as compared to face-to-face relationships. CROSSLISTED as COMM 388/NMC 388.

Equivalent to: NMC 388

COMM 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 410. COMMUNICATION INTERNSHIP. (1-16 Credits)
An assignment in a private or public business or agency. The student observes or works in one or more departments of the enterprise, perhaps in one area of interest or specialization (e.g., public relations, training, personnel, research and planning). Work is supervised by the agency staff, supervising school faculty members(s) provide academic evaluation. 12 credits maximum. This course is repeatable for 12 credits.

Recommended: Minimum of 21 credits

COMM 412. TOPICS IN SPEECH COMMUNICATION. (3 Credits)
Contemporary issues in speech communication: appraisal and discussion of current theories, trends, research methods, problems, or applications. This course is repeatable for 9 credits.

Recommended: 9 credits of speech communication.

COMM 414. COMMUNICATION RESEARCH METHODS. (3 Credits)
Communication research and its relationship to theory. Quantitative and qualitative methods of investigation in speech communication. Experimental and non-experimental research design; naturalistic observation; issues of reliability and validity; statistical analysis. Standards and principles of writing and reporting research.

Prerequisites: COMM 321 with D- or better

COMM 416. ETHNOGRAPHY OF COMMUNICATION. (3 Credits)
Study and practice of using ethnography of communication as a research method for developing theory in communication studies; topics include data collection, analysis, and writing ethnographic reports. (SS)

Attributes: LACS – Liberal Arts Social Core

Prerequisites: COMM 321 with D- or better

COMM 418. *INTERPERSONAL COMMUNICATION THEORY AND RESEARCH. (3 Credits)
Current theory, research, and practice in interpersonal communication. Issues addressed may include compliance gaining, nonverbal behavior, family communication, gender issues, impression formation, rules, and human relations. (SS) (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC; LACS – Liberal Arts Social Core

Prerequisites: COMM 321 with D- or better

COMM 422. *SMALL-GROUP COMMUNICATION THEORY AND RESEARCH. (3 Credits)
Current theory, research, and practice in communication and small-group communication. Issues addressed may include leadership, decision making, problem solving, training, and human relations. (SS) (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC; LACS – Liberal Arts Social Core

Prerequisites: COMM 321 with D- or better

COMM 425. COMMUNICATION AND YOUTH OUTREACH. (4 Credits)
Examines the role of communication outreach when working with youth. Study and examination of applied youth communication theory and research. Topics may include establishing communication boundaries, communicating identity, anti-smoking and anti-drug campaigns, social exclusion, effects of media, and pro-social communication. Students are required to volunteer in a youth context coordinated by the instructor. Taught only on the OSU-Cascades Campus.

COMM 426. INTERCULTURAL COMMUNICATION: THEORIES AND ISSUES. (3 Credits)
Advanced study in intercultural communication theoretical developments and research directions. Topics addressed may include intercultural research methods, training, language and culture, acculturation, and intercultural effectiveness. (SS)

Attributes: LACS – Liberal Arts Social Core

Prerequisites: COMM 321 with D- or better and COMM 326 [D-]

COMM 427. CULTURAL CODES IN COMMUNICATION. (3 Credits)
Study and examination of the contextualized use of communication within speech communities and cultures; topics include the cultural patterning of communication and cultural communication theory.

COMM 430. THEORETICAL ISSUES IN COMMUNICATION INQUIRY. (3 Credits)
Review of conceptual, philosophical, ontological, epistemological, and methodological issues in the development of theories in human communication; application to contemporary, empirical human communication research. (SS)

Attributes: LACS – Liberal Arts Social Core

Prerequisites: COMM 321 with D- or better

COMM 432. GENDER AND COMMUNICATION. (3 Credits)
Investigation of impact of sex and gender on communication in conflict, decision-making, leadership, nonverbal messages, language, and interpersonal relationships. Focus on definitions of sex and gender in regard to knowledge, social constructs, and self-development.

Prerequisites: COMM 321 with D- or better

Equivalent to: COMM 432H
COMM 435. SCIENTIFIC, TECHNICAL, & PROFESSIONAL COMMUNICATION CAPSTONE. (1 Credit)
Complete a portfolio comprised of material generated throughout previous courses in the Certificate in Scientific, Technical, and Professional Communication. CROSSLISTED as COMM 435/WR 435.
Equivalent to: WR 435
Recommended: Completion of 18 credits towards the Scientific, Technical, and Professional Communication Certificate

COMM 437. HEALTH COMMUNICATION. (3 Credits)
This class is designed to unpack various elements of how communication impacts health, and vice versa. There are three main sections to this course: 1) discussing doctor-patient communication, 2) discussing the effects of health campaigns, and 3) discussing the link between communication and both psychological and physiological health.

COMM 440. THEORIES OF CONFLICT AND CONFLICT MANAGEMENT. (3 Credits)
Conflict on a variety of levels: intrapersonal, interpersonal, group, public, and social. Conflict in a variety of contexts: relationships, family, organizations, community, and society. Constructive and destructive means of confronting and managing conflict; social and psychological aspects of conflict; conflict analysis; causes of conflict; conflict and peace, social order, and social change; case studies of conflict. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 321

COMM 442. BARGAINING AND NEGOTIATION PROCESSES. (3 Credits)
Theory and practice of bargaining and negotiation as means of settling disputes, with emphasis on the role of communication. Strategies and tactics of distributive and integrative bargaining orientations. Negotiation preparation and experience through case studies and simulations. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 321

COMM 444. THIRD PARTIES IN DISPUTE RESOLUTION: MEDIATION AND ARBITRATION. (3 Credits)
Philosophies, strategies, practices, and characteristics of mediation and arbitration processes in the settlement of conflicts and disputes. Study of the role of the third party neutral in the peace making process. Case studies and simulations in mediation and arbitration. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 321

COMM 446. *COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES. (3 Credits)
Examination of the nature of international conflicts and disputes and the roles culture and communication play in resolving them constructively. Analysis of negotiation, mediation, and international law as approaches to dealing with international political, economic, cultural, and religious disputes. Scrutiny of contemporary world conflicts. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Recommended: COMM 321

COMM 454. ADVANCED ARGUMENTATION. (3 Credits)
Advanced study in classical and current theories of the persuasive and epistemological functions of argumentation. Examination of the dominant contemporary theorists, including Toulmin, Perelman, and Willard. Analysis of research and applied perspectives, including conversational argument, argument fields, the philosophy of argument, argument as rhetoric, and argument in contexts. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 456. *RHETORIC: 500 BC TO 500 AD. (3 Credits)
History and philosophy of rhetorical principles. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 458. *RHETORIC: 500 AD TO 1900. (3 Credits)
History and philosophy of rhetorical principles. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 460. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1750 TO 1900. (3 Credits)
Speech criticism; great American speakers, relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 462. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1900-PRESENT. (3 Credits)
Speech criticism; great American speakers, relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 464. RHETORICAL CRITICISM. (3 Credits)
Explores the approaches to the criticism of rhetoric, including aesthetic, social movement, genre, feminist, and other modes of criticism.
Prerequisites: COMM 320 with D- or better

COMM 466. ETHICS OF RHETORIC. (3 Credits)
Examines the ethical questions raised by the use of persuasive discourse, including the derivation of standards of ethical persuasion and approaches to ethical judgment about persuasion. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: COMM 320 with D- or better

COMM 470. HISTORY OF SPEECH COMMUNICATION. (3 Credits)
Examines the theories and practices involved in the development of speech communication as a field and a discipline, with a special emphasis on the central roles played by rhetorical theory and criticism.
Prerequisites: COMM 320 with D- or better and COMM 321 [D-]

COMM 472. THE RHETORIC OF POPULAR CULTURE. (3 Credits)
A survey of theories of popular culture from Arnold to Hall. Students will examine various artifacts of popular culture and the influences they exert. (H)
Attributes: LACH – Liberal Arts Humanities Core
COMM 476. ISSUES IN THE FREEDOM OF SPEECH. (3 Credits)
Examination of the theories of free expression and case materials related
to tests of free speech in key U.S. Supreme Court cases. The course
emphasizes the context of social and political movements from which the
cases arise. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: COMM 320

COMM 478. POLITICAL CAMPAIGN RHETORIC. (3 Credits)
Theory, research and methods of political campaign rhetoric. Topics
include rhetorical strategies and tactics in advertising, national
conventions, broadcast debates, media coverage and public opinion
polls. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: COMM 320

COMM 482. THE MEDIA IN CULTURE AND SOCIETY. (3 Credits)
The study of the societal-cultural impact on the media, and their
effect upon individuals, social, cultural, political, economic, and leisure
structures and systems. Special focus on the issues of media in shaping
values, molding opinions, and reflecting/projecting attitudes, beliefs, and
behaviors, including media’s role in racial, gender, and familial relations. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 280

COMM 484. MEDIA CRITICISM. (3 Credits)
A critical examination of the media analysis of content, forms and
deployment of media messages and products. A critical study of the
structure, functions and economics of media systems. A consideration
of media ethics and responsibilities in relation to news and information,
tainment, advertising and marketing, and social-cultural influence. (SS)
Attributes: LACS – Liberal Arts Social Core
Recommended: COMM 280

COMM 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

COMM 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 510. COMMUNICATION INTERNSHIP. (1-12 Credits)
An assignment in a private or public business or agency. The student
observes or works in one or more departments of the enterprise, perhaps
in one area of interest or specialization (e.g., public relations, training,
personnel, research and planning). Work is supervised by the agency
staff, supervising school faculty member(s) provide academic evaluation.
12 credits maximum. Graded P/N.
This course is repeatable for 12 credits.

COMM 512. TOPICS IN SPEECH COMMUNICATION. (3 Credits)
Contemporary issues in speech communication: appraisal and
discussion of current theories, trends, research methods, problems, or
applications.
This course is repeatable for 9 credits.
Recommended: 9 credits of speech communication.

COMM 514. COMMUNICATION RESEARCH METHODS. (3 Credits)
Communication research and its relationship to theory. Quantitative
and qualitative methods of investigation in speech communication.
Experimental and non-experimental research design; naturalistic
observation; issues of reliability and validity; statistical analysis.
Standards and principles of writing and reporting research.
Recommended: COMM 321

COMM 516. ETHNOGRAPHY OF COMMUNICATION. (3 Credits)
Study and practice of using ethnography of communication as a research
method for developing theory in communication studies; topics include
data collection, analysis, and writing ethnographic reports.
Recommended: COMM 321

COMM 517. RESEARCH METHODS IN COMMUNICATION. (3 Credits)
Introduction to the structure, process, and logic of quantitative
empirical research in communication. Topics include research design,
measurement, methodology, and descriptive statistics. Think of this as
a skills course, where you are going to learn how to understand, critique,
and design quantitative methodological approaches. Note that this
course is rigorous, and will hopefully challenge you to better understand
how research applies to your life outside of the classroom.

COMM 518. INTERPERSONAL COMMUNICATION THEORY AND
RESEARCH. (3 Credits)
Current theory, research, and practice in interpersonal communication.
Issues addressed may include compliance gaining, nonverbal behavior,
family communication, gender issues, impression formation, rules, and
human relations.
Recommended: COMM 321

COMM 520. INTRODUCTION TO GRADUATE STUDY IN SPEECH
COMMUNICATION. (3 Credits)
Introductory graduate seminar in the field of communication. Emphasis
on the breadth and depth of the discipline, graduate study, and research
directions.

COMM 522. SMALL-GROUP COMMUNICATION THEORY AND
RESEARCH. (3 Credits)
Current theory, research, and practice in communication and small-group
communication. Issues addressed may include leadership, decision
making, problem solving, training, and human relations.
Recommended: COMM 321

COMM 524. COMMUNICATION IN ORGANIZATIONS: THEORIES AND
ISSUES. (3 Credits)
Analysis of human interaction within the informal and formal systems of
organizations. Theory, research, and practice relevant to the analysis of
the nature and role of communication within small, mid-range and highly
complex organizations. The course addresses structural, functional, and
cultural features of communication in organizational environments.

COMM 526. INTERCULTURAL COMMUNICATION: THEORIES AND
ISSUES. (3 Credits)
Advanced study in intercultural communication theoretical developments
and research directions. Topics addressed may include intercultural
research methods, training, language and culture, acculturation, and
intercultural effectiveness.
Recommended: COMM 321 and COMM 326
COMM 527. CULTURAL CODES IN COMMUNICATION. (3 Credits)
Study and examination of the contextualized use of communication within speech communities and cultures; topics include the cultural patterning of communication and cultural communication theory.

COMM 530. THEORETICAL ISSUES IN COMMUNICATION INQUIRY. (3 Credits)
Review of conceptual, philosophical, ontological, epistemological, and methodological issues in the development of theories in human communication; application to contemporary, empirical human communication research.
Recommended: COMM 321

COMM 532. GENDER AND COMMUNICATION. (3 Credits)
Investigation of impact of sex and gender on communication in conflict, decision-making, leadership, nonverbal messages, language, and interpersonal relationships. Focus on definitions of sex and gender in regard to knowledge, social constructs, and self-development.
Recommended: COMM 321

COMM 537. HEALTH COMMUNICATION. (3 Credits)
This class is designed to unpack various elements of how communication impacts health, and vice versa. There are three main sections to this course: 1) discussing doctor-patient communication, 2) discussing the effects of health campaigns, and 3) discussing the link between communication and both psychological and physiological health.

COMM 540. THEORIES OF CONFLICT AND CONFLICT MANAGEMENT. (3 Credits)
Conflict on a variety of levels: intrapersonal, interpersonal, group, public, and social. Conflict in a variety of contexts: relationships, family, organizations, community, and society. Constructive and destructive means of confronting and managing conflict; social and psychological aspects of conflict; conflict analysis; causes of conflict; conflict and peace, social order, and social change; case studies of conflict.
Recommended: COMM 321

COMM 542. BARGAINING AND NEGOTIATION PROCESSES. (3 Credits)
Theory and practice of bargaining and negotiation as means of settling disputes, with emphasis on the role of communication. Strategies and tactics of distributive and integrative bargaining orientations. Negotiation preparation and experience through case studies and simulations.
Recommended: COMM 321

COMM 544. THIRD PARTIES IN DISPUTE RESOLUTION: MEDIATION/ARBITRATION. (3 Credits)
Philosophies, strategies, practices, and characteristics of mediation and arbitration processes in the settlement of conflicts and disputes. Study of the role of the third party neutral in the peace making process. Case studies and simulations in mediation and arbitration.
Recommended: COMM 321

COMM 546. COMMUNICATION IN INTERNATIONAL CONFLICT AND DISPUTES. (3 Credits)
Examination of the nature of international conflicts and disputes and the roles culture and communication play in resolving them constructively. Analysis of negotiation, mediation, and international law as approaches to dealing with international political, economic, cultural, and religious disputes. Scrutiny of contemporary world conflicts.
Recommended: COMM 321

COMM 550. COMMUNICATION AND THE PRACTICE OF SCIENCE. (3 Credits)
Communication is central to science-based decision-making, the function of science teams, the reporting and critique of scientific knowledge, and the interface between science and policy making. This seminar emphasizes communication competence in the arena of applied science; that is, science as practiced in government agencies, private corporations, and nonprofit organizations.

COMM 554. ADVANCED ARGUMENTATION. (3 Credits)
Advanced study in classical and current theories of the persuasive and epistemological functions of argumentation. Examination of the dominant contemporary theorists, including Toulmin, Perelman, and Willard. Analysis of research and applied perspectives, including conversational argument, argument fields, the philosophy of argument, argument as rhetoric, and argument in contexts.
Recommended: COMM 320

COMM 556. RHETORIC: 500 BC TO 500 AD. (3 Credits)
History and philosophy of rhetorical principles.
Recommended: COMM 320

COMM 558. RHETORIC: 500 AD TO 1900. (3 Credits)
History and philosophy of rhetorical principles.
Recommended: COMM 320

COMM 559. CONTEMPORARY THEORIES OF RHETORIC. (3 Credits)
A survey of contemporary rhetorical theories from 1900 to the present.
Recommended: COMM 320

COMM 560. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1750 TO 1900. (3 Credits)
Speech criticism; great American speakers, relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements.
Recommended: COMM 320

COMM 562. RHETORIC OF REVOLUTIONARIES AND REACTIONARIES: 1900-PRESENT. (3 Credits)
Speech criticism; great American speakers, relation of their speaking to the history of ideas; rhetoric and political, social, and religious movements.
Recommended: COMM 320

COMM 564. RHETORICAL CRITICISM. (3 Credits)
Explores the approaches to the criticism of rhetoric, including aesthetic, social movement, genre, feminist, and other modes of criticism.
Recommended: COMM 320

COMM 565. RESEARCH METHODS IN RHETORIC. (3 Credits)
A graduate-level introduction to research methods in rhetorical studies. Topics include rhetorical criticism, discourse analysis, and historiography. Course goals include the ability to understand and critique common methodological approaches in rhetorical studies.

COMM 566. ETHICS OF RHETORIC. (3 Credits)
Examines the ethical questions raised by the use of persuasive discourse, including the derivation of standards of ethical persuasion and approaches to ethical judgment about persuasion.
Recommended: COMM 320

COMM 572. THE RHETORIC OF POPULAR CULTURE. (3 Credits)
A survey of theories of popular culture from Arnold to Hall. Students will examine various artifacts of popular culture popular culture and the influences they exert.
Prerequisites:

Thorough treatment of the basic elements of C, bitwise operations, flow control, input/output, functions, arrays, strings, and structures. Lec/lab.

Recommended: COMM 320

COMM 587. POLITICAL CAMPAIGN RHETORIC. (3 Credits)
Theory, research and methods of political campaign rhetoric. Topics include rhetorical strategies and tactics in advertising, national conventions, broadcast debates, media coverage and public opinion polls.

Recommended: COMM 320

COMM 588. MEDIA CRITICISM. (3 Credits)
a critical examination of the media analysis of content, forms and deployment of media messages and products. A critical study of the structure, functions and economics of media systems. A consideration of media ethics and responsibilities in relation to news and information, entertainment, advertising and marketing, and social-cultural influence.

Recommended: COMM 280

COMM 590. GRADUATE SEMINAR IN RHETORIC. (3 Credits)
Examines topics dealing with the current state of research in rhetorical studies. This includes discussing a number of approaches to the history, theory, and criticism of rhetoric, as well as to the relationship between rhetoric and related disciplines. Course goals include increased competence in understanding the current state of rhetorical theory and research in the area being explored.

This course is repeatable for 9 credits.

COMM 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

COMM 808. WORKSHOP. (1-16 Credits)
Through reading, dialogue, reflection, and appreciative inquiry, participants will become more aware of our differences and similarities from an intercultural perspective. Through study and practice, participants will develop skills to more effectively communicate with culturally different others.

This course is repeatable for 16 credits.

Computer Science (CS)

CS 101. COMPUTERS: APPLICATIONS AND IMPLICATIONS. (4 Credits)
The varieties of computer hardware and software. The effects, positive and negative, of computers on human lives. Ethical implications of information technology. Hands-on experience with a variety of computer applications. Lec/lab.

CS 151. INTRODUCTION TO PROGRAMMING I WITH EMBEDDED CONTROL LAB. (4 Credits)
Thorough treatment of the basic elements of C, bitwise operations, flow of control, input/output, functions, arrays, strings, and structures. Lec/lab.

Prerequisites: MTH 111 with C or better or MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better

Equivalent to: ECE 151

CS 160. COMPUTER SCIENCE ORIENTATION. (3 Credits)
Introduction to the computer science field and profession. Team problem solving. Introduction to writing computer programs. Approaches to teaching course topics vary across sections. Lec/lab.

Equivalent to: CS 160H

CS 160H. COMPUTER SCIENCE ORIENTATION. (3 Credits)
Introduction to the computer science field and profession. Team problem solving. Introduction to writing computer programs. Approaches to teaching course topics vary across sections. Lec/lab.

Attributes: HNRS – Honors Course Designator

Equivalent to: CS 160

CS 161. INTRODUCTION TO COMPUTER SCIENCE I. (4 Credits)
Overview of fundamental concepts of computer science. Introduction to problem solving, software engineering, and object-oriented programming. Includes algorithm design and program development. Lec/lab/rec.

Prerequisites: MTH 112 (may be taken concurrently) with C or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 061

Equivalent to: EECS 161

CS 162. INTRODUCTION TO COMPUTER SCIENCE II. (4 Credits)
Basic data structures. Computer programming techniques and application of software engineering principles. Introduction to analysis of programs. Lec/lab/rec.

Prerequisites: CS 161 with C or better or EECS 161 with C or better

Equivalent to: EECS 162

CS 165. ACCELERATED INTRODUCTION TO COMPUTER SCIENCE. (8 Credits)
Overview of the fundamental concepts of computer science. Introduction to problem solving, algorithm development, data types, and basic data structures. Introduction to analysis of algorithms and principles of software engineering. System development and computer programming using procedural/object-oriented paradigms. Offered via ECampus only.

Prerequisites: MTH 112 with C or better or Math Placement - ALEKS with a score of 075

CS 175. *COMMUNICATIONS SECURITY AND SOCIAL MOVEMENTS. (3 Credits)
Equipping students with the theory and practice of communications security, this course explores how social movements can remain effective in the context of mass surveillance and state repression. Lec/rec. (Bacc Core Course)

Attributes: CPDP – Core, Perspective/Difference/Power/Discrimination

CS 195. WEBSITE DESIGN. (4 Credits)
How to design and publish a static website using an existing publishing platform: Techniques and tools for designing and publishing on the World Wide Web; hypertext and HTML; site and page design; media integration; issues raised by Internet publishing.

Equivalent to: CS 295

CS 199. SPECIAL TOPICS/COMPUTER SCIENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CS 201. COMPUTER PROGRAMMING FOR NON-CS MAJORS. (3 Credits)
Covers a variety of fundamental topics in computer programming relevant to anyone who wants to write or work with computer code in their work or studies. Teaches basic computational thinking and programming skills which will allow students to solve a variety of real-world problems. In addition, students will learn more advanced topics such as how some basic algorithms work and can be written in computer code.

Prerequisites: MTH 111 with C- or better
CS 225. DISCRETE STRUCTURES IN COMPUTER SCIENCE. (4 Credits)
An introduction to the discrete mathematics of computer science, including logic, set and set operations, methods of proof, recursive definitions, combinatorics, and graph theory. (Note: Students may take either MTH 231 or CS 225, but cannot receive credit for both.)
Prerequisites: MTH 111 with C or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 061 or MTH 112 (may be taken concurrently) with C or better

CS 261. DATA STRUCTURES. (4 Credits)
Abstract data types, dynamic arrays, linked lists, trees and graphs, binary search trees, hash tables, storage management, complexity analysis of data structures. Lec/rec.
Prerequisites: (CS 162 with C or better or CS 165 with C or better) and (CS 225 [C] or MTH 231 [C])
Equivalent to: EECS 261

CS 262. PROGRAMMING PROJECTS IN C++. (4 Credits)
Learning a second computer programming language. Elements of C++. Object-oriented programming. Experience team work on a large programming project.
Prerequisites: CS 261 with C or better

CS 271. COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE. (4 Credits)
Introduction to functional organization and operation of digital computers. Coverage of assembly language; addressing, stacks, argument passing, arithmetic operations, decisions, macros, modularization, linkers and debuggers.
Prerequisites: CS 151 with C or better or CS 161 with C or better or CS 165 with C or better or ECE 151 with C or better

CS 290. WEB DEVELOPMENT. (4 Credits)
How to design and implement a multi-tier application using web technologies: Creation of extensive custom client- and server-side code, consistent with achieving a high-quality software architecture.
Prerequisites: CS 162 with C or better or CS 165 with C or better
Equivalent to: CS 494

CS 295. WEBSITE MANAGEMENT. (4 Credits)
How to create and promote a dynamic website using existing frameworks/libraries: Designing, developing, publishing, maintaining, and marketing dynamic websites; web security and privacy issues; emerging web technologies; running a website marketing campaign.
Prerequisites: CS 195 with C or better
Recommended: Basic HTML and CSS

CS 312. SYSTEM ADMINISTRATION. (4 Credits)
Prerequisites: (CS 311 with C or better or CS 344 with C or better) and CS 372 [C]

CS 321. INTRODUCTION TO THEORY OF COMPUTATION. (3 Credits)
Survey of models of computation including finite automata, formal grammars, and Turing machines.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 321H

CS 321H. INTRODUCTION TO THEORY OF COMPUTATION. (3 Credits)
Survey of models of computation including finite automata, formal grammars, and Turing machines.
Attributes: HNRS – Honors Course Designator
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 321

CS 325. ANALYSIS OF ALGORITHMS. (4 Credits)
Recurrence relations, combinatorics, recursive algorithms, proofs of correctness.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 325H

CS 325H. ANALYSIS OF ALGORITHMS. (4 Credits)
Recurrence relations, combinatorics, recursive algorithms, proofs of correctness.
Attributes: HNRS – Honors Course Designator
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])
Equivalent to: CS 325

CS 331. INTRODUCTION TO ARTIFICIAL INTELLIGENCE. (4 Credits)
Fundamental concepts in artificial intelligence using the unifying theme of an intelligent agent. Topics include agent architectures, search, games, logic and reasoning, and Bayesian networks.
Prerequisites: CS 325 with C or better or CS 325H with C or better

CS 340. INTRODUCTION TO DATABASES. (4 Credits)
Design and implementation of relational databases, including data modeling with ER or UML, diagrams, relational schema, SQL queries, relational algebra, user interfaces, and administration.
Prerequisites: CS 290 with C or better
Equivalent to: CS 275

CS 344. OPERATING SYSTEMS I. (4 Credits)
Introduction to operating systems using UNIX as the case study. System calls and utilities, fundamentals of processes and interprocess communication.
Prerequisites: CS 261 with C or better and (CS 271 [C] or ECE 271 [C])
Equivalent to: CS 311
Recommended: Experience programming in the C language

CS 352. INTRODUCTION TO USABILITY ENGINEERING. (4 Credits)
Basic principles of usability engineering methods for the design and evaluation of software systems. Includes the study of human-machine interactions, user interface characteristics and design strategies, software evaluation methods, and related guidelines and standards.
Prerequisites: CS 151 with C or better or CS 161 with C or better or CS 165 with C or better or CS 295 with C or better or ECE 151 with C or better
Equivalent to: CS 252

CS 361. SOFTWARE ENGINEERING I. (4 Credits)
Introduction to the ’front end’ of the software engineering lifecycle; requirements analysis and specification; design techniques; project management.
Prerequisites: CS 261 with C or better

CS 362. SOFTWARE ENGINEERING II. (4 Credits)
Introduction to the ’back end’ of the software engineering lifecycle implementation; verification and validation; debugging; maintenance.
Prerequisites: CS 261 with C or better
Recommended: Experience with object-oriented programming and data structures (eg. CS 161, CS 162, CS 361)

CS 370. INTRODUCTION TO SECURITY. (4 Credits)
Introductory course on computer security with the objective to introduce concepts and principles of computer systems security. Notions of security, basic cryptographic primitives and their application, basics of authentication and access control, basics of key-management, basics of malware and software security.
Prerequisites: CS 344 (may be taken concurrently) with C or better
CS 372. INTRODUCTION TO COMPUTER NETWORKS. (4 Credits)
Computer network principles, fundamental networking concepts, packet-switching and circuit switching, TCP/IP protocol layers, reliable data transfer, congestion control, flow control, packet forwarding and routing, MAC addressing, multiple access techniques. CROSSLISTED as CS 372/ECE 372.
Prerequisites: CS 261 with C or better and (ECE 271 [C] or CS 271 [C])
Equivalent to: ECE 372
Recommended: C programming and Unix familiarity.

CS 373. DEFENSE AGAINST THE DARK ARTS. (4 Credits)
Introduction to the current state of the art in anti-malware, computer forensics, and networking, messaging, and web security. Broad introduction to the field of computer security.
Prerequisites: CS 344 with C or better and CS 340 [C] and CS 372 [C]

CS 381. PROGRAMMING LANGUAGE FUNDAMENTALS. (4 Credits)
An introduction to the concepts found in a variety of programming languages. Programming languages as tools for problem solving. A brief introduction to languages from a number of different paradigms.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C])

CS 391. *SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE. (3 Credits)
In-depth exploration of the social, psychological, political, and ethical issues surrounding the computer industry and the evolving information society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: CS 391H, CS 391H
Recommended: CS 101 or computer literacy.

CS 391H. *SOCIAL AND ETHICAL ISSUES IN COMPUTER SCIENCE. (3 Credits)
In-depth exploration of the social, psychological, political, and ethical issues surrounding the computer industry and the evolving information society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: CS 391
Recommended: CS 101 or computer literacy

CS 395. WEBSITE MULTIMEDIA. (4 Credits)
How to create and deploy interactive digital multimedia through static websites: Technological, aesthetic, and pedagogical issues of communication using interactive multimedia and hypermedia; techniques for authoring interactive multimedia projects using a variety of digital media roots.
Prerequisites: CS 195 with C or better or (ART 120 with C or better and (CS 162 [C] or CS 165 [C])

CS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

CS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CS 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: CS 407H
This course is repeatable for 16 credits.

CS 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 407
This course is repeatable for 16 credits.

CS 410. OCCUPATIONAL INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

CS 419. SELECTED TOPICS IN COMPUTER SCIENCE. (0-5 Credits)
Topics of special and current interest not covered in other courses.
Equivalent to: CS 419H
This course is repeatable for 99 credits.

CS 419H. SELECTED TOPICS IN COMPUTER SCIENCE. (1-5 Credits)
Topics of special and current interest not covered in other courses.
Attributes: HNRS – Honors Course Designator
Equivalent to: CS 419
This course is repeatable for 99 credits.

CS 420. GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE. (3 Credits)
Directed and undirected graphs; paths, circuits, trees, coloring, planar graphs, partitioning; computer representation of graphs and graph algorithms; applications in software complexity metrics, program testing, and compiling.
Prerequisites: (CS 325 with C or better or CS 325H with C or better)

CS 427. CRYPTOGRAPHY. (4 Credits)
Introduction to the theory and practice of modern cryptography. Fundamental primitives including pseudorandom generators, block ciphers, hash functions. Symmetric-key cryptography for privacy and authenticity. Public-key cryptography based on number-theoretic problems.
Prerequisites: CS 261 with C or better or MTH 355 with C or better

CS 434. MACHINE LEARNING AND DATA MINING. (4 Credits)
Introduction to machine learning and data mining algorithms (supervised learning, unsupervised learning, and reinforcement learning) tools that are widely employed in industrial and research settings.
Prerequisites: CS 325 with C or better or CS 325H with C or better

CS 440. DATABASE MANAGEMENT SYSTEMS. (4 Credits)
Relational database design, normalization, file structures, disk storage, query processing and optimization, team development of database applications.
Prerequisites: CS 261 with C or better and (CS 275 [C] or CS 340 [C])

CS 444. OPERATING SYSTEMS II. (4 Credits)
Principles of computer operating systems: concurrent processes, memory management, job scheduling, multiprocessing, file systems, performance evaluation, and networking. Lec/rec.
Prerequisites: (CS 311 with C or better or CS 344 with C or better) and (CS 271 [C] or ECE 375 [C])
Equivalent to: CS 411

CS 446. NETWORKS IN COMPUTATIONAL BIOLOGY. (3 Credits)
An introduction to biological networks and computational methods for their analysis, inference, and functional modeling. Various network centralities, topological measures, clustering algorithms, and probabilistic annotation models are introduced in the context of protein interaction, gene regulatory, and metabolic networks. The course also surveys bioinformatics methods for data-driven inference of network structure.
Prerequisites: CS 261 with C or better
Recommended: Completion or concurrent enrollment in CS 325
CS 447. WIRELESS EMBEDDED SYSTEMS. (4 Credits)
A hands-on introduction to programming wireless embedded systems (aka the 'Internet of Things'). Topics include sensors, actuators, state machines, scheduling, wireless communications, time synchronization, localization, fault tolerance, and security related to cyber-physical systems.
Prerequisites: CS 344 with C or better

CS 450. INTRODUCTION TO COMPUTER GRAPHICS. (4 Credits)
Prerequisites: CS 261 with C or better and (MTH 306 [C] or MTH 306H [C] or MTH 341 [C])

CS 453. SCIENTIFIC VISUALIZATION. (4 Credits)
Applies 3D computer graphics methods to visually understand scientific and engineering data. Methods include hyperbolic projections; mapping scalar values to color spaces; data visualization using range sliders; scalar visualization (point clouds, cutting planes, contour plots, isolines); vector visualization (arrow clouds, particle advection, streamlines); terrain visualization; Delauney triangulation; and volume visualization.
Recommended: Prior experience with Unix or Windows, programming experience.

CS 457. COMPUTER GRAPHICS SHADERS. (4 Credits)
Theoretical and practical treatment of computer graphics shaders, including both RenderMan and GPU shaders. Programming in both RenderMan and OpenGL shading languages.
Recommended: Previous graphics pipeline programming experience.

CS 458. INTRODUCTION TO INFORMATION VISUALIZATION. (4 Credits)
Tools and techniques for designing, developing, and deploying interactive visualizations of abstract data sources. Discusses techniques based on principles from design, cognitive science, and perceptual psychology. Topics include 1D, 2D, 3D, multivariate representations, time-series, graphs and trees, text and documents, and interaction techniques.
Prerequisites: CS 361 with C or better

CS 461. SENIOR SOFTWARE ENGINEERING PROJECT I. (3 Credits)
Utilize software engineering methodology in a team environment to develop a real-world application. Teams will be responsible for all phases of software development, including project planning, requirements analysis, design, coding, testing, configuration management, quality assurance, documentation, and delivery. Three-term sequence required. This course fulfills the WIC requirement for computer science majors.
(Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CS 361 with C or better

CS 462. SENIOR SOFTWARE ENGINEERING PROJECT II. (3 Credits)
Utilize software engineering methodology in a team environment to develop a real-world application. Teams will be responsible for all phases of software development, including project planning, requirements analysis, design, coding, testing, configuration management, quality assurance, documentation, and delivery. Three-term sequence required.
(Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CS 362 with C or better and CS 461 [C]

CS 463. SENIOR SOFTWARE ENGINEERING PROJECT. (2 Credits)
Utilize software engineering methodology in a team environment to develop a real-world application. Teams will be responsible for all phases of software development, including project planning, requirements analysis, design, coding, testing, configuration management, quality assurance, documentation, and delivery. Three-term sequence required.
Prerequisites: CS 462 with C or better

CS 464. OPEN SOURCE SOFTWARE. (4 Credits)
Provides a theoretical foundation of the history, key concepts, technologies, and practices associated with modern Free and Open Source Software (FOSS) projects, and gives students an opportunity to explore and make contributions to FOSS projects with some mentoring and guidance.
Prerequisites: CS 261 with C or better or CS 361 with C or better

CS 466. WEB-BASED START-UP PROJECT. (4 Credits)
Real-world, hands-on learning in a high-tech web/mobile-based company environment. Research in the development of product ideas, hypotheses, and business models to create customer experiments. Prototyping and statistical analysis to develop, optimize, and evaluate solutions. Rapid iteration/refactoring based on customer input, web analytics, and user engagement metrics. Offered at OSU-Cascades only.
Corequisites: CS 461

CS 467. ONLINE CAPSTONE PROJECT. (4 Credits)
Real-world team-based experience with the software engineering design and delivery cycle, including requirements analysis and specification, design techniques, and requirements and final project written documentation. For students in the online CS double-degree program only.
Prerequisites: CS 344 with C or better and CS 361 [C] and CS 362 [C]

CS 468. INCLUSIVE DESIGN (HCI). (4 Credits)
Inclusive design is designing software that works for a wide variety of differently abled customers. Teaches the skills needed to design inclusively without having to have a separate design for each differently abled customer.
Prerequisites: CS 352 with C or better
Recommended: CS 565 with a minimum grade of C

CS 472. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/EC 472 and CS 572/ECE 572.
Prerequisites: ECE 375 with C or better
Equivalent to: CS 470, ECE 472

CS 475. INTRODUCTION TO PARALLEL PROGRAMMING. (4 Credits)
Theoretical and practical survey of parallel programming, including a discussion of parallel architectures, parallel programming paradigms, and parallel algorithms. Programming one or more parallel computers in a higher-level parallel language.
Prerequisites: CS 261 with C or better
CS 476. ADVANCED COMPUTER NETWORKING. (4 Credits)
Prerequisites: (CS 372 with C or better or ECE 372 with C or better) and (ECE 353 [C] or ST 314 [C] or ST 314H [C])
Equivalent to: ECE 476, EEC 476

CS 477. INTRODUCTION TO DIGITAL FORENSICS. (4 Credits)
Introduces concepts related to digital forensics, its role and importance, and tools and techniques for collecting and curating digital evidence. The course will also discuss the role of evidence in the justice system and some legal aspects as they pertain to digital forensics. It will introduce tools and techniques for computer and network forensics.
Prerequisites: CS 344 with C or better and CS 370 [C]

CS 478. NETWORK SECURITY. (4 Credits)
Basic concepts and techniques in network security, risks and vulnerabilities, applied cryptography and various network security protocols. Coverage of high-level concepts such as authentication, confidentiality, integrity, and availability applied to networking systems. Fundamental techniques including authentication protocols, group key establishment and management, trusted intermediaries, public key infrastructures, SSL/TLS, IPsec, firewalls and intrusion detection CROSSLISTED as CS 478/ECE 478.
Prerequisites: CS 372 with C or better or ECE 372 with C or better
Equivalent to: ECE 478
Recommended: CS 370

CS 480. TRANSLATORS. (4 Credits)
An introduction to compilers; attribute grammars, syntax-directed translation, lex, yacc, LR(1) parsers, symbol tables, semantic analysis, and peephole optimization.
Prerequisites: (CS 344 with C or better or CS 311 with C or better) and CS 321 [C]

CS 491. COMPUTER SCIENCE SKILLS FOR SIMULATION AND GAME PROGRAMMING. (4 Credits)
Game and simulation development is very much a data and math-intensive activity. A certain number of actions must be produced, and producing them by hand is hard. This is a middleware CS course that fills in many of the missing pieces for those wanting to enter the simulation and game development worlds in a software tool-building capacity.
Prerequisites: CS 261 with C or better and (CS 225 [C] or MTH 231 [C]) and MTH 252 [C]

CS 492. MOBILE SOFTWARE DEVELOPMENT. (4 Credits)
Introduction to concepts and techniques for developing mobile applications. Students will become familiar with modern mobile structure, implementation, development tools, and workflow.
Prerequisites: CS 344 with C or better

CS 493. CLOUD APPLICATION DEVELOPMENT. (4 Credits)
Covers developing RESTful cloud services, an approach based on representational state transfer technology, an architectural style and approach to communications used in modern cloud services development.
Prerequisites: CS 290 with C or better and CS 340 [C] and CS 372 [C]

CS 495. INTERACTIVE MULTIMEDIA PROJECTS. (4 Credits)
Students apply principles and procedures of digital art, design, communication, and software authoring while working on large integrated media projects.
Recommended: CS 395

CS 496. MOBILE AND CLOUD SOFTWARE DEVELOPMENT. (4 Credits)
Introduction to the concepts and techniques for developing mobile and cloud applications.
Prerequisites: CS 344 with C or better or CS 311 with C or better
Recommended: Working knowledge of at least one operating system

CS 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CS 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

CS 503. COMPUTER SCIENCE MS THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

CS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 20 credits.

CS 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

CS 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

CS 510. OCCUPATIONAL INTERNSHIP. (1-4 Credits)
This course is repeatable for 99 credits.

CS 511. PROGRAMMING AND DATA STRUCTURES. (4 Credits)
Computer programming, problem solving, data structures, object-oriented programming, recursion, sorting, dynamic programming, asymptotic time complexity.
Recommended: College algebra, plus the ability to navigate an operating system, manipulate files, and use a command line.

CS 512. DATA SCIENCE TOOLS AND PROGRAMMING. (4 Credits)
Accessing and distributing data in the cloud; relational and non-relational databases; map reduction; cloud data processing; load balancing; types of data stores used in the cloud.
Recommended: CS 511 or an equivalent course or programming experience in a high-level language like Python, Java or C++.

CS 515. ALGORITHMS AND DATA STRUCTURES. (4 Credits)
Greedy algorithms, divide and conquer, dynamic programming, network flow, data structures.
Recommended: Undergraduate course in algorithms

CS 516. THEORY OF COMPUTATION AND FORMAL LANGUAGES. (4 Credits)

CS 517. THEORY OF COMPUTATION. (4 Credits)
Turing machines, decidability, NP-completeness, complexity classes, randomized computation, relativization, circuit complexity, interactive proof systems, lower bounds, cryptography.

CS 519. SELECTED TOPICS IN COMPUTER SCIENCE. (0-5 Credits)
Topics of special and current interest not covered in other courses. May not be offered every year.
This course is repeatable for 99 credits.
CS 520. GRAPH THEORY WITH APPLICATIONS TO COMPUTER SCIENCE. (3 Credits)
Directed and undirected graphs; paths, circuits, trees, coloring, planar graphs, partitioning; computer representation of graphs and graph algorithms; applications in software complexity metrics, program testing, and compiling.
Recommended: CS 325 and MTH 232

CS 521. COMPUTABILITY. (4 Credits)
Recommended: CS 516

CS 523. ADVANCED ALGORITHMS. (4 Credits)
Approximation algorithms, randomized and probabilistic algorithms, online algorithms.
Recommended: CS 515

CS 524. NP-COMPLETE AND HARDER PROBLEMS. (4 Credits)
Recommended: CS 523

CS 527. ERROR-CORRECTING CODES. (4 Credits)
Hamming codes, linear codes, cyclic codes, BCH and Reed-Solomon codes. Introduction to Galois fields. Encoding and decoding algorithms. Burst error correcting codes, asymmetric and unidirectional codes. Applications of codes for computer systems.
Recommended: Discrete math and probability

CS 529. SELECTED TOPICS IN THEORETICAL COMPUTER SCIENCE. (1-5 Credits)
Topics of interest in algorithms and theory of computation. Topics include approximation algorithms, planar graph algorithms, distributed algorithms, combinatorial optimization, computational geometry. This course is repeatable for 99 credits.
Recommended: CS 515

CS 531. ARTIFICIAL INTELLIGENCE. (4 Credits)

CS 532. ADVANCED ARTIFICIAL INTELLIGENCE. (4 Credits)
Recommended: CS 531

CS 533. INTELLIGENT AGENTS AND DECISION MAKING. (4 Credits)
Recommended: CS 531

CS 534. MACHINE LEARNING. (4 Credits)

CS 535. DEEP LEARNING. (4 Credits)
Prerequisites: CS 534 with C or better or ROB 537 with C or better

CS 536. PROBABILISTIC GRAPHICAL MODELS. (4 Credits)
Representation of probabilistic graphical models, both directed (Bayesian networks) and undirected (Markov networks). Exact and approximate inference techniques. Parameter and structure learning from data.
Recommended: Strong programming skills

CS 537. COMPUTER VISION I. (3 Credits)
An introduction to low-level computer vision and visual geometry. Topics of interest include the following: detection of interest points and edges, matching points and edges, color models, projective geometry, camera calibration, epipolar geometry, homography, image stitching, and multitarget tracking.
Recommended: Undergraduate-level statistics, probability, calculus, linear algebra, good programming skills, machine learning or AI

CS 539. SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE. (0-5 Credits)
Advanced topics in artificial intelligence. Typical topics include machine learning for sequential and spatial data, knowledge representation and inference, probabilistic modeling of complex systems, data mining and information extraction. This course is repeatable for 99 credits.

CS 540. DATABASE MANAGEMENT SYSTEMS. (4 Credits)
Purpose of database systems, levels of data representation. Entity-relationship model. Relational systems: data definition, data manipulation, query language (SQL), relational calculus and algebra, data dependencies and normal forms. DBTG network model. Query optimization, recovery, concurrency control.
Recommended: CS 261

CS 544. OPERATING SYSTEMS II. (4 Credits)
Principles of computer operating systems: concurrent processes, memory management, job scheduling, multiprocessor, file systems, performance evaluation, and networking. Lec/rec. Equivalent to: CS 511
Recommended: (CS 311 or CS 344) and (CS 271 or ECE 375)

CS 546. NETWORKS IN COMPUTATIONAL BIOLOGY. (3 Credits)
An introduction to biological networks and computational methods for their analysis, inference, and functional modeling. Various network centralities, topological measures, clustering algorithms, and probabilistic annotation models are introduced in the context of protein interaction, gene regulatory, and metabolic networks. The course also surveys bioinformatics methods for data-driven inference of network structure.
Recommended: Completion or concurrent enrollment in CS 325
CS 549. SELECTED TOPICS ON DATA SCIENCE & SYSTEMS. (0-5 Credits)
Current topics in data science and systems, e.g. querying, inference, and learning over large datasets; reasoning and learning on graph, heterogeneous, and multi-modal data; data curation; knowledge representation; systems for large data exploration and analytics; distributed data systems; human-centered data science; fairness and responsibility in data science. 
This course is repeatable for 99 credits.
Recommended: CS 540

CS 550. INTRODUCTION TO COMPUTER GRAPHICS. (4 Credits)
Recommended: CS 261 and (MTH 306 or MTH 306H or MTH 341)

CS 551. COMPUTER GRAPHICS. (4 Credits)
3-D graphics hardware: Line and polygon scan conversion, modeling transformations, viewing transformations, matrix stacks, hierarchical models, perspective and orthographic projections, visible surface determination, illumination models, shading models, texture mapping, ray tracing.
Recommended: CS 450 or CS 550

CS 552. COMPUTER ANIMATION. (4 Credits)
Traditional animation concepts: production pipeline, keyframing implementation, interpolation, point-mass dynamics, spring-mass systems, rigid body dynamics, forward and inverse kinematics, human motion control, motion capture.
Recommended: CS 551

CS 553. SCIENTIFIC VISUALIZATION. (4 Credits)
Applies 3D computer graphics methods to visually understand scientific and engineering data. Methods include hyperbolic projections; mapping scalar values to color spaces; data visualization using range sliders; scalar visualization (point clouds, cutting planes, contour plots, isosurfaces); vector visualization (arrow clouds, particle advection, streamlines); terrain visualization; Delauney triangulation; and volume visualization.
Recommended: Prior experience with Unix or Windows, programming experience.

CS 554. GEOMETRIC MODELING IN COMPUTER GRAPHICS. (4 Credits)
Advanced topics in computer graphics focusing on representation and processing of polygonal models and their application. Surface fundamentals; discrete differential geometry and topology; data structures for representing 3-D surfaces; surface subdivision and smoothing; mesh simplification and multi-resolution representation of 3-D surfaces; geometry compression; surface parameterization; geometry remeshing; topological simplification; implicit surfaces.
Recommended: CS 450

CS 555. SIGNAL AND IMAGE PROCESSING. (4 Credits)
Fundamental aspects of signal and image processing including image acquisition and display, histograms, level-set and geometric operations, convolutions, Fourier transform, image filtering, sampling theory, image transforms, human vision, color, morphological operations, and image compression.
Recommended: Knowledge of C/C++

CS 556. DATA-DRIVEN SOFTWARE ENGINEERING. (4 Credits)
An overview of data-driven empirical research methods that can be used to understand the different aspects of software engineering.
Prerequisites: CS 561 with C or better

CS 557. COMPUTER GRAPHICS SHADERS. (4 Credits)
Theoretical and practical treatment of computer graphics shaders, including both RenderMan and GPU shaders. Programming in both RenderMan and OpenGL shading languages.
Recommended: Previous graphics pipeline programming experience.

CS 559. SELECTED TOPICS IN COMPUTER GRAPHICS AND VISION. (0-5 Credits)
Advanced topics in graphics, animation, and vision. Topics include distribution ray tracing, global-illumination, radiosity, image-based modeling and rendering, vision-assisted image and video editing, 3-D vision, 3-D virtual environments, 3-D interaction, control for physical simulation, motion graphs, computational geometry, etc.
This course is repeatable for 99 credits.

CS 560. SOFTWARE ENGINEERING METHODS. (4 Credits)
Master software engineering methods and supporting tools in the context of agile processes. Teams will engage in all aspects of software development including design, testing, implementation, deployment and maintenance. 3 hours of lecture per week plus one-hour independent lab per week.
Recommended: CS 362

CS 561. SOFTWARE ENGINEERED PROJECT MANAGEMENT. (4 Credits)
Master software project management with an emphasis on timely, cost-effective delivery of high-quality systems. Learn about existing techniques and supporting tools, with a particular focus on coordination and project management. 3 hours of lecture per week plus one-hour independent lab per week.
Recommended: CS 561

CS 563. SOFTWARE MAINTENANCE AND EVOLUTION. (4 Credits)
Contribute to the cutting-edge of software engineering. Learn about existing techniques and supporting tools, with a particular focus on maintenance and evolution. Identify opportunities to support software maintenance and evolution more effectively, by creating new knowledge and supporting systems through research and innovation. 3 hours of lecture per week plus one-hour independent lab per week.
Prerequisites: CS 561 with C or better

CS 564. FIELD STUDIES IN SE AND HCI. (4 Credits)
Deals with the type of empirical study known as the ‘case’ study. These are studies that collect data from natural software development situations as they really occur in the field, in which the researcher does not manipulate or ‘control’ anything. The course is an end-to-end coverage of the process. Mainly focuses on case studies involving human software developers in the field. The student will conduct a field study as part of this course.

CS 565. HUMAN-COMPUTER INTERACTION. (4 Credits)
Basic principles of Human-Computer Interaction (HCI) for the design and evaluation of software systems. Includes research methods for studying human-machine interactions and user interfaces, design strategies, software evaluation methods, and related guidelines and standards.

CS 567. LABORATORY STUDIES IN SE AND HCI. (4 Credits)
Empirical lab studies of software development. Covers how to go about designing, preparing for, running, analyzing, and writing-for-publication lab experiments of programming situations involving human subjects. This is an end-to-end coverage of the entire process, and will put students in a position to conduct lab studies of their own with human subjects.
CS 568. INCLUSIVE DESIGN (HCL). (4 Credits)
Inclusive design is designing software that works for a wide variety of differently abled customers. Teaches the skills needed to design inclusively without having to have a separate design for each differently abled customer.

Recommended: CS 352 [C] or CS 565 [C]

CS 569. SELECTED TOPICS IN SOFTWARE ENGINEERING. (0-5 Credits)
Topics include new programming methodologies, productivity, software development, software complexity metrics.

This course is repeatable for 99 credits.

Recommended: CS 561

CS 570. HIGH PERFORMANCE COMPUTER ARCHITECTURE. (4 Credits)
Advanced concepts in computer architecture. Performance improvement employing advanced pipelining and multiple instruction scheduling techniques. Issues in memory hierarchy and management. CROSSTLISTED as CS 570/ECE 570.

Equivalent to: ECE 570

Recommended: ECE 472 or ECE 572

CS 572. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSTLISTED as CS 472/ECE 472 and CS 572/ECE 572.

Equivalent to: ECE 572

Recommended: ECE 375

CS 575. INTRODUCTION TO PARALLEL PROGRAMMING. (4 Credits)
Theoretical and practical survey of parallel programming, including a discussion of parallel architecture, parallel programming paradigms, and parallel algorithms. Programming one or more parallel computers in a higher-level parallel language.

CS 576. ADVANCED COMPUTER NETWORKING. (4 Credits)

Equivalent to: ECE 576

Recommended: (CS 372 or ECE 372) and (ECE 353 or ST 314 or ST 314H)

CS 578. CYBER-SECURITY. (4 Credits)
A broad overview of the field of computer and network security. Essential cryptographic mechanisms such as symmetric and public-key cryptography (e.g., encryption, signatures), network security and authentication protocols (e.g., Kerberos, TLS, IPSec), system security (e.g., access control, firewalls), advanced topics (e.g., searchable encryption, cloud security, secure computation). CROSSTLISTED as CS 578/ECE 578.

Equivalent to: ECE 578

CS 579. TOPICS IN COMPUTER ARCHITECTURE AND PARALLEL PROCESSING. (0-5 Credits)
Current topics in advanced computer architecture and parallel processing.

This course is repeatable for 99 credits.

Recommended: CS 575 or CS 572 or ECE 572

CS 581. PROGRAMMING LANGUAGES I. (4 Credits)
Graduate-level introduction to functional programming and programming language theory. Strongly typed functional programming in Haskell, abstract syntax and grammars, interpreters, denotational semantics, domain theory, and lambda calculus.

CS 582. PROGRAMMING LANGUAGES II. (4 Credits)
Essentials of programming language theory for understanding and conducting programming language research. Dependently typed programming in Agda, Coq, or Idris; operational semantics; type systems; unification and type inference.

Prerequisites: CS 581 with C or better

CS 583. ADVANCED FUNCTIONAL PROGRAMMING. (4 Credits)
Advanced functional programming concepts and strategies, with a focus on techniques useful for the design and implementation of programming languages. Includes higher-order abstract syntax, functors and monads, generalized algebraic data types, functional data structures, and graph reduction.

Prerequisites: CS 581 with C or better

CS 584. HUMAN FACTORS PROGRAMMING LANGUAGES. (4 Credits)
Principles and evaluation methods for designing and evaluating programming languages to emphasize human productivity. Overall goals are (a) to enable students to understand and apply these principles and methods, and (b) to introduce at least four programming languages that aim specifically at supporting human problem solving.

CS 585. DOMAIN-SPECIFIC LANGUAGES. (4 Credits)
Graduate-level introduction to the design and implementation of domain-specific languages (DSLs). Domain analysis; review and revision of language designs; binding constructs to support abstraction; definition of syntax and semantics of DSLs; prototype implementation of embedded DSL.

Prerequisites: CS 581 with C or better

CS 589. SELECTED TOPICS IN PROGRAMMING LANGUAGES. (1-5 Credits)
An in-depth examination of a specific topic of interest in programming language design and implementation. Example topics include object-oriented programming, parallel programming, compiler optimization, programming language semantics.

This course is repeatable for 99 credits.

CS 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

CS 601. RESEARCH. (1-16 Credits)
Graded P/N.

This course is repeatable for 99 credits.

CS 603. COMPUTER SCIENCE PHD THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

CS 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CS 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
CS 637. COMPUTER VISION II. (4 Credits)
An introduction to recent advances in visual recognition, including object detection, semantic segmentation, multimodal parsing of images and text, image captioning, face recognition, and human activity recognition. The course covers common formulations of these problems, including energy minimization on graphical models, and supervised machine learning approaches to low- and high-level recognition tasks.
Prerequisites: CS 535 with B+ or better or CS 537 with B- or better
Recommended: CS 519

Construction Engineering Mngmnt (CEM)

CEM 263. PLANE SURVEYING. (3 Credits)
Use of field surveying equipment; error analysis; plane surveying methods applied to construction; plane coordinate computations; topographic mapping; and introduction to GPS. Lec/rec.
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better

CEM 311. HYDRAULICS. (4 Credits)
Pressure and energy concepts of fluids, fluid measurements, flow in pipes and open channels.
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better

CEM 326. CONSTRUCTION SAFETY. (3 Credits)
Training in construction safety with emphasis on hazard identification, avoidance, control, and prevention. Lec/rec.
Prerequisites: CCE 207 with C or better or CEM 407 with C or better

CEM 341. CONSTRUCTION ESTIMATING I. (4 Credits)
Fundamentals of estimating and bidding construction projects; plan reading, specification interpretation; quantity take-off; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; estimating profit, and computer-aided estimating.
Prerequisites: CEM 442 with C or better
Recommended: CCE 102 and CCE 201

CEM 342. CONSTRUCTION ESTIMATING II. (4 Credits)
Fundamentals of estimating and bidding construction projects; plan reading, specification interpretation; quantity take-off; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; estimating profit, and computer-aided estimating.
Prerequisites: CEM 341 with C or better

CEM 343. CONSTRUCTION PLANNING AND SCHEDULING. (4 Credits)
Principles of construction planning, scheduling, and resource optimization; scheduling techniques and calculations; methods for integrating project resources (materials, equipment, personnel, and money) into the schedule.
Prerequisites: CEM 342 (may be taken concurrently) with C or better

CEM 381. STRUCTURES I. (4 Credits)
Introduction to statically determinate analysis and design of steel structures. Lec/rec.
Prerequisites: ENGR 213 with C or better or ENGR 213H with C or better

CEM 382. STRUCTURES II. (4 Credits)
Analysis and design of building elements of concrete and timber; detailing and fabrication. Lec/rec.
Prerequisites: CCE 321 (may be taken concurrently) with C or better and CEM 381 [C]

CEM 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

CEM 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

CEM 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

CEM 407. SEMINAR. (1 Credit)
Professional practices of construction engineering management.

CEM 431. OBTAINING CONSTRUCTION CONTRACTS. (4 Credits)
Preparing and effectively presenting detailed and complete proposals for the execution of construction projects.
Prerequisites: CEM 341 with C or better
Equivalent to: CEM 432

CEM 432. CONSTRUCTION PROJECT PLANNING. (3 Credits)
Planning and preparing cost estimates, schedules, site logistics plans for executing construction projects; presenting written and oral construction proposals.
Prerequisites: CEM 341 with C or better
Equivalent to: CEM 431

CEM 441. HEAVY CIVIL CONSTRUCTION MANAGEMENT. (4 Credits)
Heavy civil construction management methods. Construction equipment types, capabilities, costs, productivity, and the selection and planning of equipment needed for a project. Soil characteristics, quantity analysis, and movement on construction sites.
Prerequisites: FE 315 with C or better or CE 372 with C or better

CEM 442. BUILDING CONSTRUCTION MANAGEMENT. (4 Credits)
Building construction management and methods.
Prerequisites: CCE 207 with C or better or CEM 407 with C or better

CEM 443. PROJECT MANAGEMENT FOR CONSTRUCTION. (4 Credits)
Project management concepts for construction; concepts, roles and responsibilities, labor relations and supervision, administrative systems, documentation, quality management, and process improvement. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CEM 341 with C or better and CEM 343 [C]

CEM 471. ELECTRICAL FACILITIES. (4 Credits)
Principles and applications of electrical components of constructed facilities; basic electrical circuit theory; power, motors, controls, codes, and building distribution systems. Lec/lab.
Prerequisites: CCE 207 with C or better or CEM 407 with C or better

CEM 472. MECHANICAL FACILITIES. (3 Credits)
Principles and applications of mechanical components of constructed facilities; heating, ventilating, air conditioning, plumbing, fire protection, and other mechanical construction.
Prerequisites: CCE 207 with C or better or CEM 407 with C or better

CEM 541. HEAVY CIVIL CONSTRUCTION MANAGEMENT. (4 Credits)
Heavy civil construction management methods. Construction equipment types, capabilities, costs, productivity, and the selection and planning of equipment needed for a project. Soil characteristics, quantity analysis, and movement on construction sites.
Recommended: FE 315 or CE 372

CEM 543. PROJECT MANAGEMENT FOR CONSTRUCTION. (4 Credits)
Project management concepts for construction; concepts, roles and responsibilities, labor relations and supervision, administrative systems, documentation, quality management, and process improvement.
CEM 550. CONTEMPORARY TOPICS IN CONSTRUCTION ENGINEERING MANAGEMENT. (4 Credits)
Contemporary topics of emerging technologies and processes, construction engineering and management, how industry environmental change causes development of new technologies, and the applications of the technologies in the field.

CEM 551. PROJECT CONTROLS. (4 Credits)
Advanced methods of project controls including advanced technologies and methodologies for quality, time, and cost management; project management organization models, and intra-organizational relationships.

CEM 552. RISK MANAGEMENT IN CONSTRUCTION. (4 Credits)
An introduction to the concept of risk in construction projects and construction firms, including risk definition, identification, assessment and management techniques; contractual risk control, sharing and shedding; and contingency management.

CEM 553. CONSTRUCTION BUSINESS MANAGEMENT. (4 Credits)
Introduction to concepts of business structures associated with the construction industry; enterprise-level management techniques; extra-organizational risk management; and operational management structuring.

Counselling (COUN)

COUN 421. PERSONAL GROWTH AND WELLNESS IN THE MODERN WORLD. (3 Credits)
Explores social and emotional adjustment, growth, and wellness within current social contexts. Examines challenges to wellness and the role of normal development, self-help, and the helping professions in the growth process.

COUN 441. INTRODUCTION TO PROFESSIONAL COUNSELING. (3 Credits)
Provides students with an overview of the counseling profession that includes the history and philosophical foundations of the profession and roles and functions of professional counselors. The course content will critically engage the privilege and responsibility of the counseling profession in a multicultural society.

COUN 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 18 credits.

COUN 501. RESEARCH. (1-16 Credits)
Equivalent to: TCE 501
This course is repeatable for 16 credits.

COUN 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 502
This course is repeatable for 16 credits.

COUN 503. THESIS. (1-16 Credits)
Equivalent to: TCE 503
This course is repeatable for 999 credits.

COUN 505. READING AND CONFERENCE. (1-3 Credits)
Equivalent to: TCE 505
This course is repeatable for 16 credits.

COUN 506. PROJECTS. (1-3 Credits)
Equivalent to: TCE 506
This course is repeatable for 16 credits.

COUN 507. SEMINAR. (1-3 Credits)
Equivalent to: TCE 507
This course is repeatable for 16 credits.

COUN 508. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 508
This course is repeatable for 16 credits.

COUN 509. PRACTICUM. (1-16 Credits)
Designed to develop competencies in basic skills, facilitative dimensions, and counseling process. Self-critique, peer-critique, and supervisor-critique of videotaped interview. Written self-critique, oral case presentation and charting skills are learned. Graded P/N.
Equivalent to: TCE 509
This course is repeatable for 16 credits.

COUN 510. INTERNSHIP. (1-18 Credits)
The internship is the culminating field experience of the MS in Counseling program. It is designed to provide students with an on-site placement in a public or private mental health or school setting that will create the necessary bridge between training and professionalism. Students are expected to function per the expectations of other full-time employees and counseling staff at the internship site. Graded P/N.
Equivalent to: TCE 510
This course is repeatable for 16 credits.

COUN 513. COUNSELING PRE-PRACTICUM. (3 Credits)
Designed to develop competencies in basic counseling skills and processes. Self critique, peer critique, and supervisor critique of videotaped interviews with peer clients. A pass requires at least B level work. Graded P/N.
Equivalent to: TCE 513
This course is repeatable for 6 credits.

COUN 514. PRACTICUM IN COUNSELING. (1-3 Credits)
Designed to develop competencies in basic skills, facilitative dimensions, and counseling process. Self-critique, peer-critique, and supervisor-critique of videotaped interview. Written self-critique, oral case presentation and charting skills are learned. A pass requires at least B level work. Graded P/N.
Equivalent to: TCE 514
This course is repeatable for 9 credits.

COUN 515. COUNSELING INTERNSHIP. (1-15 Credits)
The internship is the culminating field experience of the MS in Counseling program. It is designed to provide the student with an on-site placement in a public or private mental health or school setting that will create the necessary bridge between training and professionalism. Graded P/N.
Equivalent to: TCE 515
This course is repeatable for 24 credits.

COUN 530. FUNDAMENTALS OF COUNSELING. (3 Credits)
Exploration of basic helping processes appropriate in a variety of settings. Designed for students planning on working in a human service profession, such as counseling, teaching, nursing, medicine, law. A variety of skills and techniques are demonstrated and practiced through videotape and role play, and review of ethical standards of conduct.
Equivalent to: CSSA 530, TCE 530

COUN 531. DEVELOPMENTAL PERSPECTIVES IN COUNSELING. (3 Credits)
A study of affective, behavioral, cognitive, physical, and moral development for human growth and maturation. Theories of personality and learning that affect normal and non-normal development. Relationship of understanding human development to the counseling profession.
Equivalent to: TCE 531
COUN 532. SOCIAL AND CULTURAL PERSPECTIVES IN COUNSELING. (3 Credits)
Social and cultural factors effecting counseling. Includes studies of change, ethnic groups, subcultures, changing roles of women, sexism, urban and rural societies, population patterns, cultural mores, use of leisure time, and differing life patterns.
Equivalent to: TCE 532

COUN 533. ADDICTIVE BEHAVIOR COUNSELING. (3 Credits)
Techniques for addictive behavior assessment and counseling. Specific addictions covered include substance abuse, gambling, and eating disorders.
Equivalent to: TCE 533

COUN 536. APPLIED PSYCHOPHARMACOLOGY FOR COUNSELORS. (3 Credits)
Acquaints counseling students with the fundamentals of psychotropic drugs. Basics of pharmacology, adverse effects, indications, and drug interactions will be discussed. Boundaries of practice and practical issues of assessment and referral will be covered. The overall aim of the course is to provide information about psychopharmacology to the non-medical mental health care provider so that she or he can be a more informed member of the mental health care team. This course does not purport to prepare the student to be any part of the pharmacological prescriptive process. That is the purview of the medically trained person.
Equivalent to: TCE 536

COUN 540. NEW VISION SCHOOL COUNSELING: ACADEMIC ACHIEVEMENT. (3 Credits)
Participants will be able to implement research-based educational practices in: 1. Individual and group academic achievement counseling. 2. Consulting with parents, teachers, and schools regarding academic achievement. 3. Utilizing culturally competent practices in addressing academic achievement issues. 4. Applying the appropriate legal and ethical guidelines to work in the academic domain.
Equivalent to: TCE 540

COUN 541. THE COUNSELING PROFESSION. (3 Credits)
Provides the foundation for becoming a counselor and explores the psychological and philosophical ramifications of the counselor in a changing world. Topics will include values in counseling, ethical and legal issues in counseling, research in counseling, and maintaining a professional identity.
Equivalent to: TCE 541

COUN 546. LEADERSHIP OF SCHOOL COUNSELING PROGRAMS. (3 Credits)
Designed to prepare school counselors to lead teams in the development and implementation of comprehensive school counseling programs. Principles of leadership, system change, and advocacy are introduced. State and National Comprehensive School Counseling models are examined.
Equivalent to: TCE 546

COUN 548. SPECIAL EDUCATION ISSUES IN COUNSELING. (3 Credits)
Addresses various educational disability categories, the fundamentals of special education law, the special education assessment process, the special education definition of emotional/behavioral disorders, and the counselor’s role in supporting children with special emotional needs.
Equivalent to: TCE 548

COUN 550. FOUNDATIONS OF MENTAL HEALTH COUNSELING. (3 Credits)
Addresses the foundations of mental health counseling: (1) historical, philosophical, societal, cultural, economic, and political dimensions of, and current trends in, the mental health movement; (2) roles, functions, preparation standards, credentialing, licensure and professional identity of mental health counselors, (3) policies, laws, legislation, recognition, reimbursement, right-to-practice, and other issues relevant to mental health counseling.
Equivalent to: TCE 550

COUN 551. THEORY AND TECHNIQUES OF COUNSELING I. (3 Credits)
Basic concepts and facilitative skills of helping relationships. Introduction and overview of counseling theories and their related processes and techniques.
Equivalent to: TCE 551

COUN 552. THEORY AND TECHNIQUES OF COUNSELING II. (3 Credits)
Continued development of the theories and techniques of counseling including identification of the counseling process. Emphasis on personality development and affective, behavioral and cognitive approaches.
Equivalent to: TCE 552
Recommended: COUN 551

COUN 556. INTRODUCTION TO RESEARCH METHODS IN COUNSELING. (3 Credits)
An introductory course for master’s level students. Explains basic evaluation, quantitative and qualitative research methods in the counseling profession; action research and the fundamental statistical procedures used in the interpretation and use of research studies.
COUN 557. APPRAISAL OF THE INDIVIDUAL. (3 Credits)
Development of framework for understanding the individual; methods for data gathering and assessment; individual and group testing; case study approaches; observational, sociometric, and environmental procedures; study of individual differences. Ethnic, cultural, and sex factors are emphasized.
Equivalent to: TCE 557
Recommended: Basic statistics course.

COUN 558. LIFESTYLE AND CAREER DEVELOPMENT. (3 Credits)
Major theoretical approaches to career development; available resources for educational and occupational assessment; procedures to enhance career exploration, planning and placement. Emphasis is on the decision-making process and issues of career counseling with special populations.
Equivalent to: TCE 558

COUN 571. GROUP COUNSELING PROCEDURES. (3 Credits)
A conceptual and experiential introduction to group dynamics. Group counseling approaches and models; issues of group leadership; styles of leadership and group facilitation skills. Consideration is given to group counseling goals, composition, phases and research.
Equivalent to: TCE 571

COUN 575. FAMILY COUNSELING. (3 Credits)
An overview of the major theoretical approaches to family counseling will be covered. Through the use of readings, demonstrations, and videos the student will become familiar with systems foundations, the history of family counseling, family roles, interaction patterns, and decision-making processes.
Equivalent to: TCE 575
COUN 577. APPLIED PSYCHOPATHOLOGY AND PSYCHODIAGNOSTICS. (3 Credits)
Addresses the principles of diagnosis of psychopathology and the use of current diagnostic tools, including the current edition of the Diagnostic and Statistical Manual (DSM). Includes psychiatric terminology, treatment, current research, cross cultural impact, ethical implications, and goal planning related to mental health processes and case management.
Equivalent to: TCE 577
Recommended: COUN 541 and COUN 551 and COUN 552.

COUN 578. CRISIS, TRAUMA, AND GRIEF COUNSELING. (3 Credits)
The theory and pragmatics of crisis, trauma and grief counseling are addressed.
Equivalent to: TCE 578

COUN 579. TRAUMA-INFORMED COUNSELING. (3 Credits)
Trauma-informed counseling methods for promoting client wellness and resilience are addressed.
Prerequisites: COUN 578 with C or better
Recommended: COUN 509

COUN 581. CROSS-CULTURAL COUNSELING. (3 Credits)
Cognitive and experimental study of social and psychological variables influencing the cross-cultural counseling relationship. Social and psychological experiences of selected subcultures. Relevant assessment instruments and current literature, methods and outcome studies.
Equivalent to: TCE 581

COUN 582. MULTICULTURAL COUNSELING II. (3 Credits)
Further explores multicultural counseling by studying in-depth the experience of specific student populations and their unique strengths and needs. Students will gain understanding of the specialized school programs and state and national regulations that support a variety of learners as well as the theories and research related to language acquisition to support ELL and bilingual students in the PK-12 system. Students will engage in authentic experiences and assignments to enrich their understanding of sub-populations of students and their families to enhance their cultural responsiveness with those specific groups of learners.
Prerequisites: COUN 581 with C or better

COUN 591. INSTRUCTIONAL STRATEGIES FOR SCHOOL COUNSELORS. (3 Credits)
Students will gain understanding in research-based classroom teaching practices including classroom planning and evaluation. Students will refine their educational beliefs of classroom practice and gain insight into the administrative structure of public schools as it relates to the teacher and school counselor.
Equivalent to: TCE 591

COUN 592. CLASSROOM INSTRUCTION FOR COUNSELORS. (3 Credits)
75 hours of supervised instruction in a public school setting.
Equivalent to: TCE 592
Recommended: COUN 591.

COUN 595. GROUP COUNSELING II. (3 Credits)
Group counseling theories and pragmatics for clients with mental and emotional disorders.
Equivalent to: TCE 595

COUN 597. INTRODUCTION TO COUNSELOR SUPERVISION. (3 Credits)
Introduction to the theory and pragmatics of counselor supervision.
Equivalent to: TCE 597

COUN 598. COUNSELOR CONSULTATION. (3 Credits)
Development of consultation skills as a supervisor and counselor educator. Consultation theory and practice are studied. Students practice consultation skills and receive feedback.
Equivalent to: TCE 598

COUN 599. SPECIAL TOPICS. (1-4 Credits)
Equivalent to: TCE 599
This course is repeatable for 90 credits.

COUN 601. RESEARCH. (1-16 Credits)
Equivalent to: TCE 601
This course is repeatable for 16 credits.

COUN 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 602
This course is repeatable for 16 credits.

COUN 603. THEESIS. (1-16 Credits)
Equivalent to: TCE 603
This course is repeatable for 999 credits.

COUN 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: TCE 605
This course is repeatable for 16 credits.

COUN 606. PROJECTS. (1-16 Credits)
Equivalent to: TCE 606
This course is repeatable for 16 credits.

COUN 607. SEMINAR. (1-16 Credits)
Equivalent to: TCE 607
This course is repeatable for 16 credits.

COUN 608. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 608
This course is repeatable for 16 credits.

COUN 609. PRACTICUM IN COUNSELING. (1-12 Credits)
Specialized counseling experiences supervised by a professional. Emphasis is on development of advanced skills in counseling specific to a population.
Equivalent to: TCE 609
This course is repeatable for 16 credits.

COUN 610. INTERNSHIP IN COUNSELING. (1-15 Credits)
Designed to provide experiences in development of teaching and supervision skills in preparation as a counselor educator and supervisor.
Equivalent to: TCE 610
This course is repeatable for 15 credits.

COUN 612. RESEARCH PERSPECTIVES IN EDUCATION. (3 Credits)
Research perspectives, how they are influenced by worldviews, and how these worldviews influence research.
Equivalent to: TCE 612
Recommended: COUN 562 and completion or concurrent enrollment in an introductory statistics course

COUN 613. RESEARCH ANALYSIS AND INTERPRETATION IN EDUCATION. (3 Credits)
Critical analysis of scholarly studies in education from a variety of research perspectives.
Equivalent to: TCE 613
Recommended: (TCE 612 or COUN 612) and completion or concurrent enrollment in an intermediate statistics course
COUN 614. ADVANCED RESEARCH METHODS IN EDUCATION. (1-3 Credits)
Selected topics in research methods as appropriate for research perspectives in education.
Equivalent to: TCE 614
This course is repeatable for 6 credits.
Recommended: COUN 613

COUN 616. UNIVERSITY LEVEL INSTRUCTIONAL THEORY AND METHODS. (3 Credits)
Addresses general university level instructional theory and methods as well as pedagogy specific to counselor education.
Equivalent to: TCE 616

COUN 617. ADVANCED COUNSELOR SUPERVISION. (3 Credits)
Advanced theory and techniques in counselor supervision. Pedagogical issues in training supervisors are addressed.
Equivalent to: TCE 617

COUN 618. PRACTICUM IN COUNSELING. (1-12 Credits)
Specialized counseling experiences supervised by a professional. Emphasis is on development of advanced skills in counseling specific to a population.
Equivalent to: TCE 618
This course is repeatable for 16 credits.

COUN 619. INTERNSHIP IN COUNSELING. (1-12 Credits)
Designed to provide experiences in development of teaching and supervision skills in preparation as a counselor educator and supervisor.
Equivalent to: TCE 619
This course is repeatable for 16 credits.

COUN 621. ADVANCED TOPICS IN EDUCATION. (3 Credits)
Advanced critical study of theory and research related to specific topics of counseling and counselor education.
Equivalent to: TCE 621
This course is repeatable for 18 credits.

COUN 632. ADVANCED COUNSELING THEORY. (3 Credits)
The goal of this course is to develop in each student an advanced level of understanding and skill in emergent counseling models.
Equivalent to: TCE 632

COUN 633. ADVANCED COUNSELING PRACTITIONER I. (3 Credits)
Assists the advanced counseling practitioner with their knowledge and skills in training, leadership, and writing.
Equivalent to: TCE 633

COUN 634. ADVANCED COUNSELING PRACTITIONER II. (3 Credits)
Addresses the theory, science, pragmatics and pedagogy of evidence-based practices in professional counseling.
Equivalent to: TCE 634

COUN 662. COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS I. (3 Credits)
Part I of a three-course sequence designed to prepare students to meet the CACREP doctoral standards for quantitative research methods in counselor education. Topics addressed in course I include application of the following in counselor education research: (1) data scales and scale transformation, (2) frequency distributions and histograms, (3) measures of central position, (4) variability, (5) characteristics of data curves, (6) normality, (7) measures of variability, (8) the statistical hypothesis, (9) statistical errors (Type I/Type II), (10) power analysis, and (11) statistical correlation.
Equivalent to: TCE 662
Recommended: COUN 562.

COUN 663. COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS II. (3 Credits)
Part II of a three-part course sequence designed to prepare students to meet the CACREP doctoral standards for quantitative research methods in counselor education. Topics addressed in course II include application of the following in counselor education research: (1) a review of the dependent variable, normal curve, Type I and Type II errors, power analysis, and criteria for selecting statistical tools, (2) significance tests, including Chi-square t-test, one-factor analysis of variance, multiple comparison tests (L.S.D. and Tukey's HSD), two-factor analysis of variance, statistical interaction (ordinal and disordinal), linear regression, factor analysis, and analysis of covariance.
Equivalent to: TCE 663

COUN 664. COUNSELOR EDUCATION QUANTITATIVE RESEARCH METHODS III. (3 Credits)
Part III of a three-course sequence designed to prepare students to meet the CACREP doctoral standards for quantitative research methods in counselor education. Topics addressed in course III include application of the following in counselor education research: (1) multiple regression, (2) path analysis, (3) confirmatory factor analysis, analysis, (4) logistic regression, (5) reliability and generalizability theory, (6) cluster analysis, (7) structural equation modeling, and (8) single subject designs.
Equivalent to: TCE 664

COUN 665. PUBLICATION METHODS IN COUNSELOR EDUCATION. (3 Credits)
Teaches doctoral students how to write theses, grant reports, peer-reviewed journal articles, and textbook chapters.
Equivalent to: TCE 665

COUN 667. ADVANCED ASSESSMENT IN COUNSELING. (3 Credits)
Explores current issues in the use of assessment in counseling, best practices in instrument development, and best practices in assessment pedagogy.
Equivalent to: TCE 667

COUN 668. ADVANCED CAREER DEVELOPMENT AND CONSULTATION IN COUNSELING. (3 Credits)
An advanced course surveying past, current, and possible future technical and philosophical perspectives concerning career development and counseling. Issues in consultation, social change theory, and advocacy action planning are also reviewed in light of their impact on future counseling practitioners. Pedagogical methods for presenting current issues in career development, consultation, social change theory and advocacy action planning are a major focus of the class.
Equivalent to: TCE 668
Recommended: COUN 568 and COUN 598.

COUN 671. ADVANCED GROUP COUNSELING. (3 Credits)
Provides learning experiences beyond the entry level in group counseling. Theoretical and pedagogical innovations in this area are discussed.
Equivalent to: TCE 671

COUN 681. ADVANCED DIVERSITY AND SOCIAL JUSTICE IN COUNSELOR EDUCATION. (3 Credits)
Addresses pedagogy relevant to multicultural, diversity, and social justice issues and the role of racial, ethnic, and cultural heritage, nationality, socioeconomic status, family structure, age, gender, sexual orientation, religious and spiritual beliefs, occupation, physical, and mental status, local, regional, national, international perspective, and issues of equity such as oppression, power and privilege in counselor education.
Equivalent to: TCE 681
Recommended: COUN 581
COUN 696. COUNSELOR EDUCATION. (3 Credits)
Orientation to the profession of counselor education. Specific topics include: (1) history and organization of the profession, (2) program accreditation standards and practices, (3) instructional theory and methods relevant to counselor education, and (4) ethical and legal considerations in counselor education.
Equivalent to: TCE 696

COUN 697. COUNSELOR SUPERVISION. (3 Credits)
Practical experience for counseling professionals who have responsibility directing personal and professional development of counselors, promoting counselor competency, and developing and implementing counseling services and programs. Theoretical models of supervision are utilized to develop supervisor roles.
Equivalent to: TCE 697

Crop Science (CROP)

CSS 205. *SOIL SCIENCE. (4 Credits)
Introduction to the chemical, physical, and biological nature of soils. Examines the functions of soil as a medium for plant growth, a recycling system for nutrients and wastes, a modifier of atmospheric chemistry, a habitat for soil organisms, a system for water purification, and an engineering medium. Field and laboratory projects provide an understanding of fundamental soil science principles and the impact of human activities on soil quality and sustainability. Lec/lab. (Bacc Core Course) Taught via Ecampus only.
Attributes: CPBS – Core, Pers, Biological Science; CPPS – Core, Pers, Physical Science
Equivalent to: CSS 305, SOIL 205

CSS 305. PRINCIPLES OF SOIL SCIENCE. (4 Credits)
Origin, formation, classification, physical, chemical, and biological characteristics; ecosystem functions of soils; effects of soil management on agricultural and forest crop production. Field trips. Taught at EOU LaGrande campus only.
Equivalent to: CSS 205, SOIL 205
Recommended: Two quarters of college chemistry and CSS 306

CSS 306. PROBLEM SOLVING: SOIL SCIENCE APPLICATIONS. (1 Credit)
Problem solving for, and in-depth exploration of, Principles of Soil Science (CSS 305). Real-world problems requiring knowledge of soil physical, chemical, and biological properties. Taught at EOU LaGrande campus only.
Corequisites: CSS 305

CSS 315. *NUTRIENT MANAGEMENT AND CYCLING. (4 Credits)
Nutrient forms, transformations, and plant availability as influenced by chemical and biological reactions in soils; soil pH and management of acid and alkaline soils; characteristics and use of fertilizers, soil amendments and organic wastes. Labs include routine soil testing procedures, computer applications for soil fertility management, and field trips. Lec/lab. (Writing Intensive Course) Taught at EOU LaGrande campus only.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: CSS 305 with D- or better
Recommended: CH 122 and courses in computers

CSS 320. PRINCIPLES OF OIL AND FIBER CROP PRODUCTION. (1 Credit)
An overview of production practices and characteristics of oil seed, essential oil, and fiber crops. Taught at EOU LaGrande campus only.
Recommended: CSS 300 and CSS 305

CSS 321. PRINCIPLES OF CEREAL CROP PRODUCTION. (1 Credit)
An overview of the principles underlying small grain production practices in the Pacific Northwest. Taught at EOU LaGrande campus only.
Recommended: CSS 300 and CSS 305

CSS 322. PRINCIPLES OF POTATO PRODUCTION. (1 Credit)
Principles and practices governing all aspects of potato production, storage and use. Taught at EOU LaGrande campus only.
Recommended: CSS 300 and CSS 305
CROP 310. FORAGE PRODUCTION. (4 Credits)
Importance of, and current production practices for, forage crops. Lec/lab.
Equivalent to: CSS 310
Recommended: (CSS 300 or CROP 300 or HORT 300) and (CSS 305 or CSS 205 or SOIL 205)
CROP 319. PRINCIPLES OF FIELD CROP PRODUCTION. (3 Credits)
Provides students with an understanding of the basic principles of field crop production—tilage, soil testing, fertilization, variety selection, planting, and in-season crop management. Management practices for wheat, corn and soybean as . 
Recommended: CROP 280 and SOIL 205
CROP 330. *WORLD FOOD CROPS. (3 Credits)
Origin, production, utilization, and improvement of the world's major food crops. The role of crop production in global economic and social development; food security and worldwide nutritional requirements. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: CSS 330
Recommended: CSS 200 or CROP 200
CROP 340. *PENS AND PLOWS: WRITINGS OF WORKING THE LAND. (3 Credits)
A survey of literature from ancient Greece to the twentieth century focusing on the significance of agricultural life and/or the natural world. Students read and discuss writings considered critical in the development of Western culture and receive input on the literary significance and the accuracy of agriculture presented within the readings. (Bacc Core Course) Taught via Ecampus only.
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: CSS 340
CROP 355. ORGANIC CERTIFICATION. (3 Credits)
Learn about the USDA National Organic Program (NOP) standards relating to certified operations, inspection, certification processes, and labeling. Focus on the crops, processing, and livestock aspects of organic certification for farms and food manufacturing operations.
CROP 401. RESEARCH. (1-16 Credits)
Equivalent to: CSS 401
This course is repeatable for 16 credits.
CROP 403. THESIS. (1-16 Credits)
Independent, original study and preparation of a senior thesis.
Equivalent to: CSS 403
This course is repeatable for 16 credits.
CROP 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CROP 405H, CSS 405
This course is repeatable for 16 credits.
CROP 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: CROP 405, CSS 405H
This course is repeatable for 16 credits.
CROP 407. SEMINAR. (1 Credit)
Senior seminar intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and to submit written documentation supporting that seminar.
Equivalent to: CSS 407
CROP 410. INTERNSHIP. (1-6 Credits)
Professional work experience previously approved and supervised by the department, written report required.
Equivalent to: CSS 410
This course is repeatable for 12 credits.
CROP 414. PRECISION AGRICULTURE. (4 Credits)
Provides insight into the technology available to support precision agriculture and data management planning applications. Examines the concepts and applications of precision agriculture to teach practical use of hardware, equipment and software. An overview of current technology including autonomous vehicles, GPS, soil and crop proximal sensors, imagery and mapping, variable rate control systems, and yield monitors. Lec/lab. CROSSLISTED as CROP 414/HORT 414.
Equivalent to: HORT 414
CROP 418. TOXIC PLANTS IN PNW PASTURES. (1 Credit)
Identifying and understanding ecology and biology of harmful weeds and poisonous plants found in Pacific Northwest pastures and rangelands and determining best management and control options. Taught via Ecampus only.
Equivalent to: CSS 418
Recommended: College-level plant biology and/or taxonomy courses.
CROP 420. SEED SCIENCE AND TECHNOLOGY. (3 Credits)
Seed formation and factors affecting their development and maturation. Seed structure and chemical composition. Physiological and biochemical aspects of seed germination, dormancy, deterioration and storability. The concept of seed quality, its importance in agriculture, its attributes and impact on field performance. Methods of measuring seed quality of conventional and genetically modified seeds. Taught via Ecampus only.
Equivalent to: CSS 420
Recommended: Biology, plant anatomy and/or physiology courses
CROP 433. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years. CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Prerequisites: BI 102 with D- or better or BI 213 with D- or better or BI 311 with D- or better or HORT 430 with D- or better or CSS 430 with D- or better or PBG 430 with D- or better or HORT 450 with D- or better or CSS 450 with D- or better or PBG 450 with D- or better
Equivalent to: CSS 433, HORT 433
CROP 440. WEED MANAGEMENT. (4 Credits)
Principles of weed control by cultural, biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use. Lec/lab/rec.
Equivalent to: CSS 440
Recommended: One year biological science and one course in organic chemistry.
CROP 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 448, RNG 448
CROP 460. SEED PRODUCTION. (3 Credits)
Equivalent to: CSS 460
Recommended: CROP 200 or CSS 200

CROP 463. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: HORT 463

CROP 470. OILSEEDS AND ESSENTIAL OIL CROPS. (3 Credits)
Provides students with an understanding of the principles and the latest research information of field crop production, chemistry, oil extraction and utilization of OEC. Includes the importance of OEC, their uses, current trends, production systems for major crops, harvesting, drying, processing, and other post-harvest operations, fixed (fatty acid) and essential oil extraction methods, and oil utilization. Relevant recent research and review papers will be also included and the information discussed and assessed.
Prerequisites: CROP 200 with D- or better

CROP 480. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: HORT 480
Recommended: CROP 300 or HORT 300

CROP 499. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (1-16 Credits)
Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Equivalent to: CROP 499H, CSS 499
This course is repeatable for 16 credits.

CROP 499H. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (1-16 Credits)
Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Attributes: HNRS – Honors Course Designator
Equivalent to: CROP 499H, CSS 499H
This course is repeatable for 16 credits.

CROP 501. RESEARCH. (1-16 Credits)
Equivalent to: CSS 501
This course is repeatable for 16 credits.

CROP 503. THESIS. (1-16 Credits)
Equivalent to: CSS 503
This course is repeatable for 999 credits.

CROP 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSS 505
This course is repeatable for 16 credits.

CROP 506. PROJECTS. (1-16 Credits)
 Equivalent to: CSS 506
This course is repeatable for 16 credits.

CROP 507. SEMINAR. (1 Credit)
Graded P/N.
Equivalent to: CSS 507
This course is repeatable for 99 credits.

CROP 509. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/PBG 509/SOIL 509.
Equivalent to: CROP 509, ENT 509, PBG 509, SOIL 509
This course is repeatable for 9 credits.

CROP 514. PRECISION AGRICULTURE. (4 Credits)
Provides insight into the technology available to support precision agriculture and data management planning applications. Examines the concepts and applications of precision agriculture to teach practical use of hardware, equipment and software. An overview of current technology including autonomous vehicles, GPS, soil and crop proximal sensors, imagery and mapping, variable rate control systems, and yield monitors. Lec/lab.

CROP 520. SEED SCIENCE AND TECHNOLOGY. (3 Credits)
Seed formation and factors affecting their development and maturation. Seed structure and chemical composition. Physiological and biochemical aspects of seed germination, dormancy, deterioration and storability. The concept of seed quality, its importance in agriculture, its attributes and impact on field performance. Methods of measuring seed quality of conventional and genetically modified seeds. Taught via Ecampus only.
Equivalent to: CSS 520
Recommended: Biology, plant anatomy and/or physiology courses

CROP 530. ORGANIC SOIL AND CROP MANAGEMENT. (3 Credits)
Overview of organic soil and crop management, organic soil system management, soil microbiology under organic systems, cropping systems, organic cereal production systems, organic forage production system, organic horticultural systems management, organic field and horticulture cropping systems; recent research and case studies. CROSSLISTED as CROP 530/SOIL 530.
Equivalent to: SOIL 530
Recommended: SOIL 525, CROP 200, SOIL 205 or introductory biology. Completion or concurrent enrollment in AGRI 520

CROP 533. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years. CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Equivalent to: CSS 533, HORT 533
Recommended: BI 102 or BI 213 or BI 311 or HORT 430 or CSS 430 or PBG 430 or HORT 450 or CSS 450 or PBG 450
CROP 540. WEED MANAGEMENT. (4 Credits)
Principles of weed control by cultural, biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use. Lec/lab/rec.
Equivalent to: CSS 540
Recommended: One year biological science and one course in organic chemistry.

CROP 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSTLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 548, RNG 548

CROP 560. SEED PRODUCTION. (3 Credits)
Equivalent to: CSS 560
Recommended: CROP 200 or CSS 200

CROP 563. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSTLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: HORT 563

CROP 570. OILSEEDS AND ESSENTIAL OIL CROPS. (3 Credits)
Provides students with an understanding of the principles and the latest research information of field crop production, chemistry, oil extraction and utilization of OEOC. Includes the importance of OEOC, their uses, current trends, production systems for major crops, harvesting, drying, processing, and other post-harvest operations, fixed (fatty acid) and essential oil extraction methods, and oil utilization. Relevant recent research and review papers will be also included and the information discussed and assessed.
Prerequisites: CROP 200 with D- or better
Recommended: Horticulture, biology or chemistry course

CROP 580. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSTLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: HORT 580
Recommended: CROP 300 or HORT 300

CROP 590. EXPERIMENTAL DESIGN IN AGRICULTURE. (4 Credits)
Field layout, analysis, and interpretation of basic experimental designs used in agronomy and plant breeding and including field plot techniques such as optimum plot size and shape, factorial arrangement, replication, sub-sampling, randomization, and blocking. Recitation provides practical experience with SAS. Lec/rec.
Equivalent to: CSS 590
Recommended: ST 351

CROP 599. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (0-16 Credits)
Technical knowledge and skills development courses offered in a wide variety of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Equivalent to: CSS 599
This course is repeatable for 16 credits.

CROP 601. RESEARCH. (1-16 Credits)
Equivalent to: CSS 601
This course is repeatable for 16 credits.

CROP 603. THESIS. (1-16 Credits)
Equivalent to: CSS 603
This course is repeatable for 999 credits.

CROP 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: CSS 605
This course is repeatable for 16 credits.

CROP 606. PROJECTS. (1-16 Credits)
Equivalent to: CSS 606
This course is repeatable for 16 credits.

CROP 607. SEMINAR. (1 Credit)
Graded P/N.
Equivalent to: CSS 607
This course is repeatable for 99 credits.

CROP 608. WORKSHOP. (1-16 Credits)
Equivalent to: CSS 608
This course is repeatable for 16 credits.

CROP 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: ENT 609, PBG 609, SOIL 609
This course is repeatable for 9 credits.

CROP 660. HERBICIDE SCIENCE. (4 Credits)
Absorption, movement, and mechanism of action in plants; behavior of herbicides in soil. Offered alternate years.
Recommended: BOT 331 and (CSS 440 or CSS 540 or CROP 440 or CROP 540)

CROP 670. PHYSIOLOGY OF CROP YIELD. (3 Credits)
Concepts of crop growth and production in relation to environmental and physiological factors and their interactions; current literature.
Equivalent to: CSS 670
Recommended: BOT 331

CROP 699. SPECIAL TOPICS IN CROP SCIENCE AND SOIL SCIENCE. (1-16 Credits)
Equivalent to: CSS 699
This course is repeatable for 16 credits.
Design (DSGN)

DSGN 121. COMPUTER AIDED DESIGN. (3 Credits)
Introduction to the Adobe Creative Suite: Illustrator and Photoshop. Instruction in drawing, image editing, flat illustrations and textile design. Lec/studio.
Equivalent to: DSGN 221

DSGN 199. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 12 credits.

DSGN 226. SPECIFICATION BUYING. (4 Credits)
Introduction to terminology, assembly process, quality factors, and costs in the development of sewn product specifications. Lec/lab.

DSGN 244. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Equivalent to: DSGN 244H

DSGN 244H. COLOR INNOVATION. (4 Credits)
The aesthetics, meaning, and perception of color provide the foundational knowledge in this course.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 244

DSGN 253. PROFESSIONAL DEVELOPMENT. (3 Credits)
This course is designed to give you an early start on the process of career planning and development. The process involves thoughtful self-assessment, career exploration, planning and follow-through with preliminary employment strategies. The philosophy of this course is that the career management process is ongoing, systematic, and aimed towards a fulfilling work life, which is part of your overall plan for personal development.
Prerequisites: BA 101 with C- or better or (BA 162 with C- or better or BA 162H with C- or better)
Equivalent to: BA 253, BA 253H, BA 281, BA 281H, BA 291, BA 294, BA 295, BA 353, BA 381, BA 382, BA 384, BA 385

DSGN 255. TEXTILES. (4 Credits)
Equivalent to: DHE 255

DSGN 276. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Provides the introductory knowledge necessary to prepare students for working in the retail industry. Introduces students to the retail industry including basic terminology, industry history, and to merchandising management decisions. Prepares students for more advanced knowledge acquired in the Merchandising Management concentration.
Equivalent to: DHE 276

DSGN 281. DRAWING AND SKETCHING. (4 Credits)
Designed for both beginning drawers and those wanting to improve their skills. Focuses exclusively on hand drawing skills with an emphasis on technical drawing skills, observational and perspective drawing, as well as imagination and creativity. Students develop a working knowledge of visual methods for communicating design concepts. Class format includes a combination of quick drawing activities, demonstrations, lectures, critiques, and work time on drawing assignments. Throughout the term students are introduced to the drawings of several prominent designers and artists.
Equivalent to: DHE 281

DSGN 282. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT I. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 282

DSGN 283. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT II. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 283

DSGN 284. PERSONAL, PROFESSIONAL, AND LEADERSHIP DEVELOPMENT III. (1 Credit)
DSGN 282 – DSGN 284 is a series of three one-credit courses taken during the students’ second year. Helps students develop lifelong skills that are practical, meaningful, and useful. These skills and the understanding developed through this course strengthens the student’s ability to adapt career goals to changing market conditions, make good decisions in difficult situations, and set financial goals.
Prerequisites: BA 101 with C- or better or BA 162 with C- or better or BA 162H with C- or better
Equivalent to: BA 284

DSGN 287. STUDIO I: DESIGN COMMUNICATION. (4 Credits)
Focuses on design communication through electronic media. Students use AutoCAD, SketchUp, and the Adobe Creative Cloud to create 2D and 3D visualizations and presentations of interiors. Lec/studio.
Equivalent to: DHE 287

DSGN 311. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP I. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 311
DSGN 312. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 312

DSGN 313. THIRD YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III. (1 Credit)
DSGN 311 – DSGN 313 is a series of three one-credit courses taken during the third year. These courses, along with the respective 2nd to 4th year one-credit courses, are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the third year series provides students with an in-depth exploration and development of skills related to team work and team leadership. DSGN 311 focuses on Diversity and Inclusion; DSGN 312 focuses on Teamwork; and DSGN 313 focuses on Team Leadership.
Equivalent to: BA 313

DSGN 327. PERFORMANCE APPAREL INNOVATION I. (4 Credits)
Develop innovative performance apparel from technical specifications or prototypes. Analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/lab.
Prerequisites: DSGN 226 with C- or better
Equivalent to: DHE 327

DSGN 328. DIGITAL DESIGN FOR APPAREL. (3 Credits)
Computer-aided flat pattern, grading and marker techniques using industry relevant pattern development software.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 328

DSGN 329. SPORTSWEAR INDUSTRY COLLABORATION. (3 Credits)
Industry lead team project. Creation of briefs, sketch, pattern, design textile prints, construct prototypes based on identified consumer and company.
Prerequisites: DSGN 327 with C- or better

DSGN 330. FASHION FORECASTING AND MARKET ANALYSIS. (4 Credits)
Forecasting and market analysis processes applied to fashion goods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WR 222 with C- or better or WR 323 with C- or better or WR 327 with C- or better
Equivalent to: DHE 330

DSGN 333. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men’s and women’s apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: DHE 233, DHE 463

DSGN 335. APPAREL AND FOOTWEAR VALUE CHAIN. (3 Credits)
Survey of the structure, functions, and current trends within the apparel and footwear value chain.

DSGN 341. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Equivalent to: DSGN 341H

DSGN 341H. DESIGN THINKING AND PROCESS INNOVATION. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context. Application of design thinking principles to identify and develop solutions to improve consumer experience within a given context.
Attributes: HNRS – Honors Course Designator
Equivalent to: DSGN 341

DSGN 342. INTRODUCTION TO DESIGN MANAGEMENT. (4 Credits)
Introduces the foundations and concepts of design strategy and creative development.
Prerequisites: DSGN 341 with C- or better

DSGN 343. IDEA VISUALIZATION. (4 Credits)
Focuses on the design process through visual communication of ideation and sketching.
Prerequisites: DSGN 342 with C- or better

DSGN 352. TEXTILES FOR INTERIORS. (4 Credits)
Types, qualities, and maintenance of functional and decorative fabrics for homes and public buildings. Use of specifications, standards, and legislation.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Equivalent to: DHE 352

DSGN 355. SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS. (4 Credits)
Specification of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance. Lec/lab.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Equivalent to: DHE 355

DSGN 356. SPECIFICATION AND EVALUATION OF PERFORMANCE MATERIALS. (3 Credits)
Specification of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance.
Prerequisites: DSGN 255 with C- or better

DSGN 357. EVALUATION OF PERFORMANCE MATERIALS LABORATORY. (1 Credit)
Evaluation of materials for athletic and outdoor apparel to enhance human comfort, safety, and performance.
Prerequisites: DSGN 255 with C- or better and DSGN 327 [C-]
Corequisites: DSGN 356
 Recommended: Concurrent enrollment with DSGN 356

DSGN 372. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles.
Prerequisites: DSGN 276 with C or better
Equivalent to: DSGN 472

DSGN 377. RETAIL AND MERCHANDISING. (4 Credits)
Evaluation of performance within the merchandising functions of an organization. Development of merchandising plans based on quantitative and qualitative analysis, as well merchandising principles.
Prerequisites: DSGN 372 with C- or better or DSGN 472 with C- or better
DSGN 383. BUILDING CONSTRUCTION AND MATERIALS. (3 Credits)
An introduction to the manufacture, characteristics, sustainability, and use of construction materials in commercial and residential construction.
Equivalent to: DHE 283

DSGN 387. STUDIO III: ADVANCED DESIGN COMMUNICATION. (4 Credits)
Development of presentation and Building Information Modeling (BIM) skills through various computer programs including Adobe Illustrator, Adobe PhotoShop, Sketchup, and Revit Architecture. In-class exercises and take-home assignments.
Prerequisites: DSGN 287 with C- or better
Equivalent to: DHE 387

DSGN 388. STUDIO IV: HOSPITALITY DESIGN. (4 Credits)
Study and design of hospitality spaces in compliance with building codes and industry standards, with emphasis on sustainability, safety, and cultural context.
Prerequisites: DSGN 387 with C- or better
Equivalent to: DHE 388

DSGN 394. STUDIO V: LIGHTING DESIGN. (4 Credits)
Lighting design and documentation for residential and small commercial projects. The commercial projects include space planning and lighting design for workspace and retail environments. Lec/Studio.
Prerequisites: DSGN 388 with C- or better or DHE 388 with C- or better
Equivalent to: DHE 394

DSGN 403. THESIS. (1-16 Credits)
Equivalent to: DHE 403
This course is repeatable for 16 credits.

DSGN 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: DHE 405
This course is repeatable for 16 credits.

DSGN 406. PROJECTS. (1-16 Credits)
Equivalent to: DHE 406
This course is repeatable for 16 credits.

DSGN 407. SEMINAR. (1-16 Credits)
Equivalent to: DHE 407
This course is repeatable for 16 credits.

DSGN 408. WORKSHOP. (1-16 Credits)
Equivalent to: DHE 408
This course is repeatable for 16 credits.

DSGN 409. PRACTICUM. (1-16 Credits)
Equivalent to: DHE 409
This course is repeatable for 16 credits.

DSGN 410. DESIGN INTERNSHIP. (1-6 Credits)
Planned and supervised work experience at selected cooperating business firms. Supplementary training, conference, reports, and appraisals. Graded P/N.
Equivalent to: DHE 410
This course is repeatable for 16 credits.

DSGN 411. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOPMENT. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment.
DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 411

DSGN 412. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP II. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment.
DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 412

DSGN 413. FOURTH YEAR PERSONAL, PROFESSIONAL, & LEADERSHIP DEVELOP III. (1 Credit)
DSGN 411 – DSGN 413 is a series of three one-credit courses taken during your fourth year. These courses along with the respective 2nd and 3rd year one-credit courses are designed to help you successfully navigate college and develop lifelong skills that are practical, meaningful and useful. These courses revolve around personal, professional and leadership development, and the fourth year series continue to provide students with career-related skills as they seek out full-time employment.
DSGN 411 focuses on career placement skills; DSGN 412 focuses on self-leadership; and DSGN 413 focuses on work-life balance, financial literacy, and networking.
Equivalent to: BA 413

DSGN 422. DHE FASHION SHOW AND DESIGN EXHIBITION. (1-16 Credits)
Special topics in design and human environment.
Equivalent to: DHE 422
This course is repeatable for 16 credits.

DSGN 427. PERFORMANCE APPAREL INNOVATION II. (4 Credits)
Develop innovative performance apparel from technical specifications or prototypes. Analysis of apparel construction related to equipment, cost, quality, end use and customer needs. Lec/lab.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 427

DSGN 428. TECHNICAL SPORTSWEAR SIZING AND FIT. (4 Credits)
Development of sizing and grading systems used in sportswear and evaluation of garment fit by use of virtual and physical prototypes.
Prerequisites: DSGN 327 with C- or better
Equivalent to: DHE 428
DSGN 429. FUNCTIONAL DESIGN AND PRODUCT DEVELOPMENT. (4 Credits)
Design processes and research methods used to create functional designs. Students will identify design problems and develop design brief and functional product line for identified target company. Lec/lab.
Prerequisites: DSGN 428 with C- or better
Equivalent to: DHE 429

DSGN 440. DESIGN RESEARCH. (4 Credits)
Surveys design principles, methods and applications in business outcomes. Application of design research is investigated and analyzed in group projects.
Prerequisites: DSGN 343 with C- or better

DSGN 441. SERVICE DESIGN INNOVATION. (4 Credits)
Focuses on the impact that service design has on business enterprises. Creative ideation, critical analysis, and innovative thinking are integrated as foundations for service design outcomes.
Prerequisites: DSGN 440 with C- or better

DSGN 442. MATERIALITY AND MAKING FIELD PROJECT. (4 Credits)
Focuses on material properties and specifications. Students work in the makerspace to design product outcomes.
Prerequisites: DHE 440 with C- or better or DSGN 440 with C- or better
Equivalent to: DHE 442

DSGN 464. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of interior design from the mid-19th century to the present.
Prerequisites: ART 204 with C- or better or ART 205 with C- or better or ART 206 with C- or better
Equivalent to: DHE 464

DSGN 471. RETAIL PRESENTATION STRATEGIES. (4 Credits)
Provides an overview of, and examines competitive presentation strategies within, retail environments and channels (e.g., in-store, catalog, online, mobile) by integrating the principles and elements of design with sensory marketing.
Prerequisites: DSGN 377 with C- or better and (BA 390 [C-] or BA 390H [C-] or BA 223 [C-] or BA 223H [C-] or MRKT 390 [C-])

DSGN 473. RETAIL STRATEGIES PRACTICUM. (4 Credits)
Explores the role that retail strategies play within a value delivery network. Looks at how retailing helps deliver value created in manufacturing and in services. Examines how these organizations develop strategies to attract consumers and also how consumers develop strategies to acquire goods and services from retailers. Provides a foundation for students who plan to work in retailing or related disciplines.
Prerequisites: DSGN 377 with C- or better

DSGN 475. *GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR. (4 Credits)
Trade theory and the effects of trade policy, cultural values, and economics on the global production, distribution, and consumption of textiles, apparel, and footwear. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: DHE 475

DSGN 488. STUDIO VI: HEALTHCARE DESIGN. (4 Credits)
Interior design project development with emphasis on healthcare design, contract documents, and building codes.
Prerequisites: DSGN 394 with C- or better or DHE 394 with C- or better
Equivalent to: DHE 488

DSGN 495. STUDIO VII: SENIOR THESIS II. (4 Credits)
Individual design project development of programming document and construction drawings.
Prerequisites: DSGN 488 with C- or better
Equivalent to: DHE 495

Design and Human Environment (DHE)

DHE 160. DESIGN PERSPECTIVES. (4 Credits)
Overview of how design reflects and shapes social, cultural, and temporal values and contexts across many different areas of design specialization. Areas to be explored include design processes, principles, and problem solving.

DHE 161. DESIGN EXPLORATIONS. (4 Credits)
Introduction to principles and theories of design through iterative development and making of project work. Topics include basic design terminology, design principles, and materiality. Lec/studio.
Prerequisites: DHE 160 with C- or better

DHE 170. INTRODUCTION TO THE TEXTILE AND APPAREL INDUSTRY. (4 Credits)
Overview of industry sectors involved in the planning, creation, production, merchandising, distribution, and consumption of textile, apparel, and related products. Overview of various career options within the industry.

DHE 180. INTRODUCTION TO SINGLE FAMILY HOUSING. (3 Credits)
Critical examination of single family housing. Considers space planning fundamentals. Introduces construction principles and methods. Develops a working knowledge of methods used to communicate architectural ideas.
Equivalent to: AIHM 180

DHE 181. INTRODUCTION TO INTERIOR DESIGN. (3 Credits)
Introduction to the interior design profession including space planning fundamentals, design process, color, sustainability, and human-centered design.

DHE 187. INTRODUCTION TO DESIGN COMMUNICATION. (0-3 Credits)
Fundamentals of design communication including drafting, lettering, illustrative sketching, perspective, and orthographic projections. Lec/ studio.
Prerequisites: DHE 180 with C- or better

DHE 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 227. APPAREL DESIGN AND PRODUCTION 1. (4 Credits)
Terminology, construction techniques and processes used to produce apparel. Development of production patterns and specifications with analysis of apparel construction related to equipment, cost, quality, end use and customer needs.
Equivalent to: AIHM 227

DHE 233. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Examination of fashion change in apparel from 1890 to the present. Recognition of style variations. Influence of socio-cultural factors.
Prerequisites: DHE 170 with C- or better
Equivalent to: DHE 463
DHE 242. INTRODUCTION TO SOFTGOODS MERCHANDISING. (4 Credits)
Overview of merchandising functions within the apparel industry, as well as how these functions interact with industry sectors involved in the planning, creation, production, distribution, and sale of apparel and related products. Wholesale and retail assortment planning. Basic merchandising mathematics. Excel skill development.
Equivalent to: DHE 271, DHE 276

DHE 262. HUMAN-CENTERED RESEARCH IN DESIGN AND MERCHANDISING. (4 Credits)
Application of a qualitative, multi-method approach to gain insight into how the consumer experience can be improved within a given context.
Prerequisites: DHE 161 with C- or better

DHE 263. HUMAN-CENTERED DESIGN THEORIES AND STRATEGIES. (4 Credits)
Overview of perception, semantics, and information design theories and strategies within a human-centered context.

DHE 270. APPEARANCE, POWER AND SOCIETY. (4 Credits)
Survey of the cultural, sociological, psychological, economic, and aesthetic influences on appearance and power. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: AIHM 270

DHE 271. INTRODUCTION TO RETAIL BUYING. (3 Credits)
Introduction to soft goods retailing with a focus on the role of the retail buyer. Fundamental retailing and merchandising concepts, sustainable and socially responsible decision-making related to retail buying, basic merchandising mathematics, and Excel skill development. Lec/lab.
Equivalent to: DHE 242, DHE 276

DHE 276. INTRODUCTION TO MERCHANDISING MANAGEMENT. (4 Credits)
Overview of merchandising functions within the textile and apparel industry. Fundamental merchandising concepts. Merchandising mathematics related to pricing and re-pricing, the profit and loss statement, and performance evaluation. Excel skill development. Lec/lab.
Prerequisites: DHE 170 with C- or better
Equivalent to: DHE 242, DHE 271, DSGN 276

DHE 281. DRAWING AND SKETCHING INTERIORS. (4 Credits)
Build technical drawing skills, observational and perspective drawing, as well as imagination and creativity. Working knowledge of visual methods for communicating design concepts and describing interior spaces.
Prerequisites: DHE 280 with D- or better
Equivalent to: AIHM 281, DSGN 281

DHE 283. BUILDING CONSTRUCTION AND MATERIALS. (3 Credits)
Introduction to the manufacture, characteristics and use of construction materials used in contract and residential construction, including environmentally friendly materials.
Equivalent to: DSGN 383

DHE 287. STUDIO I: DESIGN COMMUNICATION. (4 Credits)
Design communication through electronic media: 2D and 3D visualizations and presentations of interior space. Lec/studio.
Prerequisites: DHE 187 with C- or better
Equivalent to: DSGN 287

DHE 288. ENVIRONMENTAL BUILDING SYSTEMS. (3 Credits)
Lighting, heating, ventilating, air conditioning, and acoustical systems in residential and commercial buildings. Includes sustainable building principles.
Prerequisites: DHE 283 with C- or better and DHE 287 [C-]
Equivalent to: DHE 282

DHE 289. STUDIO II: RESIDENTIAL SPACE PLANNING. (4 Credits)
Utilization of space planning principles in the design of residences. Includes rendering, perspective drawing, graphic communication techniques, and model building.
Prerequisites: DHE 287 with C- or better
Equivalent to: DHE 385

DHE 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AIHM 299
This course is repeatable for 16 credits.

DHE 300. FIELD EXPERIENCE ORIENTATION AND DEVELOPMENT. (1-2 Credits)
 Exploration of career choices, goals, and field experience opportunities; preparation in planning, obtaining, and completing an internship. Graded P/N. Section 1: Apparel Design. Section 2: Interior Design and Housing Studies. Section 3: Merchandising Management. Section 4: Graphic Design.
This course is repeatable for 3 credits.

DHE 310. FIELD EXPERIENCE. (1-12 Credits)
Integration and application of academic preparation in an on-the-job work situation with supervision by personnel at the participating site and university faculty. Application must be made prior to participation. This course is repeatable for 16 credits.

DHE 321. ILLUSTRATION, PORTFOLIO, AND DESIGN DEVELOPMENT. (3 Credits)
Techniques in technical drawing, fashion illustration, and portfolio development; use of computer-aided design applications in the design of apparel.
Prerequisites: DHE 245 with C- or better and DHE 277 [C-]
Equivalent to: AIHM 321

DHE 326. SEWN PRODUCT DEVELOPMENT. (5 Credits)
Materials, assembly process, quality factors, and costs in the development of sewn textile products; consideration of consumer product expectations and intended end-use. Lec/lab.
Prerequisites: DHE 250 (may be taken concurrently) with C- or better or DHE 255 (may be taken concurrently) with C- or better
Equivalent to: AIHM 326, DHE 476

DHE 327. APPAREL DESIGN AND PRODUCTION 2. (4 Credits)
Terminology, construction techniques and processes used to produce apparel. Development of production patterns and specifications. Development of original apparel designs.
Prerequisites: DHE 227 with C- or better
Equivalent to: AIHM 327, DSGN 327

DHE 328. COMPUTER-AIDED PATTERN DEVELOPMENT. (3 Credits)
Computer-aided flat pattern, grading and marker techniques using pattern development software.
Equivalent to: DSGN 328

DHE 330. *FASHION FORECASTING AND MARKET ANALYSIS. (4 Credits)
Forecasting and market analysis processes applied to fashion goods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 233 with C- or better and WR 121 [C-] and WR 222 [C-]
Equivalent to: DHE 370, DSGN 330
DHE 334. FASHION HISTORY AND SOCIETY. (4 Credits)
The influence of society, culture, geography, fashion, and technology on
the design and consumption of dress, Late Middle Ages to 1899.
Prerequisites: DHE 330 with C- or better
Equivalent to: DHE 461

DHE 355. TEXTILE PERFORMANCE AND EVALUATION. (4 Credits)
Analysis and evaluation of textile materials and final products in relation
to end use. Performance properties and serviceability testing, product
specifications and industrial standards. Lec/lab.
Prerequisites: DHE 255 with C- or better
Equivalent to: DHE 453, DSGN 355

DHE 360. COLLABORATIVE STUDIO. (4 Credits)
Examines a variety of collaborative methodologies and situations.
Students will work across disciplines to solve complex collaborative
projects. The projects will be both client based and hypothetical. Lec/
studio.
Prerequisites: DHE 262 with C- or better and DHE 263 [C-]
Equivalent to: AIHM 366, DHE 437

DHE 366. CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT. (4
Credits)
Sociocultural study of the function and design of clothing, housing,
interiors, and textiles. Cultural diversity; impact of cross-cultural contact;
ethnicity.
Equivalent to: AIHM 366, DHE 437

DHE 370. TEXTILE AND APPAREL MARKET ANALYSIS. (4 Credits)
Organization, operation, and merchandising activities of the domestic
textile and apparel industries. Analysis of the marketing process and
the product/service mix of textile and apparel manufacturers. (Writing
Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 277 (may be taken concurrently) with C- or better
Equivalent to: AIHM 370, DHE 330, DSGN 330
Recommended: BA 390

DHE 376. RETAIL MERCHANDISE PLANNING AND PRESENTATION. (4
Credits)
Organization, operation, and competitive strategies of soft goods
retailers. Planning, procurement, and promotion of merchandise
assortments and inventory management.
Prerequisites: DHE 276 with C- or better and BA 215 [C-]
Equivalent to: DSGN 472

DHE 387. STUDIO III: ADVANCED DESIGN COMMUNICATION. (4 Credits)
Development of illustrative sketching, perspective drawing, concept
model construction, and presentation materials.
Prerequisites: DHE 289 with C- or better
Equivalent to: DSGN 387

DHE 389. STUDIO IV: KITCHEN AND BATH DESIGN. (4 Credits)
Kitchen and bath planning in compliance with building codes and
industry standards, with emphasis on resource conservation, safety, and
special needs. This course utilizes both CAD and hand drafting.
Prerequisites: DHE 387 with C- or better

DHE 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: AIHM 399
This course is repeatable for 16 credits.

DHE 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 401
This course is repeatable for 16 credits.

DHE 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 402
This course is repeatable for 16 credits.

DHE 403. THESIS. (1-16 Credits)
Equivalent to: AIHM 403, DSGN 403
This course is repeatable for 16 credits.

DHE 406. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 406, DSGN 406
This course is repeatable for 16 credits.

DHE 427. DRAPING. (4 Credits)
Garment design based on manipulation of fabric on a body form;
emphasis on the interrelationships between fabric, garment design, and
the human form.
Prerequisites: DHE 321 with C- or better and DHE 327 [C-]
Equivalent to: AIHM 427, DSGN 427

DHE 428. APPAREL PRODUCTION PROCESSES. (4 Credits)
Production pattern-making, pattern grading, marker making, garment
specifications, and cost analysis. Apparel assembly processes; analysis
of equipment capabilities and production processes.
Prerequisites: DHE 327 with C- or better
Equivalent to: AIHM 428, DSGN 428

DHE 429. ADVANCED APPAREL DESIGN. (4 Credits)
Design processes and research methods used to develop apparel
designs. Students will identify design problems and implement
appropriate methods to develop apparel products.
Prerequisites: DHE 321 (may be taken concurrently) with C- or better and
DHE 327 (may be taken concurrently) [C-] and DHE 427 (may be taken concurrently) [C-]
Equivalent to: DSGN 429

DHE 437. CONSUMER BEHAVIOR AND CULTURE. (4 Credits)
Global and cultural consumer behavior, globalization and cross-cultural
marketing related to soft goods merchandising and retailing.
Prerequisites: DHE 334 with C- or better
Equivalent to: DHE 366

DHE 443. STUDIO VI: COMMERCIAL DESIGN. (4 Credits)
Commercial design, space planning and specifications for facilities such
as retail, hospitality, healthcare, public institutions and offices.
Prerequisites: DHE 389 with C- or better
Equivalent to: AIHM 443

DHE 445. STUDIO VII: ADVANCED COMMERCIAL DESIGN. (4 Credits)
Interior design project development with emphasis on design of
hospitality environments. Application of knowledge of space planning,
building codes, and specifications to projects. Studio work includes
concept sketches, schematic drawings, contract documents, sample
boards, and models.
Prerequisites: DHE 443 with C- or better

DHE 453. PRODUCT QUALITY ASSURANCE. (4 Credits)
Analysis and evaluation of textile materials and final products in relation
to end use. Performance properties and serviceability testing, product
specifications and industrial standards. Lec/lab.
Prerequisites: DHE 255 with C- or better
Equivalent to: AIHM 453, DHE 355
Recommended: DHE 326

DHE 461. HISTORY OF THE NEAR ENVIRONMENT I. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and
building styles; primarily Euro-American, from the ancient world to the
Renaissance. The influence of social and cultural factors upon design of
the near environment. Need not be taken in sequence.
Equivalent to: AIHM 461, DHE 334
DHE 462. HISTORY OF THE NEAR ENVIRONMENT II. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the Renaissance to 1899. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence. (Bacc Core Course)
Equivalent to: AIHM 462, DHE 334

DHE 463. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men's and women's apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: AIHM 463, DHE 233
Recommended: DHE 461 or DHE 462

DHE 464. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of housing and interior design from the mid-19th century until the present.
Prerequisites: DHE 461 with C- or better or DHE 462 with C- or better
Equivalent to: AIHM 464, DSGN 464

DHE 470. RETAIL MERCHANDISING. (4 Credits)
Organization, operation, and competitive strategies of soft goods retailers. Planning, procurement, pricing, and promotion of merchandise assortments and inventory management.
Prerequisites: DHE 370 with C- or better
Equivalent to: AIHM 470

DHE 472. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles. Lec/rec.
Prerequisites: DHE 271 with C- or better and DHE 470 [C-] and (BA 215 [C-] or BA 215H [C-])
Equivalent to: DSGN 472

DHE 475. GLOBAL SOURCING OF TEXTILES, APPAREL, AND FOOTWEAR. (4 Credits)
Trade theory and the effects of trade policy, cultural values, and economics on the global production, distribution, and consumption of textiles, apparel, and footwear. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: AIHM 475, DSGN 475

DHE 476. LINE PLANNING AND PRODUCT DEVELOPMENT. (4 Credits)
Overview of the merchandising function within branded apparel companies and private label retailers.
Prerequisites: DHE 376 with C- or better
Equivalent to: DHE 326

DHE 481. PROFESSIONAL PRACTICE IN HOUSING AND INTERIOR DESIGN. (3 Credits)
Ethical, business, and legal aspects of the design profession. Development of written documents, schedules, specifications, and other materials typical of the profession. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: DHE 389 with C- or better
Equivalent to: AIHM 481

DHE 488. STUDIO VI: HEALTHCARE DESIGN. (4 Credits)
Interior design project development with emphasis on healthcare design, contract documents, and building codes.
Prerequisites: DHE 394 with C- or better
Equivalent to: DSGN 488

DHE 490. STUDY TOUR. (1-6 Credits)
Planned study tour with specific professional focus.
Equivalent to: AIHM 490
This course is repeatable for 16 credits.

DHE 499. SPECIAL TOPICS IN DESIGN AND HUMAN ENVIRONMENT. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

DHE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

DHE 510. INTERNSHIP (1-16 Credits)
This course is repeatable for 16 credits.

DHE 528. APPAREL PRODUCTION PROCESSES. (4 Credits)
Production pattern-making, pattern grading, marker making, garment specifications, and cost analysis. Apparel assembly processes; analysis of equipment capabilities and production processes.
Equivalent to: AIHM 528
Recommended: DHE 327

DHE 529. ADVANCED APPAREL DESIGN. (4 Credits)
Design processes and research methods used to develop apparel designs. Students will identify design problems and implement appropriate methods to develop apparel products. Lec/studio.
Recommended: Completion or concurrent enrollment in DHE 327 and DHE 427 and DHE 428

DHE 561. HISTORY OF THE NEAR ENVIRONMENT I. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the ancient world to the Renaissance. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 561
DHE 562. HISTORY OF THE NEAR ENVIRONMENT II. (4 Credits)
History of clothing, furniture, interiors, textiles, and housing and building styles; primarily Euro-American, from the Renaissance to 1899. The influence of social and cultural factors upon design of the near environment. Need not be taken in sequence.
Equivalent to: AIHM 562

DHE 563. HISTORY OF CONTEMPORARY FASHION. (4 Credits)
Historic analysis of fashion change in men's and women's apparel from 1890 to the present. The influence of social and cultural factors upon Euro-American fashion.
Equivalent to: AIHM 563

DHE 564. CONTEMPORARY HISTORY OF INTERIORS AND HOUSING. (3 Credits)
History of housing and interior design from the mid-19th century until the present.
Equivalent to: AIHM 564

DHE 566. RESEARCH IN THE CROSS CULTURAL ASPECTS OF THE NEAR ENVIRONMENT. (3 Credits)
Examines the research methods used to study the cultural aspects of the near environment. Case studies concerning cultural variation in the design and use of fabric, clothing and adornment, housing.
Equivalent to: AIHM 566

DHE 572. MERCHANDISE PLANNING AND CONTROL. (4 Credits)
Quantitative analysis of inventory planning, pricing, and control for the profitable management of soft goods; analysis of management problems using quantitative data and merchandising principles.
Prerequisites: DHE 570 (may be taken concurrently) with C or better
Recommended: BA 215

DHE 582. AESTHETIC AND PERCEPTUAL THEORIES OF THE NEAR ENVIRONMENT. (2 Credits)
Aesthetic aspects from the philosophical and theoretical bases formulated in art, art history, and psychology as applied to the near environment.
Equivalent to: AIHM 582

DHE 585. HUMAN BEHAVIOR AND THE NEAR ENVIRONMENT. (3 Credits)
Application of concepts and theories from cultural anthropology, sociology, psychology, and social psychology to the study of clothing and interiors. The significance of the near environment in the dynamics of social interaction.
Equivalent to: AIHM 585

DHE 594. RESEARCH METHODS IN DESIGN AND HUMAN ENVIRONMENT. (3 Credits)
Introduction to theory and research design in Design and Human Environment. Includes sampling, measurement, data collection (both qualitative and quantitative) and data analysis.

DHE 599. SPECIAL TOPICS IN DESIGN AND HUMAN ENVIRONMENT. (1-16 Credits)
Equivalent to: AIHM 599
This course is repeatable for 16 credits.

DHE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: AIHM 601
This course is repeatable for 16 credits.

DHE 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: AIHM 602
This course is repeatable for 16 credits.

DHE 603. THESIS. (1-16 Credits)
Equivalent to: AIHM 603
This course is repeatable for 999 credits.

DHE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AIHM 605
This course is repeatable for 16 credits.

DHE 606. PROJECTS. (1-16 Credits)
Equivalent to: AIHM 606
This course is repeatable for 16 credits.

DHE 607. SEMINAR. (1-16 Credits)
Equivalent to: AIHM 607
This course is repeatable for 16 credits.

DHE 608. WORKSHOP. (1-16 Credits)
Equivalent to: AIHM 608
This course is repeatable for 16 credits.

DHE 609. PRACTICUM. (1-16 Credits)
Equivalent to: AIHM 609
This course is repeatable for 16 credits.

DHE 610. INTERNSHIP/WORK EXPERIENCE. (1-16 Credits)
Equivalent to: AIHM 610
This course is repeatable for 16 credits.

DHE 690. THEORY DEVELOPMENT. (3 Credits)
Critical analysis of scientific explanation, research, theory, and paradigms. Focus on theory development, particularly within the area of the near environment.
Equivalent to: AIHM 690

Economics (ECON)

ECON 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 201. *INTRODUCTION TO MICROECONOMICS. (4 Credits)
An introduction to microeconomic principles including the study of price theory, economic scarcity, consumer behavior, production costs, the theory of the firm, market structure, and income distribution. Other selected topics may include market failure, international economics, and public finance. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: ECON 201H
Recommended: MTH 111

ECON 202. *INTRODUCTION TO MACROECONOMICS. (4 Credits)
An introduction to macroeconomic principles including study of the theories of output determination, consumption, investment, inflation, unemployment, and fiscal and monetary policy. Other selected topics may include the study of the international balance of payments, growth and development, and urban and regional problems. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: ECON 202H
Recommended: MTH 111

ECON 311. INTERMEDIATE MICROECONOMIC THEORY. (4 Credits)
An examination of demand theory, production and cost theory, game theory, behavioral economics, competitive and imperfectly competitive markets, and general equilibrium and welfare economics. ECON 311 and ECON 411 cannot both be taken for credit toward the economics major.
Prerequisites: ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AREC 311, EC 311
ECON 315. INTERMEDIATE MACROECONOMIC THEORY. (4 Credits)
An examination of macroeconomic aggregates, income determination, aggregate demand and supply. The basic macroeconomic models will be discussed such as Keynesian, Classical, Monetarist, and Neo-Classical. ECON 315 and ECON 415 cannot both be taken for credit toward the Economics major.
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-])
Equivalent to: EC 315

ECON 329. INTRODUCTION TO MATHEMATICAL ECONOMICS. (4 Credits)
Mathematical methods of economic analysis. Theory of economic structure and optimization developed through calculus and linear algebra, dynamic systems analyzed through integral calculus and difference and differential equations. The mathematical tools are developed in conjunction with their application to economic problems. Some acquaintance with calculus recommended.
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-]) and (MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-])
Equivalent to: EC 329

ECON 330. MONEY AND BANKING. (4 Credits)
Nature and functions of money; functions and operations of depositary institutions; the money market; central banking and monetary policy. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-])
Equivalent to: EC 330

ECON 340. INTERNATIONAL ECONOMICS. (4 Credits)
An overview of international economics with an emphasis on current events and applications, including classical and modern trade theory and the study of trade and exchange-rate policies. (SS) (See Schedule Comment regarding Bacc Core status.)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-])
Equivalent to: EC 340

ECON 350. FINANCIAL ECONOMICS. (4 Credits)
Discusses how various securities meet the needs of different economic agents and the efficiency of financial markets in meeting those needs. Topics include interest rates, valuation, investment risk, trading and market structure, arbitrage, market efficiency, debt markets, equity markets, and financial derivatives.
Prerequisites: ECON 201 with D- or better and ECON 202 [D-]

ECON 352. ENVIRONMENTAL ECONOMICS AND POLICY. (3 Credits)
Provides an overview of the interrelationships between economic activity, the environment, and public policy. Through case studies, discussion groups, readings, and group activities, students learn how economists define and analyze environmental problems and the types of policies they advocate for managing environmental quality. CROSSLISTED as AEC 352/EC 352. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: AEC 250 with D- or better or AREC 250 with D- or better or ECON 201 with D- or better or ECON 201H with D- or better
Equivalent to: AEC 352, AREC 352, AEC 352H, EC 352, ECON 352H

ECON 383. THE ECONOMICS OF DISCRIMINATION. (4 Credits)
An economic analysis of discrimination, focusing on labor market inequities for women and minorities. Historical and current trends in pay, education, and employment disparities, economic explanations for such disparities, and econometric evidence for wage and employment discrimination. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Prerequisites: ECON 201 with C- or better or ECON 201H with C- or better
Equivalent to: EC 383

ECON 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ECON 399H
This course is repeatable for 16 credits.

ECON 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ECON 399
This course is repeatable for 16 credits.

ECON 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EC 401
This course is repeatable for 16 credits.

ECON 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: EC 402
This course is repeatable for 16 credits.

ECON 403. THESIS. (1-16 Credits)
Equivalent to: EC 403
This course is repeatable for 16 credits.

ECON 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EC 405
This course is repeatable for 16 credits.

ECON 406. PROJECTS. (1-16 Credits)
Equivalent to: EC 406
This course is repeatable for 16 credits.

ECON 407. SEMINAR. (1-16 Credits)
Equivalent to: EC 407
This course is repeatable for 16 credits.

ECON 408. WORKSHOP. (1-16 Credits)
Equivalent to: EC 408
This course is repeatable for 16 credits.

ECON 410. INTERNSHIP. (1-16 Credits)
Equivalent to: EC 410
This course is repeatable for 16 credits.

ECON 411. ADVANCED MICROECONOMIC THEORY. (4 Credits)
Rigorous treatment of optimizing behavior of economic agents and markets. Examines utility maximization and demand; cost minimization, profit maximization and supply; perfect competition and monopoly; imperfect competition and game theory; and general equilibrium, social welfare and market failure using sophisticated mathematical tools. Students cannot receive credit toward the major for both ECON 311 and ECON 411.
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-])
ECON 414. BEHAVIORAL ECONOMICS. (4 Credits)
Economic analysis of the effects of social, cognitive, and emotional factors on individual decision making and their implications for market outcomes and policy making. Topics include time inconsistency, decision making under risk, cognitive dissonance, heuristics, social preferences, and experimental economics.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better

ECON 415. ADVANCED MACROECONOMIC THEORY. (4 Credits)
Macroeconomics as an application of general equilibrium theory. Macroeconomic models are developed taking preferences and technology as primitives. The models' short and long run predictions are analyzed and compared to the data. The welfare implications of fiscal and monetary policy are discussed. ECON 315 and ECON 415 cannot both be taken for credit toward the major.
Prerequisites: (ECON 201 with D- or better or ECON 201H with D- or better) and (ECON 202 [D-] or ECON 202H [D-]) and (MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-])

ECON 420. GAME THEORY. (4 Credits)
Systematically studies strategic interactions among multiple decision makers with applications in economics, politics, sociology, law, computer science, sports, and biology. Topics taught include static, sequential, and repeated games of perfect and imperfect information.
Attributes: LACS – Liberal Arts Social Core
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 420

ECON 423. PRE-ECONOMETRICS. (4 Credits)
Introduction to probability and statistics with an emphasis on estimation and hypothesis testing. Applications to economic models.
Prerequisites: MTH 241 with D- or better or MTH 251 with D- or better or MTH 251H with D- or better

ECON 424. INTRODUCTION TO ECONOMETRICS. (4 Credits)
Application of statistical techniques, including sampling theory, hypothesis testing, and multiple regression analysis, to economic models. Economic modeling, analysis of economic data, and policy analysis are emphasized. ECON 424 and ECON 427 cannot both be taken for credit toward the major. Lec/lab.
Prerequisites: (ECON 311 with C or better or ECON 411 with C or better) and (ST 351 [C] or ST 351H [C] or ECON 423 [C])
Equivalent to: ECON 325

ECON 427. INTRODUCTION TO ECONOMETRICS WITH CALCULUS. (4 Credits)
Addresses both the theory and practice of econometrics, including properties of estimators, modeling economic processes, estimation, hypothesis testing, prediction and interpretation of results. Students cannot receive credit toward the major for both ECON 424 and ECON 427. Lec/lab.
Prerequisites: (ECON 311 with C or better or ECON 411 with C or better) and ECON 423 [C]

ECON 428. *INTRODUCTION TO ECONOMIC RESEARCH. (4 Credits)
Basic methods of economic research: concepts and models; data sources, collection, and presentation; hypothesis formulation and testing; policy analysis. Written assignments apply methods. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECON 311 with C- or better or ECON 411 with C- or better
Equivalent to: ECON 329
Recommended: Prior completion of WR II

ECON 435. PUBLIC ECONOMICS. (4 Credits)
Composition and growth of government spending; theory of public expenditure; analysis of public expenditure programs; benefit-cost analysis; theory and practice of taxation; analysis of local, state, and federal taxes; government borrowing and fees; current issues in tax and expenditure policy.
Prerequisites: ECON 311 with C- or better or ECON 411 with C- or better
Equivalent to: EC 435

ECON 439. *PUBLIC POLICY ANALYSIS. (4 Credits)
Theory of public problems and decision making. Evaluation of public policy strategies, selected public programs and individual public projects considering the full range of efficiency and equity effects. Direct and indirect impacts of policy, strength of implicit incentives, administrative feasibility, and problems of policy implementation. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 439

ECON 440. ECONOMICS OF GLOBALIZATION. (4 Credits)
Examination of the phenomenon of globalization using economic analysis to explore controversial themes of the globalization debate—offshoring, sweatshops, child labor, environmental standards, intellectual property protection, cultural diversity, economic development, immigration, and governance.
Prerequisites: ECON 311 with D- or better
Equivalent to: EC 440

ECON 441. INTERNATIONAL FINANCE THEORY AND POLICY. (4 Credits)
Theories and policies of exchange rate regimes; fixed, floating and managed floats; internal and external trade and capital balances; international capital flows and institutions.
Prerequisites: ECON 315 with D- or better
Equivalent to: EC 441

ECON 455. ECONOMIC DEVELOPMENT. (4 Credits)
History, theories and policies for economic development in the Third World of underdeveloped countries. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: ECON 201 with D- or better and ECON 202 [D-]
Equivalent to: EC 449, EC 450, EC 455

ECON 460. INDUSTRIAL ORGANIZATION THEORY AND POLICY. (4 Credits)
The study of the causes of market structure, the behavior of firms in game theoretic settings, and the welfare implications of competitive and imperfectly competitive markets; United States antitrust and other laws regulating business behavior.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 460

ECON 461. LAW, ECONOMICS, AND REGULATION. (4 Credits)
The analysis of the effectiveness of laws and government regulations in fostering economic efficiency and fairness. Topics include the design of laws and policies to promote social welfare and the study of the effectiveness of criminal law, antitrust law, and the government regulation of business in promoting social goals.
Prerequisites: ECON 201 with D- or better or ECON 201H with D- or better

ECON 462. MANAGERIAL ECONOMICS. (4 Credits)
The application of microeconomic theory and quantitative methods to management decisions. Case-oriented course emphasizing actual business decisions.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
ECON 463. EFFICIENCY AND PRODUCTIVITY ANALYSIS. (4 Credits)
Workshop on the theory and measurement of performance, especially efficiency and productivity. Emphasis on application including introduction to user-friendly software.
Prerequisites: ECON 311 with C or better or ECON 411 with C or better

ECON 466. ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY. (4 Credits)
Reviews and analyzes the economics and structure of world markets for various traditional energy (e.g., oil, coal, natural gas), as well as renewable energy (wind, geothermal and solar) with the latter focusing on the Pacific Northwest electrical industry structure and regulatory framework.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECON 201 with D- or better or ECON 201H with D- or better

ECON 480. LABOR ECONOMICS AND SOCIAL POLICY. (4 Credits)
Interaction of workers and firms in labor markets, social policy and its effects on labor markets, human capital theory and education policy, discrimination and other sources of wage differentials, immigration, unemployment, inequality.
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 480
Recommended: Microeconomics such as ECON 517

ECON 491. ECONOMICS OF INEQUALITY. (4 Credits)
Prerequisites: ECON 311 with D- or better or ECON 411 with D- or better
Equivalent to: EC 491

ECON 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: ECON 311 or ECON 411

ECON 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EC 501
This course is repeatable for 16 credits.

ECON 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: EC 502
This course is repeatable for 16 credits.

ECON 503. THESIS. (1-16 Credits)
Equivalent to: EC 503
This course is repeatable for 999 credits.

ECON 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EC 505
This course is repeatable for 16 credits.

ECON 506. PROJECTS. (1-16 Credits)
Equivalent to: EC 506
This course is repeatable for 16 credits.

ECON 507. SEMINAR. (1-16 Credits)
Equivalent to: EC 507
This course is repeatable for 16 credits.

ECON 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 512. MICROECONOMIC THEORY I. (4 Credits)
Economic theories of consumer behavior and demand, production, cost, the firm, supply, and competitive and monopoly market structures.
Equivalent to: AREC 512
Recommended: ECON 312

ECON 513. MICROECONOMIC THEORY II. (4 Credits)
Economic theories of imperfect competition, input markets, general equilibrium and welfare economics.
Equivalent to: AREC 513
Recommended: ECON 512

ECON 514. BEHAVIORAL ECONOMICS. (4 Credits)
Economic analysis of the effects of social, cognitive, and emotional factors on individual decision making and their implications for market outcomes and policy making. Topics include time inconsistency, decision making under risk, cognitive dissonance, heuristics, social preferences, and experimental economics.
Recommended: ECON 311 or ECON 411

ECON 515. MACROECONOMIC THEORY I. (4 Credits)
Determination of income, employment, and prices in classical, Keynesian, monetarist, and new classical macroeconomic models. Theories of consumption, investment, money demand, and money supply. Monetary and fiscal policies, the role of expectations.
Equivalent to: EC 515
Recommended: ECON 315

ECON 517. MICROECONOMIC THEORY FOR MPP. (4 Credits)
Familiarizes MPP students who do not have a strong background in microeconomics with the material they will need for their future economics course work.
Recommended: Working knowledge of algebra and geometry.

ECON 520. GAME THEORY. (4 Credits)
Systematically studies strategic interactions among multiple decision makers with applications in economics, politics, sociology, law, computer science, sports, and biology. Topics taught include static, sequential, and repeated games of perfect and imperfect information.
Equivalent to: EC 520
Recommended: ECON 311 or ECON 411

ECON 523. STATISTICS FOR ECONOMETRICS. (4 Credits)
Examines mathematical and statistical topics essential for graduate-level econometric analysis, including matrix algebra, probability and distribution theory (emphasizing joint and conditional distributions), statistical inference, and econometric optimization algorithms.
Equivalent to: AREC 523
Recommended: MTH 253 and (ST 351 or ST 351H) and (ST 352 or ECON 424 or ECON 524)

ECON 524. INTRODUCTION TO ECONOMETRICS. (4 Credits)
Application of statistical techniques, including sampling theory, hypothesis testing, and multiple regression analysis, to economic models. Economic modeling, analysis of economic data, and policy analysis are emphasized.
Recommended: (ECON 311 or ECON 411 or ECON 517) and (ST 351 or ST 351H or ECON 423)

ECON 525. ECONOMETRIC METHODS. (4 Credits)
The use of multiple regression under generalized assumptions, specification problems, an introduction to simultaneous equation estimation, the classical linear model using matrices. Emphasis on the analysis of data and communication of findings.
Prerequisites: ECON 23 with C or better
Equivalent to: AREC 525, EC 525
Recommended: (ECON 424 or ECON 524) and ECON 512
ECON 526. APPLIED ECONOMETRICS. (4 Credits)
Model building, hypothesis testing, and appropriate estimation procedures including generalized least squares, seemingly unrelated regressions, simultaneous equations, maximum likelihood, and limited dependent variables. Emphasis on applications and interpretation of results.
Equivalent to: AREC 526, EC 526
Recommended: ECON 525

ECON 535. PUBLIC ECONOMICS. (4 Credits)
Composition and growth of government spending; theory of public expenditure; analysis of public expenditure programs; benefit-cost analysis; theory and practice of taxation; analysis of local, state, and federal taxes; government borrowing and fees; current issues in tax and expenditure policy.
Equivalent to: EC 539
Recommended: ECON 311 or ECON 411

ECON 539. PUBLIC POLICY ANALYSIS. (4 Credits)
Theory of public problems and decision making. Evaluation of public policy strategies, selected public programs and individual public projects considering the full range of efficiency and equity effects. Direct and indirect impacts of policy, strength of implicit incentives, administrative feasibility, and problems of policy implementation.
Equivalent to: EC 539
Recommended: ECON 311 and ECON 435

ECON 540. ECONOMICS OF GLOBALIZATION. (4 Credits)
Examination of the phenomenon of globalization using economic analysis to explore controversial themes of the globalization debate--offshoring, sweatshops, child labor, environmental standards, intellectual property protection, cultural diversity, economic development, immigration, and governance.
Equivalent to: EC 540
Recommended: ECON 311

ECON 541. INTERNATIONAL FINANCE THEORY AND POLICY. (4 Credits)
Theories and policies of exchange rate regimes; fixed, floating and managed floats; internal and external trade and capital balances; international capital flows and institutions.
Equivalent to: EC 541
Recommended: ECON 315

ECON 555. ECONOMIC DEVELOPMENT. (4 Credits)
History, theories and policies for economic development in the Third World of underdeveloped countries.
Equivalent to: EC 555
Recommended: (ECON 201 or ECON 201H) and (ECON 202 or ECON 202H)

ECON 560. INDUSTRIAL ORGANIZATION THEORY AND POLICY. (4 Credits)
The study of the causes of market structure, the behavior of firms in game theoretic settings, and the welfare implications of competitive and imperfectly competitive markets; United States antitrust and other laws regulating business behavior.
Equivalent to: EC 560
Recommended: ECON 311 or ECON 411

ECON 561. LAW, ECONOMICS, AND REGULATION. (4 Credits)
The analysis of the effectiveness of laws and government regulations in fostering economic efficiency and fairness. Topics include the design of laws and policies to promote social welfare and the study of the effectiveness of criminal law, antitrust law, and the government regulation of business in promoting social goals.
Recommended: ECON 201 or ECON 201H

ECON 562. MANAGERIAL ECONOMICS. (4 Credits)
The application of microeconomic theory and quantitative methods to management decisions. Case-oriented course emphasizing actual business decisions.
Recommended: ECON 311 or ECON 411

ECON 563. EFFICIENCY AND PRODUCTIVITY ANALYSIS. (4 Credits)
Workshop on the theory and measurement of performance, especially efficiency and productivity. Emphasis on application including introduction to user-friendly software.
Recommended: ECON 311 or ECON 411

ECON 566. ECONOMICS OF TRADITIONAL AND RENEWABLE ENERGY. (4 Credits)
Reviews and analyzes the economics and structure of world markets for various traditional energy (e.g., oil, coal, natural gas), as well as renewable energy (wind, geothermal and solar) with the latter focusing on the Pacific Northwest electrical industry structure and regulatory framework.
Recommended: ECON 201 or ECON 201H

ECON 570. MACROECONOMIC THEORY I. (4 Credits)
Introduction to dynamic macroeconomic theory, including a review of Keynesian models, continuous and discrete time programming, Solow, Ramsey, and endogenous growth models, and real business cycle theory.
Recommended: ECON 315 or equivalent.

ECON 580. LABOR ECONOMICS AND SOCIAL POLICY. (4 Credits)
Interaction of workers and firms in labor markets, social policy and its effects on labor markets, human capital theory and education policy, discrimination and other sources of wage differentials; immigration, unemployment, inequality.
Equivalent to: EC 580
Recommended: ECON 311 or ECON 411 or Microeconomics such as ECON 517

ECON 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: ECON 311 or ECON 411 or Microeconomics such as ECON 517

ECON 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 602. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ECON 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ECON 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
Education (ED)

ED 199. SPECIAL TOPICS. (1-16 Credits)
Students in this course receive training and experience in one-on-one and
group tutoring in varied courses. They are then assigned tutees.
Equivalent to: TCE 199
This course is repeatable for 16 credits.

ED 216. *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A
DEMOCRACY. (3 Credits)
Introduction to the historical, social, philosophical, political, legal and
economic foundations of education in Oregon, the United States, and
other countries in order to provide a framework from which to analyze
contemporary educational and environmental issues in various schools,
communities, and workplaces. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ED 216H, TCE 216

ED 216H. *PURPOSE, STRUCTURE, AND FUNCTION OF EDUCATION IN A
DEMOCRACY. (3 Credits)
Introduction to the historical, social, philosophical, political, legal and
economic foundations of education in Oregon, the United States, and
other countries in order to provide a framework from which to analyze
contemporary educational and environmental issues in various schools,
communities, and workplaces. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator
Equivalent to: ED 216

ED 219. CIVIL RIGHTS AND MULTICULTURAL ISSUES IN EDUCATION. (3
Credits)
Examination of the context of working with students, schools,
communities, and workplaces; the diversity of learning cultures (e.g.,
urban, suburban, rural) and the diversity among learners within those
different cultures; and the influence of culture on one’s learning.
Equivalent to: TCE 219

ED 253. LEARNING ACROSS THE LIFESPAN. (3 Credits)
An exploration of how learning occurs at all ages from early childhood
through adulthood. Covers major and emerging theories and styles, self-
reflection on implications of how learning occurs for self and others,
and the impact of these issues on the development and delivery of
instruction.
Equivalent to: TCE 253

ED 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: TCE 299
This course is repeatable for 16 credits.

ED 309. FIELD PRACTICUM. (3-6 Credits)
Placement in either an elementary, middle or secondary school. To assist
students to develop competencies in dealing with children or adolescents
according to the individual major of the university student.
Equivalent to: TCE 309
This course is repeatable for 18 credits.

ED 310. INTERNSHIP/WORK EXPERIENCE. (1-18 Credits)
This course is repeatable for 18 credits.

ED 340. *SUPPORTIVE DIFFERENTIATED ENVIRONMENTS. (3 Credits)
Addresses special abilities and needs of learners and helps prepare
teachers to develop strategies and instructional practices for diverse
learners and students with exceptionalities in a supportive and inclusive
classroom. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: TCE 340

ED 394. DIFFERENTIATION IN THE ELEMENTARY CLASSROOM. (2
Credits)
The role of culture, language, and group identification in learning will be
examined and applied to the consideration of differentiated instructional
strategies in grades K-5. Students will learn strategies teachers use to
help differentiate instruction to meet the diverse needs of students in the
elementary classroom.

ED 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: TCE 399
This course is repeatable for 16 credits.

ED 401. RESEARCH. (1-16 Credits)
Equivalent to: TCE 401
This course is repeatable for 16 credits.

ED 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 402
This course is repeatable for 16 credits.

ED 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ED 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: TCE 405
This course is repeatable for 16 credits.

ED 406. PROJECTS. (1-3 Credits)
Equivalent to: TCE 406
This course is repeatable for 16 credits.

ED 407. SEMINAR. (1-16 Credits)
Equivalent to: ED 407H, TCE 407
This course is repeatable for 16 credits.

ED 407H, SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ED 407, TCE 407
This course is repeatable for 16 credits.

ED 408. WORKSHOP. (1-3 Credits)
Equivalent to: ED 408H, TCE 408
This course is repeatable for 16 credits.

ED 408H. WORKSHOP. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ED 408, TCE 408H
This course is repeatable for 16 credits.

ED 409. PRACTICUM/CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: TCE 409
This course is repeatable for 16 credits.

ED 410. INTERNSHIP/WORK EXPERIENCE. (1-18 Credits)
Equivalent to: TCE 410
This course is repeatable for 18 credits.

ED 411. EDUCATIONAL PSYCHOLOGY, LEARNING AND DEVELOPMENT.
(3 Credits)
An opportunity to begin the transition from student to teacher. Explores
the relationship between human development and learning through the
life cycle.
Equivalent to: TCE 411
ED 412. LEARNING STYLES AND NEEDS IN ADOLESCENCE. (2 Credits)
Exploration of the particular learning styles and needs of the adolescent, major and emerging learning theories, individual learning styles including one's own learning styles, self-reflection on implications of how learning occurs, and the impact of these issues on the development and delivery of instruction.
Equivalent to: TCE 412

ED 413. LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT. (3 Credits)
Creating a positive culture in the classroom, managing student behavior, and engaging students in critical learning discourse are challenges faced by all educators. Students will learn to develop the components of a productive and safe learning environment.

ED 414. LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT. (2 Credits)
Students will expand their knowledge about constructing a positive K-12 classroom environment to a productive learning environment accommodated to fit the needs of a diversified student population.
Prerequisites: ED 413 with D- or better

ED 420. CLASSROOM MANAGEMENT. (3 Credits)
Build knowledge and learn techniques for cultivating a positive learning environment and for managing classrooms. Learn through examining the literature and observing relevant learning environments and classrooms. Explore factors that influence student behavior, including those associated with social and/multicultural student populations.

ED 424. TEACHER AS REFLECTIVE PRACTITIONER. (2 Credits)
Designed to help teachers make complex judgments based upon their knowledge and understanding of their students, the curriculum, and larger social and cultural issues through reflective practice. Problem solving related to teaching with strong focus on generating new knowledge about teaching, learning, and assessment.
Prerequisites: ED 407 with C- or better and ED 410 [C-]

ED 425. CURRICULUM IMPLEMENTATION AND INSTRUCTIONAL STRATEGIES 7-12. (4 Credits)
The relationship of theory to practice in teaching the content areas in grades 7-12 is examined. General curriculum trends as well as content selection in specific endorsement/subject areas are explored. This course is preparation for and is coordinated with part-time student teaching.
Equivalent to: TCE 425

ED 427. ASSESSMENT FOR K-12 INSTRUCTION. (2 Credits)
Students study and practice the administration, interpretation, and design of assessments for groups and individuals within the content area. Students will develop an understanding of a variety of assessment strategies for K-12 education that will enhance their understandings of the role of assessment in learning and curriculum design.
Equivalent to: TCE 427

ED 429. CURRICULUM, INSTRUCTION, AND ASSESSMENT FOR CTE. (3 Credits)
Build knowledge and skills in curriculum design, instructional strategies, and assessment for successful teaching in a Career and Technical Education and other specialty areas: (a) Agriculture Food and Natural Resource Systems, (b) Arts, Information and Communications, (c) Business Management, (d) Health Sciences (e) Human Resources, (f) Industrial and Engineering Systems, (g) Family and Consumer Sciences, (h) Career Trades.

ED 440. HUMAN DEVELOPMENT AND PSYCHOLOGY OF THE ADOLESCENT. (3 Credits)
Examines research from psychology, human development, and neuroscience to provide a holistic understanding of adolescents and learning with a focus on the middle/secondary student. Investigates the influence of family, neighborhood, peer, and school contexts on brain development; identity formation; and the challenges and opportunities of adolescence.

ED 450. FOUNDATIONS OF EDUCATION AND PLANNING. (4 Credits)
The first of three courses examining the iterative cycle of curriculum planning, instruction and assessment. An introduction to learning theory and the relationship between teaching and learning provide the foundation. An overview of the complete teaching cycle leads to a focus on curriculum planning based on state standards.

ED 451. ASSESSMENT. (4 Credits)
Assessment for and of learning and its importance to student engagement and advancement. Formal and informal writing derived from multiple revisions will result in documents intended for different audiences including parents, school administrators, and national assessment prompts citing research-based practices.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ED 450 with C or better

ED 452. USING DATA TO SUPPORT ALL STUDENTS. (3 Credits)
Teacher candidates will gather and analyze student data to inform instructional practice devoted to enhancing student learning; develop data literacy skills; differentiate instruction for targeted groups and individualized student learners while continuing to foster higher-order thinking and communication skills in the whole class: analyze patterns and gaps in individualized student learning; apply differentiated instruction and assessment strategies to support student growth; engage learners in goal setting; and identify teaching and assessment strategies to work with students with exceptional needs.
Prerequisites: ED 451 with C or better

ED 456. STRATEGIES FOR TEACHING LANGUAGE ARTS AND SOCIAL STUDIES. (3 Credits)
Exploration of language arts and social studies programs (e.g., children's literature, writing, special needs, spelling, and cultural factors). Development of research-based teaching strategies and assessment. Focuses on the development of inquiry approaches that reflect interdisciplinary curriculum as well as subject-specific pedagogy in the teaching of both social studies and language arts.
Equivalent to: TCE 456
Recommended: ED 216 and ED 219 and ED 253

ED 457. TEACHING ELEMENTARY MATHEMATICS FOR UNDERSTANDING. (3 Credits)
Part of the Education Double Degree. Explores the teaching of mathematics in K-8 classrooms in a manner consistent with state and national standards. Students learn teaching strategies that incorporate the development of mathematical models and mental constructs.
Equivalent to: TCE 457
Recommended: MTH 211 and MTH 212 and MTH 390
ED 458. STRATEGIES FOR TEACHING WELLNESS AND FINE ARTS. (2 Credits)
Exploration of recent trends and research-based practices in the teaching of wellness, physical education, and fine arts. Includes strategies, assessments, special needs, integrating curriculum through developmentally appropriate practices, content standards, and the value of developing holistic learners though an effective wellness and fine arts program.
Equivalent to: TCE 458
Recommended: ED 216 and ED 219 and ED 253

ED 463. STRATEGIES FOR TEACHING PHYSICAL EDUCATION HEALTH & WELLNESS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of physical education, health, and wellness in elementary school. Includes instructional strategies for developing holistic learners though an effective wellness program.

ED 465. ELEMENTARY METHODS: LITERACY. (2-4 Credits)
Understanding the theoretical and developmental foundations for literacy programs K-5; targeted reading, writing, listening, vocabulary, and speaking skill needs assessments; organizational strategies for teaching literacy; understanding dyslexia and how to differentiate instruction for students with dyslexia; and the integration of cultural diversity and social justice into literacy learning.
This course is repeatable for 4 credits.

ED 466. ELEMENTARY METHODS II: MATHEMATICS. (4 Credits)
Exploration of the teaching of early childhood/elementary school mathematics with emphases on problem solving, connections, representation, communication, reasoning and proof. Course will incorporate the development of mathematical models and mental constructs. Research-based, developmentally appropriate and culturally relevant practices will be incorporated into lessons.

ED 467. ELEMENTARY METHODS III: NATURAL AND SOCIAL SCIENCE. (4 Credits)
Inquiry approaches to the teaching and learning of the natural and social sciences are used to explore the structure of the disciplines and support the creation of instructional units that develop disciplinary knowledge and practices/skills while highlighting cross-cutting themes. Scientific literacy and civic competence are emphasized.

ED 468. ELEMENTARY METHODS IV: LANGUAGE ARTS. (4 Credits)
This course will build on ED 465: Elementary Methods I: Literacy. Development of pedagogy in teaching of reading to elementary-aged students, including the teaching of vocabulary, comprehension, phonics, fluency and motivation to read. Use of children's literature, assessment approaches, and special needs students are also addressed. Students will gain a deeper level of understanding in how to differentiate the teaching of reading at grades K-5, how to run a Writers' Workshop, and how to integrate literacy into other content areas.
Prerequisites: ED 465 with C or better

ED 469. STRATEGIES FOR TEACHING THE FINE ARTS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of performing arts (dance, music, theater) and the visual arts in elementary school. Includes instructional strategies for developing holistic learners though an effective fine arts program.

ED 470. BILITERACY INSTRUCTION. (3 Credits)
Explores literacy development in Spanish and English. Examines differences in literacy development across the two languages, as well as pedagogical approaches that leverage students' home language and literacy practices. Explores equity and bias in classroom language practices. Taught bilingually in Spanish and English.
Prerequisites: ED 472 (may be taken concurrently) with C or better

ED 471. MULTILINGUAL LINGUISTICS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics, pragmatics, and discourse. Focuses on academic language development and teaching implications for emergent bilingual students in Spanish-English K-12 dual language programs. Taught bilingually in Spanish and English.
Prerequisites: ED 472 (may be taken concurrently) with C or better

ED 472. FOUNDATIONS OF ESOL EDUCATION. (3 Credits)
Examines characteristics of English language learners (ELLs), key theories in language acquisition, the role of culture in language development, and instructional program models for ELLs, while considering implications for classroom instruction.
Equivalent to: TCE 472

ED 473. INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION. (3 Credits)
Examines characteristics of standards-based content-area instruction for emergent bilinguals. Includes integration of content and language development, classroom-based assessment, and use of technology to support student learning.
Prerequisites: ED 472 with C or better
Equivalent to: TCE 473

ED 474. PROJECT-BASED MATHEMATICS. (3 Credits)
Building on the foundational concepts covered in ED 457 and ED 466/ED 566, students will plan and apply project-based lessons. Students will transfer knowledge and skills of mathematics to real world problems and will learn to teach with a project-based approach.

ED 475. INTEGRATED STEM. (3 Credits)
Students will continue to develop their pedagogical content knowledge in science, technology, engineering, mathematics, and integrated STEM. Students will develop a deeper understanding of the crosscutting concepts common to all science endeavors and will learn how to use these concepts to bridge across science or STEM curriculum units. Students will also examine and develop expertise in using science and engineering practices to lead students in authentic inquiry. Integrating crosscutting concepts, science and engineering practices, and disciplinary core ideas, students will learn and practice the development of curriculum and instruction utilizing the engineering design process.

ED 476. PARTNERSHIPS AND IDEOLOGIES IN ESOL EDUCATION. (3 Credits)
Considers social and political issues pertaining to educating English language learners. Focuses on exploring multiple ideologies in ESOL and building partnerships across schools, families, and communities.
Prerequisites: ED 472 with C or better
Equivalent to: TCE 476

ED 477. DIFFERENTIATION FOR STUDENTS WITH SPECIAL NEEDS. (3 Credits)
Building on the foundational concepts covered in HDFS 431, this course goes into greater depth on how to provide students with a range of exceptionalities with education in the least restrictive environment. Teacher candidates will explore differentiated instruction techniques for students with special needs that can be used in both the regular education and pull out Special Education resource classrooms.
ED 478. SPECIAL EDUCATION LAW RIGHTS AND REGULATIONS. (3 Credits)
In-depth review of special education law and regulations that protect and provide educational rights for students with disabilities. Teacher candidates will leave the class understanding both the historical and current legal rights of students receiving special education and how to best meet those rights in both the regular and special education resource classrooms.

ED 479. LINGUISTICS FOR TEACHERS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics, pragmatics, and discourse. Focuses on teaching implications—from psycholinguistic, sociolinguistic, and critical perspectives—for emergent bilingual students in P-12 contexts.
Prerequisites: ED 472 with C or better
Equivalent to: TCE 479

ED 480. TEACHING MATH TO SECONDARY LEARNERS IN CONTEXT. (3 Credits)
Enhance and reinforce mathematics embedded within occupational-specific curricula taught at the secondary level to prepare Career and Technical Education teachers for licensure.

ED 481. READING AND WRITING FOR SECONDARY LEARNERS IN CONTEXT. (3 Credits)
Enhance and reinforce the authentic reading and writing embedded within occupationally relevant materials to prepare Career and Technical Education teachers for licensure.

ED 483. DEVELOPMENTAL READING. (3 Credits)
Development of pedagogy in teaching of reading to elementary-aged students, including teaching of vocabulary, comprehension, phonics, fluency and motivation to read. Use of children’s literature, assessment approaches, and special needs students are also addressed. This is a PTCE course in the elementary Double Degree Program.
Equivalent to: TCE 483

ED 484. INTRODUCTION TO CAREER AND TECHNICAL EDUCATION. (3 Credits)
A study of the history of Career and Technical Education, the impact of the educational reform on Career and Technical Education and workforce development. Topics include leaders in vocational education; legislative initiatives, social issues, and organizations involved in and impacting Career and Technical Education.

ED 492. TECHNOLOGY TOOLS FOR TEACHING. (2 Credits)
Teacher candidates will learn the technology skills needed to be successful as a classroom teacher. Topics range from exploration of how digital tools can be used in instruction, assessment, communication, and collaboration in educational settings to bring vibrant energy into student learning and engagement. The course also covers responsible digital citizenship, responsible use and ethics of technology in the classroom.

ED 493. READING, LITERATURE, AND LANGUAGE DEVELOPMENT IN THE CONTENT. (2 Credits)
Examination of reading, literature, and language development methods that can be used by middle school and high school teachers to support students’ learning of content area information. Development of specific reading strategies in content areas.
Equivalent to: TCE 493

ED 494. CONTENT STANDARDS AND CURRICULUM DEVELOPMENT FOR HIGH SCHOOL. (3 Credits)
Exploration of content standards, materials and methods appropriate for high school students. Develops skills in work sample methodology through the design of effective instruction, integrating a variety of methods with existing understandings of content area, how people learn, and the diverse communities in which they work.
Equivalent to: TCE 494

ED 496. TECHNOLOGY FOR EDUCATORS. (3 Credits)
Explore the integration of current and emerging technologies into K-12 content areas by engaging learners in real world issues and learning in a social context. Integrate technologies that promote critical thinking, communication, collaboration, and creativity. Discuss technologies in terms of cultural linguistic diversity. Gain transferable skills. Taught via Ecampus only.
Recommended: Basic computer literacy.

ED 497. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: TCE 497
This course is repeatable for 16 credits.

ED 501. RESEARCH. (1-16 Credits)
Equivalent to: TCE 501
This course is repeatable for 16 credits.

ED 502. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 502
This course is repeatable for 16 credits.

ED 503. THESIS. (1-16 Credits)
Equivalent to: TCE 503
This course is repeatable for 999 credits.

ED 505. READING & CONFERENCE. (1-16 Credits)
Equivalent to: TCE 505
This course is repeatable for 16 credits.

ED 506. PROJECTS. (1-3 Credits)
Equivalent to: TCE 506
This course is repeatable for 16 credits.

ED 507. SEMINAR. (1-16 Credits)
Equivalent to: TCE 507
This course is repeatable for 16 credits.

ED 508. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 508
This course is repeatable for 16 credits.

ED 509. PRACTICUM. (1-16 Credits)
Equivalent to: TCE 509
This course is repeatable for 16 credits.

ED 510. INTERNSHIP. (1-18 Credits)
By special permission and arrangement.
Equivalent to: TCE 510
This course is repeatable for 40 credits.

ED 513. LEARNING ENVIRONMENTS I: FOSTERING CLASS ENGAGEMENT. (3 Credits)
Creating a positive culture in the classroom, managing student behavior, and engaging students in critical learning discourse are challenges faced by all educators. Students will learn to develop the components of a productive and safe learning environment.
ED 514. LEARNING ENVIRONMENTS II: ADVANCING EVERY STUDENT. (2 Credits)
Students will expand their knowledge about constructing a positive K-12 classroom environment to a productive learning environment accommodated to fit the needs of a diversified student population.
Prerequisites: ED 513 with B or better

ED 515. LEARNING ENVIRONMENTS III: CULTURES AND COMMUNITIES. (2 Credits)
The third in a series of courses to assist the Teacher candidate in developing a classroom culture of learning that challenges every student to succeed and thrive. Teacher candidates will understand the important role that culture and community play in the teaching and learning process, and develop culturally responsive teaching practices.
Prerequisites: ED 513 with B or better and ED 514 [B]

ED 517. ACADEMIC WRITING FOR MASTER'S STUDENTS. (1 Credit)
A writing refresher that addresses academic voice, style, tone, construction, conventions, and writing style appropriate for master’s-level research papers and capstones.
Equivalent to: TCE 517
This course is repeatable for 2 credits.

ED 518. PROFESSIONAL PRACTICE IN THE TEACHING COMMUNITY. (2 Credits)
The professional themes of communication, collaboration, reflection, knowledge of learners, professional ethics, social justice and cultural understanding will be explored and applied to teaching contexts, behaviors, dispositions, and actions.

ED 519. CAPSTONE: TEACHING AS A PROFESSION. (3 Credits)
Capstone course for the MAT in which teacher candidates further develop their educational philosophy and analyze their professional growth in alignment with national standards.

ED 520. CLASSROOM MANAGEMENT. (3 Credits)
Build knowledge and learn techniques for cultivating a positive learning environment and for managing classrooms. Learn through examining the literature and observing relevant learning environments and classrooms. Explore factors that influence student behavior, including those associated with social and/or multicultural student populations.
Equivalent to: TCE 520

ED 521. FUNDS OF KNOWLEDGE IN EDUCATION. (3 Credits)
An introduction to multicultural education and developing cultural competence by using a funds of knowledge approach. This approach helps educators combine fieldwork and ethnographic research methods to gain cultural competence about the students they serve. Educators explore their own funds of knowledge as well as the children’s through exploring their community and developing activities centered on children’s own connections and resources.

ED 522. RACIAL AND CULTURAL HARMONY IN THE K-12 CLASSROOM. (3 Credits)
An overview of many issues relevant to the increasingly diverse student population in public schools today. It explores how a culturally competent perspective can be incorporated into curriculum design, teaching strategies, and interactions with students and parents. The course is both self-directed and communal, requiring students to respond to the materials and each other, yet at their own pace.
Equivalent to: TCE 522

ED 524. TEACHER AS REFLECTIVE PRACTITIONER. (2-3 Credits)
Designed to help teachers make complex judgements based upon their knowledge and understanding of their students, the curriculum, and larger social and cultural issues through reflective practice. Problem solving related to teaching with strong focus on generating new knowledge about teaching, learning, and assessment.
Equivalent to: TCE 524

ED 528. ASSESSMENT FOR LEARNING. (3 Credits)
Applies the formative learning cycle to through development of an assessment plan. Examines various formative assessment practices that promote higher order thinking and empower students to show evidence of their learning through self-assessment and feedback.
Equivalent to: TCE 528

ED 531. SCIENCE METHODS I: INQUIRY AND THE NATURE OF SCIENCE. (4 Credits)
Introduction to (1) fundamentals of science teaching including the nature of science and inquiry, (2) designing instructional sequences and selecting curriculum resources aligned to state science standards and research-based learning progressions, (3) effective teaching moves, (4) supporting acquisition of academic language, and (5) productive and safe science learning environments.
Equivalent to: SED 513

ED 532. SCIENCE METHODS II: SUPPORTING STUDENTS' CONCEPTUAL CHANGE. (4 Credits)
Development of skill in identifying and addressing misconceptions or naive conceptions as part of the individualized conceptual change process. Integration of technology tools for instruction and assessment. Development of high-leverage science teaching practices with a focus on enhancing classroom discourse and evidence-based argumentation with a survey of science curriculum models.
Prerequisites: ED 531 with B or better

ED 533. SCIENCE METHODS III: SCIENCE FOR ALL LEARNERS. (4 Credits)
Teaching science as a community of practice means addressing the needs of all learners, particularly those underrepresented in science. Uses technology to enhance high-leverage teaching practices and practices safe and effective laboratory teaching methods. Explores contextualized and interdisciplinary approaches to science education.
Prerequisites: ED 531 with B or better and ED 532 [B]

ED 537. MATHEMATICAL METHODS I: FOUNDATIONS OF NUMERICAL THOUGHT. (4 Credits)
Introduction to the fundamentals of mathematics teaching including the nature and goals of mathematical thinking, numeracy, inquiry, and related academic language of mathematics. Students are introduced to the high high-leverage practices of ambitious mathematics teaching, designing instructional sequences and selecting curriculum resources aligned to state science standards and research-based learning progressions.
Equivalent to: SED 514

ED 538. MATHEMATICS METHODS II: CYCLES OF ENACTMENT. (4 Credits)
Teacher candidates create instructional units based on student knowledge and skill while attending to needed accommodations. Designed to help the teacher candidate select or modify instructional materials based on student prior knowledge, experience, and interests; make accommodations for students; and provide for multiple representations across a unit of instruction.
Prerequisites: ED 537 with B or better
ED 539. MATHEMATICAL METHODS III: MATHEMATICS FOR EVERY LEARNER. (4 Credits)
Teacher candidates will develop practices that support all students, regardless of background or ability. The teacher candidate will design a unit of instruction with complex learning goals that are cross- and multi-disciplinary, draw on multiple perspectives, and invoke higher order thinking and communication skills.
Prerequisites: ED 537 with B or better and ED 538 [B]

ED 540. HUMAN DEVELOPMENT AND PSYCHOLOGY OF THE ADOLESCENT. (3 Credits)
Examines research from psychology, human development, and neuroscience to provide a holistic understanding of adolescents and learning with a focus on the middle/secondary student. Investigates the influence of family, neighborhood, peer, and school contexts on brain development; identity formation; and the challenges and opportunities of adolescence.

ED 542. TEACHER LEADERSHIP. (3 Credits)
Examines current conceptions, research, and philosophies of educational leadership. The goal is to promote teacher-leadership in effective teaching and learning and influence in local educational policies and programs.
Equivalent to: TCE 542

ED 544. TEACHING CRITICAL LITERACY. (3 Credits)
Examines literacy curriculum and teaching practices in various real world contexts, such as critical literacy, supporting second language learners, argumentation, reading engagement and social justice. While still addressing technical dimensions of literacy education, students write critical literacy curricula, take turns leading critical book discussions, and learn to critique text bias. Course challenges students to develop critical consciousness as teachers of literacy in a democracy.

ED 548. STUDENTS WITH SPECIAL NEEDS. (2 Credits)
Explores the broad range of special needs that are represented in today's classrooms. Addresses various types and characteristics of disabilities as well as collaborating with specialists and families with children with special needs. Discussion strategies and instructional practices to enhance the learning of diverse students in the inclusive classroom.

ED 549. TEACHING IN A DIFFERENTIATED AND DIVERSE CLASSROOM. (3 Credits)
Addresses the philosophical framework, strategies, and assessment of differentiation to meet the needs of all students in the classroom.
Equivalent to: TCE 549

ED 550. THE EFFECTIVE TEACHING CYCLE I: FOUNDATIONS AND PLANNING. (4 Credits)
The first of three courses examining the iterative cycle of curriculum planning, instruction, and assessment. An introduction to learning theory and the relationship between teaching and learning provides the foundation. An overview of the complete teaching cycle leads to a focus on curriculum planning based on state standards.

ED 551. THE EFFECTIVE TEACHING CYCLE II: ASSESSMENT. (4 Credits)
The second of three courses examining the iterative cycle of curriculum planning, instruction, and assessment. Learning in this class will concentrate on assessment for and of learning and its importance to student engagement and advancement.
Prerequisites: ED 550 with B or better

ED 558. STRATEGIES FOR TEACHING WELLNESS AND FINE ARTS. (2 Credits)
Exploration of recent trends and research-based practices in the teaching of wellness, physical education, and fine arts. Includes strategies, assessments, special needs, integrating curriculum through developmentally appropriate practices, content standards, and the value of developing holistic learners though an effective wellness and fine arts program.

ED 559. STRATEGIES FOR TEACHING HUMANITIES. (3 Credits)
Pedagogical approaches to teaching language arts and social studies in K-5; multiple subject classrooms. Focus on developing research-based daily lessons and unit plans that integrate curriculum, support national standards, and use an inquiry approach for student learning.

ED 560. CHANGES IN ESOL EDUCATION. (3 Credits)
Explores recent developments in education for K-12 emergent bilingual students, examining changes in theory, policy, and instruction. Practice-based projects draw on new language acquisition theories to address both language and content-knowledge development. Course work intended for K-12 teachers who earned an ESOL endorsement more than five years ago, as well as those with equivalent background knowledge.
Recommended: K-12 teaching license with ESOL endorsement

ED 561. ACTION RESEARCH. (1-3 Credits)
Examines action research as a vehicle for teacher and administrator professional development. Specific topics of study include problem posing, data collection and analysis, theory building, and writing the report.
Equivalent to: TCE 561
This course is repeatable for 3 credits.

ED 562. INTRODUCTION TO EDUCATIONAL RESEARCH. (3 Credits)
Explores the purpose and use of social science research in education with emphasis on action and applied research. Designed to help teachers and informal educators to critically read, interpret, and apply research findings to the diverse contexts in which they work, and to become informed consumers of educational research.
Equivalent to: TCE 562

ED 563. STRATEGIES FOR TEACHING PHYSICAL EDUCATION HEALTH & WELLNESS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of physical education, health, and wellness in elementary school. Includes instructional strategies for developing holistic learners though an effective wellness program.

ED 565. ELEMENTARY METHODS: LITERACY. (2-4 Credits)
Understanding the theoretical and developmental foundations for literacy programs K-5; targeted reading, writing, listening, vocabulary, and speaking skill needs assessments; organizational strategies for teaching literacy; understanding dyslexia and how to differentiate instruction for students with dyslexia; and the integration of cultural diversity and social justice into literacy learning.
This course is repeatable for 4 credits.

ED 566. ELEMENTARY METHODS: MATHEMATICS. (4 Credits)
Exploration of the teaching of early childhood/elementary school mathematics with emphases on problem solving, connections, representation, communication, reasoning and proof. Course will incorporate the development of mathematical models and mental constructs. Research-based, developmentally appropriate and culturally relevant practices will be incorporated into lessons.
ED 567. ELEMENTARY METHODS: NATURAL AND SOCIAL SCIENCE. (4 Credits)
Inquiry approaches to the teaching and learning of the natural and social sciences are used to explore the structure of the disciplines and support the creation of instructional units that develop disciplinary knowledge and practices/skills while highlighting cross-cutting themes. Scientific literacy and civic competence are emphasized.

ED 569. STRATEGIES FOR TEACHING THE FINE ARTS. (1 Credit)
Exploration of recent trends and research-based practices in the teaching of performing arts (dance, music, theater) and the visual arts in elementary school. Includes instructional strategies for developing holistic learners though an effective fine arts program.

ED 570. BILITERACY INSTRUCTION. (3 Credits)
Explores literacy development in Spanish and English. Examines differences in literacy development across the two languages, as well as pedagogical approaches that leverage students' home language and literacy practices. Explores equity and bias in classroom language practices. Taught bilingually in Spanish and English.
Prerequisites: ED 572 (may be taken concurrently) with C or better

ED 571. MULTILINGUAL LINGUISTICS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics, pragmatics, and discourse. Focuses on academic language development and teaching implications for emergent bilingual students in Spanish-English K-12 dual language programs. Taught bilingually in Spanish and English.
Prerequisites: ED 572 (may be taken concurrently) with C or better

ED 572. FOUNDATIONS OF ESOL EDUCATION. (3 Credits)
Examines characteristics of English language learners (ELLs), key theories in language acquisition, the role of culture in language development, and instructional program models for ELLs, while considering implications for classroom instruction.
Equivalent to: TCE 572

ED 573. INSTRUCTIONAL APPROACHES FOR ESOL EDUCATION. (3 Credits)
Examines characteristics of standards-based content-area instruction for emergent bilinguals. Includes integration of content and language development, classroom-based assessment, and use of technology to support student learning.
Prerequisites: ED 572 with C or better
Equivalent to: TCE 573

ED 574. PROJECT-BASED MATHEMATICS. (3 Credits)
Building on the foundational concepts covered in ED 457 and ED 466/ED 566, students will plan and apply project-based lessons. Students will transfer knowledge and skills of mathematics to real world problems and will learn to teach with a project-based approach.

ED 575. INTEGRATED STEM. (3 Credits)
Students will continue to develop their pedagogical content knowledge in science, technology, engineering, mathematics, and integrated STEM. Students will develop a deeper understanding of the crosscutting concepts common to all science endeavors and will learn how to use these concepts to bridge across science or STEM curriculum units. Students will also examine and develop expertise in using science and engineering practices to lead students in authentic inquiry. Integrating crosscutting concepts, science and engineering practices, and disciplinary core ideas, students will learn and practice the development of curriculum and instruction utilizing the engineering design process.

ED 576. PARTNERSHIPS AND IDEOLOGIES IN ESOL EDUCATION. (3 Credits)
Considers social and political issues pertaining to educating English language learners. Focuses on exploring multiple ideologies in ESOL and building partnerships across schools, families, and communities.
Prerequisites: ED 572 with C or better
Equivalent to: TCE 576

ED 577. DIFFERENTIATION FOR STUDENTS WITH SPECIAL NEEDS. (3 Credits)
Building on the foundational concepts covered in HDFS 431, this course goes into greater depth on how to provide students with a range of exceptionalities with education in the least restrictive environment. Teacher candidates will explore differentiated instruction techniques for students with special needs that can be used in both the regular education and pull out Special Education resource classrooms.

ED 578. SPECIAL EDUCATION LAW RIGHTS AND REGULATIONS. (3 Credits)
In-depth review of special education law and regulations that protect and provide educational rights for students with disabilities. Teacher candidates will leave the class understanding both the historical and current legal rights of students receiving special education and how to best meet those rights in both the regular and special education resource classrooms.

ED 579. LINGUISTICS FOR TEACHERS. (3 Credits)
Explores linguistic categories: phonology, morphology, syntax, semantics, pragmatics, and discourse. Focuses on teaching implications—from psycholinguistic, sociolinguistic, and critical perspectives—for emergent bilingual students in P-12 contexts.
Prerequisites: ED 572 with C or better
Equivalent to: TCE 579

ED 582. STRATEGIES FOR DEVELOPING LITERACY. (3 Credits)
Focus on teaching of reading to K-5 students. Instruction in pedagogical techniques and assessment on teaching vocabulary, comprehension, phonics and fluency. Strategies related to motivation to read, integration of cultural diversity and social justice and the needs of diverse learners in literacy development are also addressed.

ED 584. LANGUAGE ARTS METHODS I: ADOLESCENT LITERACY. (4 Credits)
Teaching language arts to middle and high school students requires a deep understanding of how reading and writing to learn occur. Guided by current professional and state literacy standards, students will learn to assess and advance adolescent reading comprehension, and writing and speaking skills.

ED 585. LANGUAGE ARTS METHODS II: STRATEGIES FOR GRADES 5-12. (4 Credits)
Explores the integration and implementation of curriculum and high leverage instructional practices that respond to the learning needs of adolescents in language arts classrooms. Examines the importance of metacognitive strategies in the teaching of content-related skills and concepts, and how to create school cultures that support high achievement.

ED 586. LANGUAGE ARTS METHODS III: CURRICULUM AND THE PROFESSION. (4 Credits)
Learning to teach language arts as a community of practice including the development of high-leverage instructional practices. Focus on enhancing classroom discourse and building student comprehension, meaning construction, interpretation, and response to complex text. Integration of technology tools for instruction and assessment.
Prerequisites: ED 584 with B or better and ED 585 [B]
ED 587. SOCIAL STUDIES METHODS I: ADOLESCENT LITERACY. (4 Credits)
Teaching social studies to middle and high school students requires a deep understanding of how reading and writing to learn occur. Guided by current professional and state literacy standards, students will learn to assess and advance adolescent content reading comprehension, writing and speaking skills.

ED 588. SOCIAL STUDIES METHODS II: STRATEGIES FOR GRADES 5-12. (4 Credits)
Explores the integration and implementation of curriculum and high leverage instructional practices that respond to the learning needs of adolescents in secondary social studies classrooms. Examines the importance of metacognitive strategies in the teaching of content-related skills and concepts, and how to create school cultures that support high achievement.

ED 589. SOCIAL STUDIES METHODS III: CURRICULUM AND THE PROFESSION. (4 Credits)
Learning to teach social studies as a community of practice including the development of high-leverage instructional practices. Focus on curriculum strategies that provide opportunities for learners to develop and use facts, concepts, interpretations, and analyses to build and support arguments. Integration of technology tools for instruction and assessment.
Prerequisites: ED 587 with B or better and ED 588 [B]

ED 590. SOCIAL JUSTICE IN EDUCATION. (3 Credits)
Examines social, environmental and ecological justice in educational settings focusing on bias critique in text, development of social justice curriculum, and creation of an action related to a social justice issue. The interconnectedness of social and ecological justice is also explored. Various international justice standards are used to ground students' work in curriculum development.
Equivalent to: TCE 590

ED 592. TECHNOLOGY TOOLS FOR TEACHING. (1-2 Credits)
Teacher candidates will learn the technology skills needed to be successful as a classroom teacher. Topics range from exploration of how digital tools can be used in instruction, assessment, communication, and collaboration in educational settings to bring vibrant energy into student learning and engagement. The course also covers responsible digital citizenship, responsible use and ethics of technology in the classroom.
Equivalent to: TCE 592
This course is repeatable for 2 credits.

ED 594. DIFFERENTIATION. (2 Credits)
Issues of K-12 learner and the role of culture, language, and group identification in learning will be examined and applied to the consideration of differentiated instructional strategies.

ED 595. EDUCATIONAL DEVELOPMENT. (2 Credits)
Issues of K-12 learner social/emotional/cognitive development across multiple areas of learning will be examined, with consideration given to impact on classroom pedagogy.

ED 596. TECHNOLOGY FOR EDUCATORS. (3 Credits)
Explore the integration of current and emerging technologies into K-12 content areas by engaging learners in real world issues and learning in a social context. Integrate technologies that promote critical thinking, communication, collaboration, and creativity. Discuss technologies in terms of cultural linguistic diversity. Gain transferable skills. Taught via Ecampus only.
Equivalent to: TCE 596
Recommended: Basic computer literacy.

ED 597. K-5 STEM INTEGRATION IN DIVERSE CLASSROOMS. (2 Credits)
An investigation of theory and practice related to science teaching and learning in diverse classrooms through integration of science, math, literacy and social studies.

ED 599. SPECIAL TOPICS. (1-4 Credits)
Equivalent to: TCE 599
This course is repeatable for 90 credits.

ED 601. RESEARCH. (1-16 Credits)
Equivalent to: TCE 601
This course is repeatable for 16 credits.

ED 602. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: TCE 602
This course is repeatable for 16 credits.

ED 603. THESIS. (1-16 Credits)
Equivalent to: TCE 603
This course is repeatable for 999 credits.

ED 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: TCE 605
This course is repeatable for 16 credits.

ED 606. PROJECTS. (1-16 Credits)
Equivalent to: TCE 606
This course is repeatable for 16 credits.

ED 607. SEMINAR. (1-16 Credits)
Equivalent to: TCE 607
This course is repeatable for 16 credits.

ED 608. WORKSHOP. (1-16 Credits)
Equivalent to: TCE 608
This course is repeatable for 16 credits.

ED 609. PRACTICUM/CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: TCE 609
This course is repeatable for 16 credits.

ED 610. INTERNSHIP. (1-15 Credits)
Equivalent to: TCE 610
This course is repeatable for 15 credits.

ED 650. EQUITY AND EDUCATION POLICY. (3 Credits)
Introduces students to key educational policy debates, with a particular focus on attempts to use education policy to advance equity. Examines different visions for the purpose of education and different definitions of equity. Explores the roles of different actors within education policy, including legislators, courts, and non-governmental organizations. Provides students with frameworks for analyzing education policy, which students will then apply to analyze a current policy debate that is of interest to them.

ED 651. RESEARCH BILINGUALISM AND MULTILINGUALISM. (3 Credits)
Develops critical research skills to create new knowledge in the field of multilingualism. Examines interdisciplinary and intersectional perspectives to consider notions of identity among multilinguals and explore the historical trajectory of bilingualism and multilingualism research. Provides a broad understanding of the theoretical and methodological frameworks used to study bilingualism and multilingualism in globalized contexts.
ED 652. ETHNOGRAPHIC METHODS. (3 Credits)
As an advanced qualitative method class, this course introduces theory and ethnographic research methods by presenting the various ways by which socio-cultural anthropologists observe and analyze phenomena, groups or individuals in everyday language and social practices in their local and global contexts, taking into account issues of language, equity and educational policy. Students will carry out an ethnographic research project of a particular phenomenon they wish to learn more about.
Prerequisites: SED 622 with B or better

ED 653. DISCOURSE, IDENTITY AND EDUCATION. (3 Credits)
Builds a foundation in discourse theory and its applications to identity and education. Includes empirical studies that draw from particular lenses of discourse theory, exemplifying how these scholars organize the design, implementation, and discussion of research around discourse theory. Develops knowledge of discourse theory to propose a study that could be conducted drawing from discourse analytic perspectives.

ED 808. WORKSHOP. (1-4 Credits)
Equivalent to: TCE 808
This course is repeatable for 16 credits.

Electrical & Computer Engineer (ECE)

ECE 111. INTRODUCTION TO ECE: TOOLS. (3 Credits)
Introduction to the electrical and computer engineering professional practice. Covers the foundations of engineering problem solving and other skills necessary for success. Students will be taught engineering practice through hands-on approaches. Recommended for electrical and computer engineering majors, and for those interested in engineering as a profession. Lec/lab. Has extra fees.
Recommended: Completion or concurrent enrollment in MTH 111

ECE 112. INTRODUCTION TO ECE: CONCEPTS. (3 Credits)
Basic electrical and computer engineering concepts, problem solving and hands-on laboratory project. Topics include electronic circuit and device models, digital logic, circuit analysis, and simulation tools. Lec/lab. Has extra fees.
Prerequisites: MTH 111 with C or better or MTH 112 with C or better or MTH 251 with C or better or MTH 251H with C or better or Math Placement Test with a score of 23

ECE 199. SPECIAL STUDIES. (0-16 Credits)
One-credit section. Graded P/N.
This course is repeatable for 16 credits.

ECE 271. DIGITAL LOGIC DESIGN. (3 Credits)
A first course in digital logic design. Data types and representations, Boolean algebra, state machines, simplification of switching expressions, and introductory computer arithmetic. Lec/rec.
Prerequisites: MTH 251 (may be taken concurrently) with C or better or MTH 251H (may be taken concurrently) with C or better or MTH 231 (may be taken concurrently) with C or better

ECE 272. DIGITAL LOGIC DESIGN LABORATORY. (1 Credit)
This laboratory course accompanies ECE 271, Digital Logic Design. This also illustrates topics covered in the lectures of ECE 271 using computer-aided design, verification tools, and prototyping hardware.
Recommended: Completion or concurrent enrollment in ECE 271

ECE 322. ELECTRONICS I. (3 Credits)
Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.
Prerequisites: ENGR 203 with C or better
Equivalent to: ECE 322H

ECE 322H. ELECTRONICS I. (3 Credits)
Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.
Attributes: HNRS – Honors Course Designator
Prerequisites: ENGR 203 with C or better
Equivalent to: ECE 322

ECE 323. ELECTRONICS II. (3 Credits)
Transient operation of MOSFETs and bipolar transistors; multistage amplifiers; frequency response; feedback and stability.
Prerequisites: ECE 322 with C or better

ECE 331. ELECTROMECHANICAL ENERGY CONVERSION. (4 Credits)
Energy conversion principles for electric machines. Steady state characteristics of direct current, induction, and synchronous machines. Application of stepper and servo motors and synchronous generators.
Prerequisites: (ENGR 202 with C or better or ENGR 202H with C or better) and MTH 256 [C] and PH 213 [C]

ECE 332. LABORATORY ON ELECTROMECHANICAL ENERGY CONVERSION. (1 Credit)
DC, PMAC, and induction machine testing, operation, and control.
Prerequisites: ENGR 202 with C or better or ENGR 202H with C or better
Corequisites: ECE 331

ECE 341. JUNIOR DESIGN I. (3 Credits)
Introduction to system design and group projects. Design and fabrication of an electrical engineering project in a small group.
Prerequisites: CS 261 (may be taken concurrently) with C or better and ENGR 203 [C]

ECE 342. JUNIOR DESIGN II. (3 Credits)
Introduction to system design and group projects. Design and fabrication of an electrical engineering project in a small group.
Prerequisites: ECE 341 with C or better

ECE 351. SIGNALS AND SYSTEMS I. (3 Credits)
Analytical techniques for continuous-time and discrete-time signal, system, and circuit analysis. Lec.
Prerequisites: ENGR 203 with C or better and (MTH 256 [C] or MTH 256H [C])

ECE 352. SIGNALS AND SYSTEMS II. (3 Credits)
Analytical techniques for continuous-time and discrete-time signal, system, and circuit analysis.
Prerequisites: ECE 351 with C or better and (MTH 306 [C] or MTH 306H [C])

ECE 353. INTRODUCTION TO PROBABILITY AND RANDOM SIGNALS. (3 Credits)
Introductory discrete and continuous probability concepts, single and multiple random variable distributions, expectation, introductory stochastic processes, correlation and power spectral density properties of random signals, random signals through linear filters. Lec.
Prerequisites: ECE 351 with C or better and (MTH 254 [C] or MTH 254H [C])

ECE 372. INTRODUCTION TO COMPUTER NETWORKS. (4 Credits)
Computer network principles, fundamental networking concepts, packet-switching and circuit switching, TCP/IP protocol layers, reliable data transfer, congestion control, flow control, packet forwarding and routing, MAC addressing, multiple access techniques. CROSSLISTED as CS 372/ ECE 372.
Prerequisites: CS 261 with C or better and (ECE 271 [C] or CS 271 [C])
Equivalent to: CS 372
Recommended: C programming and Unix familiarity.
ECE 375. COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING. (4 Credits)
Introduction to computer organization, how major components in a computer system function together in executing a program, and assembly language programming. Lec/lab.
Prerequisites: ECE 271 with C or better
Recommended: CS 261 or C/C++ programming

ECE 390. ELECTRIC AND MAGNETIC FIELDS. (4 Credits)
Static and quasi-static electric and magnetic fields.
Prerequisites: (MTH 255 with C or better or MTH 255H with C or better) and ENGR 203 (may be taken concurrently) [C] and PH 213 [C]

ECE 391. TRANSMISSION LINES. (3 Credits)
Transient and steady-state analysis of transmission line circuits with application to engineering problems.
Prerequisites: ECE 322 (may be taken concurrently) with C or better and ENGR 203 [C] and (MTH 254 [C] or MTH 254H [C]) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ECE 391X

ECE 399. SPECIAL TOPICS. (1-16 Credits)
Course work to meet students' needs in advanced or specialized areas and to introduce new, important topics in electrical and computer engineering at the undergraduate (junior/senior) level.
Equivalent to: ECE 399H
This course is repeatable for 16 credits.

ECE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 411. ENGINEERING MAGNETICS. (3 Credits)
Application of magnetic materials in the design of magnetic devices. Properties of magnetic materials; engineering design of actuators, sensors and data storage devices. Introduction to spintronics.
Prerequisites: ECE 390 with C or better

ECE 413. SENSORS. (3 Credits)
Overview of sensor technologies including materials, physics of operation, applications and system integration.
Prerequisites: ECE 323 with C or better and PH 213 [C] and (CH 201 [C] or CH 231 [C]) or (CH 121 [C] and CH 122 [C]) or (CH 231 [C] and CH 261 [C])

ECE 415. MATERIAL SCIENCE OF NANOTECHNOLOGY. (3 Credits)
Introductory physical chemistry of solid surfaces, thermodynamics, and kinetics applied to synthesis of nanomaterials such as nanoparticles, nanowires, thin films, carbon nanotubes, fullerenes, graphene, etc. Characterization of nanomaterials, applications of nanomaterials, nanosynthesis techniques, integration of nanotechnology, and emerging nanotechnology topics.
Prerequisites: ECE 416 with C or better or ENGR 321 with C or better or ENGR 321H with C or better

ECE 416. ELECTRONIC MATERIALS AND DEVICES. (4 Credits)
Semiconductor fundamentals and physical principles of pn junctions and Schottky barrier diodes.
Prerequisites: ENGR 201 with C or better and PH 213 [C] and (CH 201 [C] or CH 231 [C]) or (CH 231 [C] and CH 212 [C]) or (CH 231 [C] and CH 261 [C])
Equivalent to: ECE 317

ECE 417. BASIC SEMICONDUCTOR DEVICES. (4 Credits)
Theory and physical principles of bipolar junction and field-effect transistors. Lec/rec.
Prerequisites: ECE 416 with C or better

ECE 418. SEMICONDUCTOR PROCESSING. (4 Credits)
Theory and practice of basic semiconductor processing techniques. Introduction to process simulation. Lec/lab/rec.
Prerequisites: ECE 416 with C or better

ECE 422. CMOS INTEGRATED CIRCUITS I. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; current mirrors, gain stages, single-ended operational amplifier, frequency response, and compensation.
Prerequisites: ECE 322 with C or better and ECE 323 (may be taken concurrently) [C]

ECE 423. CMOS INTEGRATED CIRCUITS II. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; cascaded current mirrors, cascaded gain stages, single-ended and fully differential operational amplifier, common-mode feedback, noise, and distortion. Lec/lab.
Prerequisites: ECE 422 with C or better

ECE 431. POWER ELECTRONICS. (4 Credits)
Fundamentals and applications of devices, circuits and controllers used in systems for electronic power processing. Lec.
Prerequisites: ECE 322 with C or better and ECE 323 (may be taken concurrently) [C] and ECE 351 [C]

ECE 432. DYNAMICS OF ELECTROMECHANICAL ENERGY CONVERSION. (4 Credits)
Generalized machine theory. Techniques for dynamic analysis of electromechanical machines including arbitrary reference frame theory. Lec/lab.
Prerequisites: ECE 331 with C or better and ENGR 203 [C]
Corequisites: ECE 431

ECE 433. POWER SYSTEM ANALYSIS. (4 Credits)
Fundamentals and control of real and reactive power, steady-state load flow studies, unbalance, stability and transient system analysis.
Prerequisites: ECE 323 with C or better and ECE 352 [C] and (ENGR 202 [C] or ENGR 202H [C]) and MTH 254 [C] and MTH 306 [C]
Recommended: Three-phase power

ECE 437. SMART GRID. (3 Credits)
Fundamentals of smart power grids. Technology advances in transmission and distribution systems, policy drivers, assets and demand management, and smart grid security.
Prerequisites: ECE 433 with C or better
Recommended: Background in power systems analysis equivalent to ECE 433

ECE 438. ELECTRIC AND HYBRID ELECTRIC VEHICLES. (4 Credits)
Transportation electrification history, hybrid electric vehicle architecture, powertrain components and their modeling and control, vehicle system dynamics and controls.
Prerequisites: ECE 331 with C or better and ECE 431 [C]
ECE 441. *ENGINEERING DESIGN PROJECT. (3 Credits)
First term of an extended, 3-term team design project to expose students to problem situations and issues in engineering design similar to those encountered in industry. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECE 322 with C or better and ECE 351 [C] and ECE 342 [C]

ECE 442. *ENGINEERING DESIGN PROJECT. (3 Credits)
Second term of an extended, 3-term team design project to expose students to problem situations and issues in engineering design similar to those encountered in industry. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECE 441 with C or better

ECE 443. *ENGINEERING DESIGN PROJECT. (2 Credits)
An extended team design project to expose students to problem situations and issues in engineering design similar to those encountered in industry. (Writing Intensive Courses)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ECE 442 with C or better

ECE 451. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSLISTED as ECE 451/ME 430.
Prerequisites: (ME 317 with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C])))
Equivalent to: ECE 452, ME 430, ME 430H

ECE 461. INTRODUCTION TO ANALOG AND DIGITAL COMMUNICATIONS. (4 Credits)
Fundamental concepts of analog and digital telecommunication systems: modeling, analysis, and design of analog amplitude and angle modulation systems; probabilistic performance assessment of modulated signals over noisy channels; introduction to baseband digital modulation techniques such as binary pulse amplitude modulation and pulse position modulation and their demodulation in the presence of random noise. Lec.
Prerequisites: ECE 351 with C or better and ECE 352 [C] and ECE 353 [C]

ECE 462. DIGITAL COMMUNICATIONS AND CHANNEL CODING. (4 Credits)
Modeling, analysis, design of baseband and passband digital communications systems: geometric representation of signals; correlator receivers for M-ary digital communications systems; decision theory and its application to digital communication systems in additive white Gaussian noise environment; generation, transmission, and reception of passband digital modulated signals (BPSK, QPSK, FSK PAM); basics of information theory and channel encoding. Lec.
Prerequisites: ECE 461 with C or better and ECE 351 [C] and ECE 352 [C] and ECE 353 [C]

ECE 463. WIRELESS COMMUNICATIONS NETWORK. (4 Credits)
Wireless networks: personal area (IEEE 802.15.4a), local area (IEEE 802.11), metropolitan area (IEEE 802.16), and mobile cellular networks (e.g., CDMA); physical-layer techniques for data modulation and multiple access; RF system engineering aspects of mobile cellular networks (e.g., system capability for voice and packet data traffics, RF coverage for a certain propagation environment.) Lec.
Prerequisites: ECE 351 with C or better and ECE 352 [C]
Recommended: Probability background and ECE 461

ECE 464. DIGITAL SIGNAL PROCESSING. (4 Credits)
Analysis and design of discrete-time linear-time invariant systems for processing discrete-time signals: DT-LTI system properties, DT signal analysis using Discrete-Time Fourier Transform, Discrete Fourier Transform and z-Transform, frequency response and transfer function. Signal sampling and reconstruction, digital processing of continuous-time signals, FIR and IIR digital filter design, and filter structures.
Prerequisites: ECE 351 with C or better and ECE 352 [C]

ECE 468. DIGITAL IMAGE PROCESSING. (3 Credits)
Introduction to digital image processing including fundamental concepts of visual perception, image sampling and quantization, image enhancement in spatial and frequency domains (through 2D Fourier transform), image restoration, and color image processing. Implementation of algorithms using Matlab Image Processing Toolbox.
Prerequisites: ECE 351 with C or better and ECE 352 [C]

ECE 471. ENERGY-EFFICIENT VLSI DESIGN. (4 Credits)
Combinational and sequential logic design using CMOS transistors; analysis of power consumption and logic delay of digital logic; clock design including skew, jitter, and dynamic clock energy consumption; supply voltage and power supply noise sources; dynamic voltage frequency scaling (DVFS); sub-threshold logic design and effect on energy/robustness; custom digital integrated circuit design including transistor layouts and CAD entry; CMOS scaling and the effect on process variability and power consumption. Lec/lab.
Prerequisites: ECE 271 with C or better and ECE 322 [C] and ECE 323 (may be taken concurrently) [C]

ECE 472. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/ ECE 472 and CS 572/ECE 572.
Prerequisites: ECE 375 with C or better
Equivalent to: CS 472

ECE 473. MICROCONTROLLER SYSTEM DESIGN. (4 Credits)
Implementation of embedded computer systems focusing on the development of hardware and software for an embedded microcontroller system. Topics include internal microcontroller architecture, interfacing peripheral devices, mixed analog and digital systems, and hardware and software implementation of several systems using a microcontroller and peripherals. Lec/lab.
Prerequisites: ECE 322 with C or better and ECE 375 [C] and CS 261 [C]

ECE 474. VLSI SYSTEM DESIGN. (4 Credits)
Introduction to custom and semi-custom digital integrated circuit design as used in VLSI systems. The use of CAD/CAE tools, design management, and design methodology are introduced.
Prerequisites: ECE 322 with C or better and ECE 375 [C]

ECE 476. ADVANCED COMPUTER NETWORKING. (4 Credits)
Prerequisites: (CS 372 with C or better or ECE 372 with C or better) and (ECE 353 [C] or ST 314 [C] or ST 314H [C])
Equivalent to: CS 476, ECECS 476
ECE 477. MULTIMEDIA SYSTEMS. (4 Credits)
Design of multimedia systems used in information technology covering the hardware, software, applications, and networks. Components covered include multimedia representation, coding and compression techniques, wireless networks, networking for multimedia, and embedded system for multimedia. Lec.
Recommended: ECE 375

ECE 478. NETWORK SECURITY. (4 Credits)
Basic concepts and techniques in network security, risks and vulnerabilities, applied cryptography and various network security protocols. Coverage of high-level concepts such as authentication, confidentiality, integrity, and availability applied to networking systems. Fundamental techniques including authentication protocols, group key establishment and management, trusted intermediaries, public key infrastructures, SSL/TLS, IPSec, firewalls and intrusion detection CROSSLISTED as CS 478/ECE 478.
Prerequisites: CS 372 with C or better or ECE 372 with C or better
Equivalent to: CS 478
Recommended: CS 370

ECE 482. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: PH 482
Recommended: ECE 391 or (PH 481 or PH 581)

ECE 483. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Prerequisites: ECE 391 (may be taken concurrently) with C or better or PH 481 (may be taken concurrently) with C or better
Equivalent to: PH 483

ECE 484. ANTENNAS AND PROPAGATION. (4 Credits)
Introduction to antennas and radiowave propagation. Offered alternate years.
Prerequisites: (ECE 390 with C or better and ECE 391 [C])

ECE 485. MICROWAVE DESIGN TECHNIQUES. (4 Credits)
Introduction to basic design techniques required for the design of high-frequency circuits and systems. Lec/Lab.
Prerequisites: ECE 390 with C or better and ECE 391 [C]

ECE 499. SPECIAL TOPICS. (0-16 Credits)
Course work to meet students' needs in advanced or specialized areas and to introduce new important topics in electrical and computer engineering at the undergraduate level.
This course is repeatable for 16 credits.

ECE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 503. ECE MS THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ECE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ECE 510. OCCUPATIONAL INTERNSHIP. (1-4 Credits)
This course is repeatable for 99 credits.

ECE 516. ELECTRONIC MATERIALS AND DEVICES. (4 Credits)
Semiconductor fundamentals and physical principles of pn junctions and Schottky barrier diodes.
Equivalent to: ECE 317
Recommended: ENGR 201

ECE 517. BASIC SEMICONDUCTOR DEVICES. (4 Credits)
Theory and physical principles of bipolar junction and field-effect transistors. Lec/rec.
Recommended: ECE 416

ECE 518. SEMICONDUCTOR PROCESSING. (4 Credits)
Theory and practice of basic semiconductor processing techniques. Introduction to process simulation. Lec/lab/rec.
Recommended: ECE 416

ECE 520. ANALOG CMOS INTEGRATED CIRCUITS. (4 Credits)
Principles and techniques of design of electronic circuits with focus on a design methodology for analog integrated circuits. Practical aspects of using CAD tools in analyzing and laying out circuits will be discussed.

ECE 521. ANALOG CIRCUIT SIMULATION. (4 Credits)
Formulation/solution of circuit equations; sparse matrix techniques; DC, transient, sensitivity, noise and Fourier analyses; RF circuit simulation.
Recommended: ECE 423 or ECE 520

ECE 522. CMOS INTEGRATED CIRCUITS I. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; current mirrors, gain stages, single-ended operational amplifier, frequency response, and compensation.
Recommended: ECE 322 and completion or concurrent enrollment in ECE 323

ECE 523. CMOS INTEGRATED CIRCUITS II. (4 Credits)
Analysis and design of analog integrated circuits in CMOS technology; cascaded current mirrors, cascaded gain stages, single-ended and fully differential operational amplifier, common-mode feedback, noise, and distortion. Lec/lab.
Recommended: ECE 422 or ECE 522

ECE 530. CONTEMPORARY ENERGY APPLICATIONS. (4 Credits)
Contemporary energy issues and applications; fundamental physics of renewable energy sources (e.g. wind, wave, and solar), devices used to harvest energy from these sources, state-of-the-art renewable energy technology, power transmission, transformers, and energy storage.
Recommended: Matlab, basic circuit analysis with RLC components and diode

ECE 531. POWER ELECTRONICS. (4 Credits)
Fundamentals and applications of devices, circuits and controllers used in systems for electronic power processing. Lec/lab.
Recommended: ECE 322 and ECE 351 and completion or concurrent enrollment in ECE 323

ECE 532. DYNAMICS OF ELECTROMECHANICAL ENERGY CONVERSION. (4 Credits)
Generalized machine theory. Techniques for dynamic analysis of electromechanical machines including arbitrary reference frame theory.
Lec/lab.
Corequisites: ECE 531
Recommended: ECE 331

ECE 533. POWER SYSTEM ANALYSIS. (4 Credits)
Fundamentals and control of real and reactive power, steady-state load flow studies, unbalance, stability and transient system analysis.
Recommended: ECE 323 and ECE 352 and three-phase power
ECE 534. ADVANCED ELECTRICAL MACHINES. (3 Credits)
Development of models for the dynamic performance of all classes of electrical machines; synchronous, induction, permanent magnet and reluctance motors. Dynamic motor simulations.
Equivalent to: ECE 538
Recommended: ECE 530

ECE 535. ADJUSTABLE SPEED DRIVES AND MOTION CONTROL. (3 Credits)
Adjustable speed drives, associated power electronic converters, simulation and control. Lec.
Equivalent to: ECE 647
Recommended: ECE 530

ECE 536. POWER SYSTEM PROTECTION. (3 Credits)
Recommended: ECE 433 or ECE 533

ECE 537. SMART GRID. (3 Credits)
Fundamentals of smart power grids. Technology advances in transmission and distribution systems, policy drivers, assets and demand management, and smart grid security.
Recommended: Background in power systems analysis equivalent to ECE 433

ECE 538. ELECTRIC AND HYBRID ELECTRIC VEHICLES. (4 Credits)
Transportation electrification history, hybrid electric vehicle architecture, powertrain components and their modeling and control, vehicle system dynamics and controls.
Equivalent to: ECE 534
Recommended: ECE 331 and ECE 431

ECE 550. LINEAR SYSTEMS. (4 Credits)
Linear dynamic systems theory and modeling.
Recommended: ECE 351 and ECE 352

ECE 560. STOCHASTIC SIGNALS AND SYSTEMS. (4 Credits)
Stochastic processes, correlation functions, spectral analysis applicable to communication and control systems.
Recommended: ECE 461 or ECE 561

ECE 561. INTRODUCTION TO ANALOG AND DIGITAL COMMUNICATIONS. (4 Credits)
Fundamental concepts of analog and digital telecommunication systems: modeling, analysis, and design of analog amplitude and angle modulation systems; probabilistic performance assessment of modulated signals over noisy channels; introduction to baseband digital modulation techniques such as binary pulse amplitude modulation and pulse position modulation and their demodulation in the presence of random noise. Lec.
Recommended: ECE 351 and ECE 352 and ECE 353

ECE 562. DIGITAL COMMUNICATIONS AND CHANNEL CODING. (4 Credits)
Modeling, analysis, design of baseband and passband digital communications systems: geometric representation of signals; correlator receivers for M-ary digital communications systems; decision theory and its application to digital communication systems in additive white Gaussian noise environment; generation, transmission, and reception of passband digital modulated signals (BPSK, QPSK, FSK PAM); basics of information theory and channel encoding. Lec.
Recommended: ECE 461 and ECE 351 and ECE 352 and ECE 353

ECE 563. WIRELESS COMMUNICATIONS NETWORK. (4 Credits)
Wireless networks: personal area (IEEE 802.15.4a), local area (IEEE 802.11), metropolitan area (IEEE 802.16), and mobile cellular networks (e.g., CDMA); physical-layer techniques for data modulation and multiple access; RF system engineering aspects of mobile cellular networks (e.g., system capability for voice and packet data traffic, RF coverage for a certain propagation environment.) Lec.
Recommended: Probability background and ECE 461

ECE 564. DIGITAL SIGNAL PROCESSING. (4 Credits)
Analysis and design of discrete-time linear-time invariant systems for processing discrete-time signals: DT-LTI system properties, DT signal analysis using Discrete-Time Fourier Transform, Discrete Fourier Transform and z-Transform, frequency response and transfer function. Signal sampling and reconstruction, digital processing of continuous-time signals, FIR and IIR digital filter design, and filter structures.
Recommended: ECE 351 and ECE 352

ECE 565. ESTIMATION, FILTERING, AND DETECTION. (4 Credits)
Principles of estimation, linear filtering, and detection.
Recommended: ECE 353

ECE 566. INFORMATION THEORY. (4 Credits)
Introduction to information theory: entropy, differential entropy, entropy rates, mutual information, data compression, channel capacity, source coding, channel coding, network information theory.
Recommended: ECE 353 and strong mathematical background

ECE 569. CONVEX OPTIMIZATION. (4 Credits)
Introduces the fundamental concepts, theories of convex and nonconvex optimization, and the algorithmic solutions as well as applications to many research disciplines including signal processing, networking, communications, and machine learning. Emphasis will be on (i) convex analysis and optimality conditions, (ii) first-order large-scale algorithms (gradient, proximal gradient, ADMM, Frank-Wolfe, stochastic gradient, block coordinate descent), and (iii) convergence analysis.
Recommended: Linear algebra and ECE 599 Matrix Analysis for Signal Processing

ECE 570. HIGH PERFORMANCE COMPUTER ARCHITECTURE. (4 Credits)
Advanced concepts in computer architecture. Performance improvement employing advanced pipelining and multiple instruction scheduling techniques. Issues in memory hierarchy and management. CROSSTLISTED as CS 570/ECE 570.
Equivalent to: CS 570
Recommended: ECE 472 or ECE 572

ECE 571. ENERGY-EFFICIENT VLSI DESIGN. (4 Credits)
Combinational and sequential logic design using CMOS transistors; analysis of power consumption and logic delay of digital logic; clock design including skew, jitter, and dynamic clock energy consumption; supply voltage and power supply noise sources; dynamic voltage frequency and scaling (DVFS); sub-threshold logic design and effect on energy/robustness; custom digital integrated circuit design including transistor layouts and CAD entry; CMOS scaling and the effect on process variability and power consumption. Lec/lab.
Equivalent to: ECE 573
Recommended: ECE 271 and ECE 322 and completion or concurrent enrollment in ECE 323 (all with a minimum grade of C)
ECE 572. COMPUTER ARCHITECTURE. (4 Credits)
Computer architecture using processors, memories, and I/O devices as building blocks. Issues involved in the design of instruction set architecture, processor, pipelining and memory organization. Design philosophies and trade-offs involved in Reduced Instruction Set Computer (RISC) architectures. Lec/lab. CROSSLISTED as CS 472/ECE 472 and CS 572/ECE 572.
Equivalent to: CS 572
Recommended: ECE 375

ECE 573. MICROCONTROLLER SYSTEM DESIGN. (4 Credits)
Implementation of embedded computer systems focusing on the development of hardware and software for an embedded microcontroller system. Topics include internal microcontroller architecture, interfacing peripheral devices, mixed analog and digital systems, and hardware and software implementation of several systems using a microcontroller and peripherals. Lec/lab.
Equivalent to: ECE 571
Recommended: ECE 322 and ECE 375 and CS 261

ECE 574. VLSI SYSTEM DESIGN. (4 Credits)
Introduction to custom and semi-custom digital integrated circuit design as used in VLSI systems. The use of CAD/CAE tools, design management, and design methodology are introduced.
Recommended: ECE 322 or ECE 375

ECE 575. DATA SECURITY AND CRYPTOGRAPHY. (3 Credits)
Secret-key and public-key cryptography, authentication and digital signatures, protocols, implementation issues, privacy enhanced mail, data and communication security standards.

ECE 576. ADVANCED COMPUTER NETWORKING. (4 Credits)
Equivalent to: CS 576, ECE 566
Recommended: (CS 372 or ECE 372) and (ECE 353 or ST 314 or ST 314H)

ECE 577. MULTIMEDIA SYSTEMS. (4 Credits)
Design of multimedia systems for information technology covering the hardware, software, applications, and networks. Components covered include multimedia representation, coding and compression techniques, wireless networks, networking for multimedia, and embedded system for multimedia. Lec.
Recommended: ECE 375

ECE 578. CYBER-SECURITY. (4 Credits)
A broad overview of the field of computer and network security. Essential cryptographic mechanisms such as symmetric and public-key cryptography (e.g., encryption, signatures), network security and authentication protocols (e.g., Kerberos, TLS, IPSec), system security (e.g., access control, firewalls), advanced topics (e.g., searchable encryption, cloud security, secure computation). CROSSLISTED as CS 578/ECE 578.
Equivalent to: CS 578

ECE 580. NETWORK THEORY. (4 Credits)
Linear graphs, multiport networks, and other topics in advanced network theory.

ECE 582. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: PH 582
Recommended: PH 481 or PH 581

ECE 583. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Equivalent to: PH 583
Recommended: Completion or concurrent enrollment in (ECE 391 or PH 481 or PH 581)

ECE 584. ANTENNAS AND PROPAGATION. (4 Credits)
Introduction to antennas and radiowave propagation. Offered alternate years.

ECE 585. MICROWAVE DESIGN TECHNIQUES. (4 Credits)
Introduction to basic design techniques required for the design of high-frequency circuits and systems. Lec/Lab.

ECE 590. ANALYTICAL TECHNIQUES IN ELECTROMAGNETIC FIELDS. (4 Credits)
Basic analytical techniques required to solve meaningful field problems in engineering.

ECE 591. ADVANCED ELECTROMAGNETICS. (3 Credits)
Advanced techniques for analyzing problems in electromagnetics, primarily numerical. Offered alternate years.
Recommended: ECE 590

ECE 593. RF MICROWAVE CIRCUIT DESIGN. (3 Credits)
Active/passive RF and microwave circuit design with emphasis to wireless systems.
Recommended: ECE 390 and ECE 391

ECE 599. SPECIAL TOPICS. (0-16 Credits)
Course work to meet students' needs in advanced or specialized areas and to introduce new important topics in electrical and computer engineering at the graduate level. 
This course is repeatable for 99 credits.

ECE 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 603. ECE PhD THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ECE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ECE 611. ELECTRONIC MATERIALS PROCESSING. (3 Credits)
Technology, theory, and analysis of processing methods used in integration circuit fabrication. Offered alternate years. CROSSLISTED as CHE 611/ECE 611.
Equivalent to: CHE 611, ECE 511

ECE 612. PROCESS INTEGRATION. (3 Credits)
Process integration, simulation, and statistical quality control issues related to integrated circuit fabrication. Offered alternate years. CROSSLISTED as CHE 612/ECE 612.
Equivalent to: CHE 612, ECE 512
Recommended: ECE 611 or CHE 611
ECE 613. ELECTRONIC MATERIALS AND CHARACTERIZATION. (3 Credits)
Physics and chemistry of electronic materials and methods of materials characterization. Offered alternate years. CROSSLISTED as CHE 613/ECE 613.
Equivalent to: CHE 613, ECE 513
ECE 614. SEMICONDUCTORS. (3 Credits)
Essential aspects of semiconductor physics relevant for an advanced understanding of semiconductor materials and devices. Offered alternate years.
Equivalent to: ECE 514
Recommended: Exposure to quantum mechanics and solid state physics.
ECE 615. SEMICONDUCTOR DEVICES I. (3 Credits)
Advanced treatment of two-terminal semiconductor electronic devices. Offered alternate years.
Equivalent to: ECE 515
Recommended: ECE 614
ECE 616. SEMICONDUCTOR DEVICES II. (3 Credits)
Advanced treatment of three-terminal semiconductor electronic devices. Offered alternate years.
Equivalent to: ECE 516
Recommended: ECE 615
ECE 617. THIN FILM TRANSISTORS. (4 Credits)
Thin-film electronics typically necessitate semiconducting materials lacking long-range order (disordered semiconductors), and hence provide a range of challenges and opportunities for device engineers. Provides a comprehensive review of the device physics and materials science of thin film electronics — in particular thin-film transistors. Provides students with the theoretical and practical knowledge to be successful in the development and study of thin film transistors, in both academic and industrial environments.
Recommended: ECE 390, ECE 416/ECE516, ECE 417/ECE 517, ECE 614
ECE 619. SELECTED TOPICS IN SOLID STATE. (3 Credits)
Special courses taught on various topics in solid state as interests and demands vary. This course is repeatable for 99 credits.
ECE 621. RADIO FREQUENCY IC DESIGN. (3 Credits)
Radio frequency (RF) circuits. Principles, analysis, and design of bipolar and MOS RF IC building blocks: low noise amplifiers, mixers, oscillators, frequency synthesizers.
Recommended: (ECE 422 or ECE 522) and (ECE 423 or ECE 523) or ECE 520
ECE 626. ANALOG CMOS CIRCUIT DESIGN. (3 Credits)
Switched-capacitor circuit design, on-chip filters, data converters. Practical aspects of analog CMOS IC design.
ECE 627. OVERSAMPLED DELTA-SIGMA DATA CONVERTERS. (3 Credits)
Noise-shaping theory in first, second, and higher-order modulators. Design, simulation, and realization in hardware of converters using this popular architecture.
ECE 629. SELECTED TOPICS IN MICROELECTRONICS. (3 Credits)
Course work to meet student's needs in advanced or specialized areas and to introduce the newest important results in microelectronics.
ECE 659. SELECTED TOPICS IN SYSTEMS AND CONTROL. (3 Credits)
Course work to meet students' needs in advanced or specialized areas and to introduce the newest important results in systems and control. This course is repeatable for 18 credits.

ESE 330. MODELING AND ANALYSIS OF DYNAMIC SYSTEMS. (4 Credits)
Presents basic concepts of dynamic behavior, and the analytical and computational techniques for predicting and assessing dynamic behavior. Modeling a basic system, compound system, dynamic stability, and natural behavior to continuing and abrupt inputs are presented. Prerequisites: ENGR 202 with C or better and ENGR 212 [C] and MTH 256 [C] and MTH 306 [C]
ESE 355. ENERGY REGULATION. (4 Credits)
Introductory course to the policies and laws governing energy generation and transmission in the United States with a focus on electricity. History of regulations give context to understand current regulation and potential future policies. Laws regulating the use of alternative energy resources covered in a practical setting. Offered at OSU-Cascades only. Prerequisites: BA 360 (may be taken concurrently) with C or better or ENGR 390 (may be taken concurrently) with C or better
ESE 360. ENERGY CONSUMPTION ANALYSIS. (4 Credits)
Analysis of energy use in transportation, residential and industrial sectors to understand how new technologies improve energy efficiency. Tradeoff techniques applied to decide between less efficient, less expensive systems versus more efficient, more expensive systems. International energy consumption compared, and energy losses evaluated for heating, cooling and electronic systems. Offered at OSU-Cascades only. Prerequisites: BA 360 (may be taken concurrently) with C or better or ENGR 390 (may be taken concurrently) with C or better and ME 311 [C]
ESE 430. FEEDBACK CONTROL SYSTEMS. (4 Credits)
Modeling and analysis of linear, continuous-time systems in the time and frequency domains. Fundamentals of single-input-single-output control system design using both time-domain and frequency-domain techniques. Prerequisites: ESE 330 with C or better
ESE 450. ENERGY GENERATION SYSTEMS. (4 Credits)
Survey of technical fundamentals and operational principles of conventional and renewable energy conversion systems to understand the environmental and sustainable issues for energy systems currently in use or may be used in the future to power our industrial society. Offered at OSU-Cascades only. Prerequisites: ME 312 with C or better
**ESE 470. ENERGY DISTRIBUTION SYSTEMS. (4 Credits)**
Detailed coverage of the electrical energy distribution system, its operation, control and design. Design considerations and impacts to meet emerging and evolving customer needs. Broader understanding of natural gas and oil pipeline distribution for these infrastructure commodities. Offered at OSU-Cascades only.
Prerequisites: ENGR 202 with C or better and ME 311 [C]

**ESE 471. ENERGY STORAGE SYSTEMS. (4 Credits)**
Coverage of energy storage techniques involving electrochemical, mechanical and emerging options. Integration of the energy storage media, its effects on the bulk power system, and design tradeoffs to understand environmental impacts, cost, reliabilities, and efficiencies for commercialization of bulk energy storage. Offered at OSU-Cascades only.
Prerequisites: ENGR 202 with C or better and ME 312 [C]

**ESE 497. *MIME CAPSTONE DESIGN. (4 Credits)**
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ((ENGR 390 with C or better or BA 360 with C or better) and IE 425 [C] and (ME 312 [C] or ME 312H [C]) and (ME 331 [C] or ME 331H [C]) and ESE 355 [C] and ESE 360 [C] and WR 327 [C] and (ST 314 [C] or ST 314H [C]) and)
Equivalent to: IE 497, ME 497, MIME 497

**ESE 498. *MIME CAPSTONE DESIGN. (4 Credits)**
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: ESE 497 with C or better or IE 497 with C or better or ME 497 with C or better or MIME 497 with C or better
Equivalent to: IE 498, ME 498

**ESE 499. SPECIAL TOPICS. (0-16 Credits)**
This course is repeatable for 16 credits.

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**Engineering Science (ENGR)**

**ENGR 003. UNDERGRADUATE RESEARCH. (0 Credits)**
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

**ENGR 101. DESIGN OF COFFEE. (2 Credits)**
Roast coffee beans and brew and taste coffee while using engineering design to create the perfect cup of coffee using the least amount of electricity. Lec/rec.

**ENGR 111. ENGINEERING ORIENTATION I. (3 Credits)**
Engineering as a profession, historical development, ethics, curricula and engineering careers. Introduction to problem analysis and solution, data collection, accuracy and variability. Lec/rec.
Equivalent to: ENGR 111H

**ENGR 112. INTRODUCTION TO ENGINEERING COMPUTING. (3 Credits)**
Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software. Lec/lab/rec.
Equivalent to: ENGR 112H, ENGR 112H

**ENGR 112H. INTRODUCTION TO ENGINEERING COMPUTING. (3 Credits)**
Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software. Lec/lab/rec.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 112

**ENGR 199. SPECIAL TOPICS. (0-16 Credits)**
Graded P/N.
Equivalent to: ENGR 199H

This course is repeatable for 16 credits.

**ENGR 201. ELECTRICAL FUNDAMENTALS I. (3 Credits)**
Prerequisites: (MTH 251 with C or better or MTH 251H with C or better) and (MTH 252 [C] or MTH 252H [C])
Equivalent to: ENGR 201H

**ENGR 201H. ELECTRICAL FUNDAMENTALS I. (3 Credits)**
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 251 with C or better or MTH 251H with C or better) and (MTH 252 [C] or MTH 252H [C])
Equivalent to: ENGR 201

**ENGR 202. ELECTRICAL FUNDAMENTALS II. (3 Credits)**
Sinusoidal steady-state analysis and phasors. Application of circuit analysis to solve single-phase and three-phase circuits including power, mutual inductance, transformers and passive filters. Lec/lab.
Prerequisites: ENGR 201 with C or better or ENGR 201H with C or better
Equivalent to: ENGR 202H

**ENGR 203. ELECTRICAL FUNDAMENTALS III. (3 Credits)**
Laplace transforms, Fourier series, Bode plots, and their application to circuit analysis.
Prerequisites: (ENGR 201 with C or better or ENGR 201H with C or better) and (ENGR 202 [C] or ENGR 202H [C]) and (MTH 256 [C] or MTH 256H [C])

**ENGR 211. STATICS. (3 Credits)**
Analysis of forces induced in structures and machines by various types of loading. Lec/rec.
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: ENGR 211H

**ENGR 211H. STATICS. (3 Credits)**
Analysis of forces induced in structures and machines by various types of loading. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C or better or MTH 252H with C or better
Equivalent to: ENGR 211

**ENGR 212. DYNAMICS. (3 Credits)**
Kinematics, Newton’s laws of motion, and work-energy and impulse-momentum relationships applied to engineering systems. Lec/rec.
Prerequisites: (ENGR 211 with C or better or ENGR 211H with C or better) and (PH 211 [C] or PH 211H [C])
Equivalent to: ENGR 212H

**ENGR 212H. DYNAMICS. (3 Credits)**
Kinematics, Newton’s laws of motion, and work-energy and impulse-momentum relationships applied to engineering systems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 211 with C or better or ENGR 211H with C or better) and (PH 211 [C] or PH 211H [C])
Equivalent to: ENGR 212
ENGR 213. STRENGTH OF MATERIALS. (3 Credits)
Properties of structural materials; analysis of stress and deformation in axially loaded members, circular shafts, and beams, and in statically indeterminate systems containing these components. Lec/rec.
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better
Equivalent to: ENGR 213H

ENGR 213H. STRENGTH OF MATERIALS. (3 Credits)
Properties of structural materials; analysis of stress and deformation in axially loaded members, circular shafts, and beams, and in statically indeterminate systems containing these components. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: ENGR 211 with C or better or ENGR 211H with C or better
Equivalent to: ENGR 213

ENGR 221. THE SCIENCE, ENGINEERING AND SOCIAL IMPACT OF NANOTECHNOLOGY. (3 Credits)
Nanotechnology is an emerging engineering field that manipulates atoms and molecules to fabricate new materials and tiny devices. Properties of nanostructured materials, manufacturing methods, characterization methods, and impact on health and safety. Benefits and concerns about nanotechnology will be assessed. Lec/rec. CROSSLISTED as ENG 221/ MATH 221.
Equivalent to: MATH 221
Recommended: One year of college science.
ENGR 248. ENGINEERING GRAPHICS AND 3-D MODELING. (3 Credits)
Introduction to graphical communication theory, including freehand sketching techniques, geometric construction, multi-view, pictorial, sectional and auxiliary view representation and dimensioning techniques. Practical application of theoretical concepts using solid modeling software to capture design intent and generate engineering drawings. Lec/Lab.

ENGR 299. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.
ENGR 299H. SPECIAL TOPICS. (0-16 Credits)
 Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 299
This course is repeatable for 16 credits.
ENGR 350. SUSTAINABLE ENGINEERING. (3 Credits)
Examination of technological innovations and alternatives required to maintain human quality of life and environmental sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: ENGR 350H

ENGR 350H. SUSTAINABLE ENGINEERING. (3 Credits)
Examination of technological innovations and alternatives required to maintain human quality of life and environmental sustainability. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ENGR 350

ENGR 352. CREATIVE COLLABORATION: DESIGNING AND BUILDING. (3 Credits)
Working in multi-disciplinary teams, design, implement, and document a piece of public art work or science museum display. Projects may be made of any media, but must demonstrate creativity both in the engineering used to create them and the technology and society message they convey. CROSSLISTED as ART 352/ENGR 352. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ART 352

ENGR 363. ENERGY MATTERS. (3 Credits)
Establishes a basic energy vocabulary, applies the fundamental concepts of identifying energy use and determining efficiency, and studies the implications of energy decisions in the context of traditional, alternative, and sustainable energy resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: ENGR 363H
Recommended: MTH 112 or higher
ENGR 363H. ENERGY MATTERS. (3 Credits)
Establishes a basic energy vocabulary, applies the fundamental concepts of identifying energy and determining efficiency, and studies the implications of energy decisions in the context of traditional, alternative, and sustainable energy resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: ENGR 363
Recommended: MTH 112 or higher
ENGR 390. ENGINEERING ECONOMY. (3 Credits)
Time value of money; economic study techniques, depreciation, taxes, retirement, and replacement of engineering facilities.
ENGR 391. ENGINEERING ECONOMICS AND PROJECT MANAGEMENT. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Economic, time, and performance parameters of engineering projects are analyzed from the organizational and resource perspectives. Network optimization and simulation concepts are introduced. Fundamental engineering economics concepts are introduced and applied to planning and managing projects.
Equivalent to: ENGR 391H
ENGR 391H. ENGINEERING ECONOMICS AND PROJECT MANAGEMENT. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Economic, time, and performance parameters of engineering projects are analyzed from the organizational and resource perspectives. Network optimization and simulation concepts are introduced. Fundamental engineering economics concepts are introduced and applied to planning and managing projects.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 391
ENGR 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
ENGR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 399
This course is repeatable for 16 credits.
ENGR 499H. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ENGR 499
This course is repeatable for 16 credits.

ENGR 450. PROFESSIONAL PREPARATION FOR BEGINNING LEVEL ENGINEERS. (1 Credit)
Practical training on professional skills essential for a career as a practicing engineer. Covers development of networking and interviewing skills, preparation of a resume, job search strategies and guidance on future professional development.

ENGR 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ENGR 499H
This course is repeatable for 16 credits.

ENGR 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENGR 499
This course is repeatable for 16 credits.

ENGR 531. APPLIED IMAGING AND IMAGE PROCESSING. (3 Credits)
Explore image formats, storage issues, characteristics and significance of histograms; define and explain image artifacts such as random and periodic noise. Implement different image processing operations such as filters, registration, and mathematical algorithms to enhance an image and facilitate subsequent segmentation such as histogram thresholding, cluster analysis, watershed analysis, etc. Make quantitative measurements from images, such as length, area, orientation, connectivity, anisotropy, and perimeter of objects, as well as porosities, surface areas and curvatures. Apply advanced image analysis via skeletonization, morphological/ topological analysis, surface generation/ triangulation etc.
This course is repeatable for 3 credits.
Recommended: Introductory preparation in mathematical analysis, vectors, matrices, probability, statistics, linear systems, and computer programming

ENGR 550. PROFESSIONAL PREPARATION FOR ENGINEERS. (1 Credit)
Practical training on professional skills essential for a career as a practicing engineer. Covers development of networking and interviewing skills, preparation of a resume and related online media, and guidance on future professional development. As this is a graduate-level course, it will include guidance on how students can develop and present themselves in ways that differentiate their abilities from those of more junior engineers.

ENGR 555. FOUNDATIONS OF ENGINEERING EDUCATION RESEARCH AND PRACTICE. (3 Credits)
An examination as to why engineering education is practiced and researched the way that it is through reading, discussion and writing. The focus of the course will be on written and verbal interactions informed by careful reading of assigned texts.

ENGR 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

English (ENG)

ENG 104. *INTRODUCTION TO LITERATURE: FICTION. (3 Credits)
Study of fiction for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 104H

ENG 104H. *INTRODUCTION TO LITERATURE: FICTION. (3 Credits)
Study of fiction for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 104

ENG 105. *INTRODUCTION TO LITERATURE: DRAMA. (3 Credits)
Study of drama for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core

ENG 106. *INTRODUCTION TO LITERATURE: POETRY. (3 Credits)
Study of poetry for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 106H

ENG 106H. *INTRODUCTION TO LITERATURE: POETRY. (3 Credits)
Study of poetry for greater understanding and enjoyment. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 106

ENG 107. *INTRODUCTION TO LITERATURE: CREATIVE NONFICTION. (3 Credits)
An introduction to the study of creative nonfiction as a diverse genre, from journalism to memoir and essay. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Recommended: WR 121

ENG 108. *INTRODUCTION TO SCIENCE FICTION AND FANTASY. (3 Credits)
Focuses on modern and contemporary examples of science fiction and fantasy with some attention paid to the roots of the genres (myths, folklore, and fairy tales). Hypothesizes that both genres reflect the anxieties and aspirations of the eras that produce and consume them. Introduces students to a range of modern classics, including contemporary science fiction and fantasy written by women and people of color. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ENG 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 200. LIBRARY SKILLS FOR LITERARY STUDY. (1 Credit)
Introduction to library resources for the study of literature. Required for English majors.

ENG 201. *SHAKESPEARE. (4 Credits)
The earlier plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 201H
ENG 201H. *SHAKESPEARE. (4 Credits)
The earlier plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 201

ENG 202. *SHAKESPEARE. (4 Credits)
The later plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 202H

ENG 202H. *SHAKESPEARE. (4 Credits)
The later plays. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 202

ENG 204. *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 204H

ENG 204H. *SURVEY OF BRITISH LITERATURE: BEGINNINGS TO 1660. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 204

ENG 205. *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 205H, ENG 205H

ENG 205H. *SURVEY OF BRITISH LITERATURE: RESTORATION TO ROMANTIC ERA. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 205

ENG 206. *SURVEY OF BRITISH LITERATURE: VICTORIAN ERA TO 20TH CENTURY. (4 Credits)
English literature presented in chronological sequence. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 206H

ENG 207. *LITERATURE OF WESTERN CIVILIZATION: CLASSICAL-RENAISSANCE. (4 Credits)
The great plays, poems and fiction of Western civilization. Covers the Classical World: (Greek, Hebrew, Roman) and Western European major authors through the Renaissance. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 208. *LITERATURE OF WESTERN CIVILIZATION: 18TH CENTURY TO PRESENT. (4 Credits)
The great plays, poems and prose of Western civilization from the 18th century Enlightenment through Romanticism and beyond. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 210. *LITERATURES OF THE WORLD: ASIA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Asia. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 211. *LITERATURES OF THE WORLD: AFRICA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 211H. *LITS OF THE WORLD: AFRICA. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 212. *LITERATURES OF THE WORLD: MESO/SOUTH AMERICA, CARIBBEAN. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of Meso- and South America and the Caribbean. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 213. *LITERATURES OF THE WORLD: MIDDLE EAST. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of the Middle East. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 213H

ENG 213H. *LITERATURES OF THE WORLD: MIDDLE EAST. (4 Credits)
Representative works of poetry, prose, and drama from nonwestern cultural traditions. Covers literature of the Middle East. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

Equivalent to: ENG 213
ENG 214. *LITERATURE OF THE WORLD: EUROPE. (4 Credits)
Representative works of poetry, prose, and drama written by European authors. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture

ENG 215. *CLASSICAL MYTHOLOGY. (4 Credits)
Greek and Roman mythology, its allusions, continuing influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 220. *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
A comparative treatment of literary topics in the context of institutional and systematic discrimination. Not offered every year. CROSSLISTED as ENG 220/FILM 220. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 220H, FILM 220

ENG 220H. *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
A comparative treatment of literary topics in the context of institutional and systematic discrimination. Not offered every year. CROSSLISTED as ENG 220/FILM 220. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 220, FILM 220

ENG 221. *AFRICAN-AMERICAN LITERATURE. (4 Credits)
Reading and critical analysis of African-American literature in historical, political, and/or thematic perspective. Content changes from term to term. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 221H
This course is repeatable for 8 credits.

ENG 221H. *AFRICAN-AMERICAN LITERATURE. (4 Credits)
Reading and critical analysis of African-American literature in historical, political, and/or thematic perspective. Content changes from term to term. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 221
This course is repeatable for 8 credits.

ENG 222. CHILDREN'S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales, and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.

ENG 225. THE ART, SCIENCE, AND LITERATURE OF FLY FISHING. (1 Credit)
Designed to rapidly introduce students to some of the major themes and formal devices of literature written about fly fishing. In four days, we will gain a sense of how four different genres—the short story, the novel, poetry, and creative nonfiction—represent and understand this activity.
Corequisites: FW 112, PAC 331

ENG 230X. HUMANS AND THE OCEAN. (3 Credits)
An introduction to marine science and the history of humans’ interaction with the ocean. Lectures, group and individual library research, fieldtrips, and assignments will collate approaches from marine science, history, literary study, and other scientific and humanistic disciplines to introduce course material. Topics include oceanographic exploration, fishing and overfishing, and marine pollution. CROSSLISTED as ENG 230X/FW 230X/TOX 230X.
Equivalent to: FW 230X, TOX 230X

ENG 240. *INTRODUCTION TO ENVIRONMENTAL LITERATURE. (4 Credits)
An exploration of the key figures, themes, theories, and works of American environmental literature. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ENG 253. *SURVEY OF AMERICAN LITERATURE: COLONIAL TO 1900. (4 Credits)
Readings from American literature presented in chronological sequence, important eras and movements with emphasis on major writers. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 254. *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT. (4 Credits)
Readings from American literature presented in chronological sequence, important eras and movements with emphasis on major writers. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 254H

ENG 254H. *SURVEY OF AMERICAN LITERATURE: 1900 TO PRESENT. (4 Credits)
Readings from American literature presented in chronological sequence, important eras and movements with emphasis on major writers. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 254

ENG 260. *LITERATURE OF AMERICAN MINORITIES. (4 Credits)
Study of the literature of American minorities: North American Indian, black, Chicano/Chicana, Asian, Middle Eastern, gay and lesbian. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 260H

ENG 260H. *LITERATURE OF AMERICAN MINORITIES. (4 Credits)
Study of the literature of American minorities: North American Indian, black, Chicano/Chicana, Asian, Middle Eastern, gay and lesbian. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 260

ENG 275. *THE BIBLE AS LITERATURE. (4 Credits)
Biblical structure, literary types, ideas, influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 275H
ENG 275H. *THE BIBLE AS LITERATURE. (4 Credits)
Biblical structure, literary types, ideas, influences. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 275

ENG 295. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, physical identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENG 295H, PHL 295, PHL 295H, WGSS 295, WGSS 295H

ENG 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, physical identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, PHL 295, PHL 295H, WGSS 295, WGSS 295H

ENG 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 304. CAREER PREPARATION FOR ENGLISH MAJORS. (2 Credits)
Introduces students majoring in English to tasks and processes needed to successfully prepare for a future career. Includes exercises in self-reflection, guidance in exploring professional options and networking, and feedback on job-seeking materials.
Prerequisites: ENG 301 with D- or better

ENG 311. *STUDIES IN BRITISH PROSE. (4 Credits)
An introduction to the prose genre in British literature with intensive practice in reading and writing practices for literary study. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ENG 317. *THE AMERICAN NOVEL: BEGINNINGS TO CHOPIN. (4 Credits)
Chronological survey of the novel in America. Covers from the beginnings to Chopin. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 318. *THE AMERICAN NOVEL: MODERNIST PERIOD. (4 Credits)
Chronological survey of the novel in America. Covers Modernist Period from Dreiser to Faulkner. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 319. *THE AMERICAN NOVEL: POST-WORLD WAR II. (4 Credits)
Chronological survey of the novel in America. Covers Post-World War II: Mailer to the present. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

ENG 320. *STUDIES IN PAGE, STAGE, AND SCREEN. (4 Credits)
Study of a particular theme, genre, movement, or author through the relations of text and performance. Topics change from term to term and may include content from film, drama, digital sources, and other visual media. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.

ENG 321. *STUDIES IN WORD, OBJECT, AND IMAGE. (4 Credits)
Study of a particular theme, genre, movement, or author through the relations of texts to material artifacts and/or static visual objects (e.g., paintings, engravings, printed matter, or photographs). Topics change from term to term. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
This course is repeatable for 8 credits.

ENG 322. *STUDIES IN GLOBALISM, TEXT, AND EVENT. (4 Credits)
Study of a particular theme, genre, movement, or author as informed by patterns of globalization, issues in international relations, and/or landmark moments of cultural exchange. Topics change from term to term. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CSGI – Core, Synth, Global Issues
This course is repeatable for 8 credits.

ENG 330. *THE HOLOCAUST IN LITERATURE AND FILM. (4 Credits)
Study of fiction, memoir, and film representing Nazi Holocaust of European Jewry. Reviews history of racial Anti-Semitism and rise of Nazism as context for textual analysis of Holocaust literature. Examines literary and filmic form as productive to social awareness of the roots, events, and aftermath of the Holocaust. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

ENG 345. INTRODUCTION TO LITERARY CRITICISM AND THEORY. (4 Credits)
Study and analysis of critical frameworks and methodologies for the interpretation of literature and culture. Required for English majors. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: ENG 200 with C- or better

ENG 360. *NATIVE AMERICAN LITERATURE. (4 Credits)
An introduction to the prose and poetry written by Native Americans of the North American continent. Not offered every year. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ENG 362. *AMERICAN WOMEN WRITERS. (4 Credits)
Study of important literary works of any genre by American women from historical, thematic, or formalist perspectives. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core

ENG 362H

ENG 374. *MODERN SHORT STORY. (4 Credits)
Survey of the short story from the 19th century to the present. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core

ENG 374H. *MODERN SHORT STORY. (4 Credits)
Survey of the short story from the 19th century to the present. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core

ENG 375. CHILDREN’S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales, and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.
Equivalent to: ENG 375H
ENG 375H. CHILDREN'S LITERATURE. (4 Credits)
Surveys a variety of genres, including fairy tales, folktales and fables, nonsense poetry, picture books, historical and fantasy novels, examining how these texts represent childhood and connect with historical, cultural, and psychological contexts.
Attributes: HNRS – Honors Course Designator
Equivalent to: ENG 375

ENG 386. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART I. (4 Credits)
The first course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Conquest to Civil War. CROSSLISTED as ART 386/ENG 386.
Equivalent to: ART 386

ENG 387. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART II. (4 Credits)
The second course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Civil War to Harlem Renaissance. CROSSLISTED as ART 387/ENG 387.
Equivalent to: ART 387

ENG 388. A CULTURAL HISTORY OF AMERICAN ART AND LITERATURE: PART III. (4 Credits)
The third course in an interdisciplinary sequence that examines the development and interrelationships of American art and literature from contact to the present. Covers Great Depression to Postmodernity. CROSSLISTED as ART 388/ENG 388.
Equivalent to: ART 388

ENG 399. SELECTED TOPICS. (1-16 Credits)
(H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: ENG 399
This course is repeatable for 16 credits.

ENG 399H. SELECTED TOPICS. (1-16 Credits)
(H)
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 399
This course is repeatable for 16 credits.

ENG 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 406. PROJECTS. (1-16 Credits)
Equivalent to: ENG 406H
This course is repeatable for 16 credits.

ENG 406H. PROJECTS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENG 406
This course is repeatable for 16 credits.

ENG 407. *SEMINAR. (1-16 Credits)
CROSSLISTED as AMS 407/ENG 407. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ENG 407H
This course is repeatable for 16 credits.

ENG 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 410. INTERNSHIP IN ENGLISH. (1-16 Credits)
Provides upper-division English majors with supervised, on-the-job work experience, accompanying academic readings. Graded P/N.
This course is repeatable for 16 credits.
Recommended: 16 credits of literature; 6 credits of writing beyond WR 121

ENG 412. STUDIES IN BRITISH THEATER AND SOCIETY. (4 Credits)
Study of major dramatists and the audiences they addressed, of socio-economic conditions and their interrelations with theatrical institutions. Readings may include dramatic and non-dramatic literature. Historical period and content may vary. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 416. *POWER AND REPRESENTATION. (4 Credits)
Critical analysis of works by colonized peoples, women, and ethnic minorities, with a focus on the issue of representation. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 418. THE ENGLISH NOVEL: VICTORIAN PERIOD. (4 Credits)
Selected English novels focusing on those from the Victorian period. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 420. *STUDIES IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
Comparative studies in literature documenting or illuminating institutional and systematic discrimination. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 425. STUDIES IN MEDIEVAL LITERATURE. (4 Credits)
Particular genres, themes, and writers in medieval literature. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 426. STUDIES IN CHAUCER. (4 Credits)
The works of Geoffrey Chaucer in their historical, cultural, and poetic contexts. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.
ENG 430. STUDIES IN EARLY MODERN LITERATURE. (4 Credits)
Literature and culture of the Tudor, early Stuart, and Interregnum periods, 1485-1660. Content and genres will vary and may include non-English writers who influenced the English Renaissance. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 431. STUDIES IN MODERNISM. (4 Credits)
Studies in the literature and contexts of the Modernist period in Anglo-American letters (1890s to 1940s). Authors may include Wilde, Crane, Conrad, Eliot, Stevens, James, Woolf, Joyce, Lawrence, Shaw, Forster. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 432. STUDIES IN SHAKESPEARE. (4 Credits)
Shakespeare's works from a variety of critical and scholarly perspectives. Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 433. STUDIES IN THE LONG EIGHTEENTH CENTURY. (4 Credits)
Literature of the period 1660-1800, with emphasis on one or more of the following poets: Dryden, Pope, Swift, Johnson, Gray, Cowper. May also include prose writers (e.g., Behn, Fielding, Richardson, Addison and Steele) and dramatists (e.g., Congreve, Wycherly, Gay). Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 434. STUDIES IN ROMANTICISM. (4 Credits)
Romantic-period writing and culture, with emphasis on one or more of the following authors: Blake, Wordsworth, Coleridge, Keats, Byron and Shelley. May also include Romantic novelists and prose writers (e.g., Austen, Wollstonecraft, Burke). Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 435. STUDIES IN SHORT FICTION. (4 Credits)
Particular writers, movements, and types of short fiction. Topics change from term to term. Not offered every year. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 436. STUDIES IN SHAKESPEARE. (4 Credits)
Shakespeare's works from a variety of critical and scholarly perspectives. Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 437. STUDIES IN VICTORIAN LITERATURE. (4 Credits)
Fiction, poetry, and nonfiction prose of the Victorian era. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 438. STUDIES IN MODERNISM. (4 Credits)
Studies in the literature and contexts of the Modernist period in Anglo-American letters (1890s to 1940s). Authors may include Wilde, Crane, Conrad, Eliot, Stevens, James, Woolf, Joyce, Lawrence, Shaw, Forster. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 439. STUDIES IN MODERN IRISH LITERATURE. (4 Credits)
Studies in the literature and contexts of the period of Irish writing often referred to as the Irish Renaissance. Authors may include Yeats, Joyce, Shaw, O'Casey, Gregory, Synge, Bowen, Moore, Behan, O'Brien, Kavanagh, Cronin. Sometimes offered as a study of Joyce's works alone. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 440. STUDIES IN MODERN IRISH LITERATURE. (4 Credits)
Studies in the literature and contexts of the period of Irish writing often referred to as the Irish Renaissance. Authors may include Yeats, Joyce, Shaw, O'Casey, Gregory, Synge, Bowen, Moore, Behan, O'Brien, Kavanagh, Cronin. Sometimes offered as a study of Joyce's works alone. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 441. STUDIES IN NONFICTION. (4 Credits)
Particular essayists and journalists, movements, problems, conventions, and types of nonfiction writing in English. Topics change from term to term. Not offered every year. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 442. STUDIES IN DRAMA. (4 Credits)
Particular dramatists, movements, conventions, and types of world drama. Topics change from term to term. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 443. STUDIES IN MODERNISM. (4 Credits)
Studies in the literature and contexts of the Modernist period in Anglo-American letters (1890s to 1940s). Authors may include Wilde, Crane, Conrad, Eliot, Stevens, James, Woolf, Joyce, Lawrence, Shaw, Forster. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 444. STUDIES IN THE NOVEL. (4 Credits)
Particular novelists, movements, conventions, and types of the novel. Topics change from term to term. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 445. STUDIES IN SHORT FICTION. (4 Credits)
Particular writers, movements, and types of short fiction. Topics change from term to term. Not offered every year. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 446. STUDIES IN DRAMA. (4 Credits)
Particular dramatists, movements, conventions, and types of world drama. Topics change from term to term. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 447. STUDIES IN THE NOVEL. (4 Credits)
Particular novelists, movements, conventions, and types of the novel. Topics change from term to term. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 448. STUDIES IN POETRY. (4 Credits)
Particular poets, movements, problems, conventions, and types of poetry in English or English translation. Topics change from term to term. Not offered every term. (H) (Writing Intensive Course)
The course is repeatable for 8 credits.
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.
ENG 475. STUDIES IN CRITICISM. (4 Credits)
Particular critics, critical movements, issues, and histories of criticism. Topics change from term to term. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 16 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 480. STUDIES IN LITERATURE, CULTURE AND SOCIETY. (4 Credits)
Study of literature in its relationship to society and culture; study of literary culture. Topics change from term to term. Not offered every term. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: FILM 480
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 482. STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT. (4 Credits)
Creative nonfiction, fiction, poetry, and film from the mid-19th century to the present, examining relationships between rural and urban, and investigating the development of important patterns in how the physical environment is perceived, represented, interpreted, and used in the United States. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 485. *STUDIES IN AMERICAN LITERATURE. (4 Credits)
Special topics in American literary history. Organized around movements, regions, themes, or major authors. Topics change from term to term. Not offered every term. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 486. STUDIES IN BRITISH LITERATURE. (4 Credits)
Particular British writers, movements, conventions, genres, and problems. Topics change from term to term. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 488. LITERATURE AND PEDAGOGY. (4 Credits)
Practices, approaches, histories, and theories of teaching literature appropriate for secondary through college settings. Considers text selection, assignments, and evaluation. (H)
Attributes: LACH – Liberal Arts Humanities Core

ENG 489. WRITING, LITERATURE AND MEDICINE. (4 Credits)
Considers medical themes in literature, social meanings of illness, and writing strategies appropriate to the healing arts.

ENG 490. HISTORY OF THE ENGLISH LANGUAGE. (4 Credits)
A study of the origins, changes, and reasons for changes in the grammar, sounds, and vocabulary of English from its earliest stages through its modern forms. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 497. *INTERNATIONAL WOMEN'S VOICES. (4 Credits)
A study of women and literature in an international context, focusing on the cultural differences among women and the effects of gender on language and literature. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 498. WOMEN AND LITERATURE. (4 Credits)
Study of the relations between women and literature, including such issues as images of women in literature, women writers, and the effects of gender on language.
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 499. SELECTED TOPICS. (1-16 Credits)
(h)
Attributes: LACH – Liberal Arts Humanities Core
This course is repeatable for 16 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

ENG 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENG 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENG 507. SEMINAR. (1-16 Credits)
CROSSLISTED as AMS 507/ENG 507.
Equivalent to: AMS 507
This course is repeatable for 16 credits.

ENG 510. GRADUATE INTERNSHIP IN ENGLISH. (1-2 Credits)
Provides graduate students with supervised, on-the-job work experience and professional development. Graded P/N.
This course is repeatable for 12 credits.

ENG 512. STUDIES IN BRITISH THEATER AND SOCIETY. (4 Credits)
Study of major dramatists and the audiences they addressed, of socio-economic conditions and their interrelations with theatrical institutions. Readings may include dramatic and non-dramatic literature. Historical period and content may vary.
This course is repeatable for 8 credits.

ENG 514. INTRODUCTION TO GRADUATE STUDIES. (4 Credits)
Introduction to the MA program; theories and methods of English studies. Offered fall term only. Required for first-year MA students.

ENG 516. POWER AND REPRESENTATION. (4 Credits)
Critical analysis of works by colonized peoples, women, and ethnic minorities, with a focus on the issue of representation. Not offered every year.

ENG 518. THE ENGLISH NOVEL: VICTORIAN PERIOD. (4 Credits)
Selected English novels focusing on those from the Victorian period.

ENG 519. THE ENGLISH NOVEL: 20TH CENTURY. (4 Credits)
Selected English novels of the 20th century.
ENG 520. STUDIES IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
Comparative studies in literature documenting or illuminating institutional and systematic discrimination. Not offered every year.

ENG 525. STUDIES IN MEDIEVAL LITERATURE. (4 Credits)
Particular genres, themes, and writers in medieval literature. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 526. STUDIES IN CHAUCER. (4 Credits)
The works of Geoffrey Chaucer in their historical, cultural, and poetic contexts. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 530. STUDIES IN EARLY MODERN LITERATURE. (4 Credits)
Literature and culture of the Tudor, early Stuart, and Interregnum periods, 1485-1660. Content and genres will vary and may include non-English writers who influenced the English Renaissance.
This course is repeatable for 8 credits.

ENG 533. STUDIES IN THE LONG EIGHTEENTH CENTURY. (4 Credits)
Literature of the period 1660-1800, with emphasis on one or more of the following poets: Dryden, Pope, Swift, Johnson, Gray, Cowper. May also include prose writers (e.g., Behn, Fielding, Richardson, Addison and Steele) and dramatists (e.g., Congreve, Wycherly, Gay). Not offered every term.
This course is repeatable for 8 credits.

ENG 534. STUDIES IN ROMANTICISM. (4 Credits)
Romantic-period writing and culture, with emphasis on one or more of the following authors: Blake, Wordsworth, Coleridge, Keats, Byron and Shelley. May also include Romantic novelists and prose writers (e.g., Austen, Wollstonecraft, Burke). Not offered every term.
This course is repeatable for 8 credits.

ENG 535. STUDIES IN SHAKESPEARE. (4 Credits)
Shakespeare's works from a variety of critical and scholarly perspectives. Not offered every term.
This course is repeatable for 8 credits. Recommended: At least one quarter of Shakespeare

ENG 536. STUDIES IN VICTORIAN LITERATURE. (4 Credits)
Fiction, poetry, and nonfiction prose of the Victorian era. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 538. STUDIES IN MODERNISM. (4 Credits)
Studies in the literature and contexts of the Modernist period in Anglo-American letters (1890's to 1940's). Authors may include Wilde, Crane, Conrad, Eliot, Stevens, James, Woolf, Joyce, Lawrence, Shaw, Forster. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 540. STUDIES IN MODERN IRISH LITERATURE. (4 Credits)
Studies in the literature and context of the period of Irish writing often referred to as the Irish Renaissance. Authors may include Yeats, Joyce, Shaw, O'Casey, Gregory, Synge, Bowen, Moore, Behan, O'Brien, Kavanaugh, Cronin. Sometimes offered as a study of Joyce's works alone. Topics change from term to term.
This course is repeatable for 8 credits.

ENG 545. STUDIES IN NONFICTION. (4 Credits)
Particular essayists and journalists, movements, problems, conventions, and types of nonfiction writing in English. Topics change from term to term.
This course is repeatable for 16 credits.

ENG 550. STUDIES IN SHORT FICTION. (4 Credits)
Particular writers, movements, and types of short fiction. Topics change from term to term. Not offered every year.
This course is repeatable for 8 credits.

ENG 554. MAJOR AUTHORS. (4 Credits)
Advanced study of major and influential authors from various cultures and backgrounds. Subjects change from term to term. Not offered every year.
This course is repeatable for 8 credits.

ENG 560. STUDIES IN DRAMA. (4 Credits)
Particular dramatists, movements, conventions, and types of world drama. Topics change from term to term. Not offered every term.
This course is repeatable for 8 credits.

ENG 565. STUDIES IN THE NOVEL. (4 Credits)
Particular novelists, movements, conventions, and types of the novel throughout its history. Topics change from term to term. Not offered every term.
This course is repeatable for 8 credits.

ENG 570. STUDIES IN POETRY. (4 Credits)
Particular poets, movements, problems, conventions, and types of poetry in English or English translation. Topics change from term to term. Not offered every term.
This course is repeatable for 8 credits.

ENG 575. STUDIES IN CRITICISM. (4 Credits)
Particular critics, critical movements, issues, and histories of criticism. Topics change from term to term. Not offered every year.
This course is repeatable for 16 credits.

ENG 580. STUDIES IN LITERATURE, CULTURE AND SOCIETY. (4 Credits)
Study of literature in its relationship to society and culture; study of literary culture. Topics change from term to term. Not offered every term.
Equivalent to: FILM 580
This course is repeatable for 16 credits.

ENG 582. STUDIES IN AMERICAN LITERATURE, CULTURE, AND THE ENVIRONMENT. (4 Credits)
Creative nonfiction, fiction, poetry, and film from the mid-19th century to the present, examining relationships between rural and urban, and investigating the development of important patterns in how the physical environment is perceived, represented, interpreted, and used in the United States.
This course is repeatable for 8 credits.

ENG 585. STUDIES IN AMERICAN LITERATURE. (4 Credits)
Special topics in American literary history. Organized around movements, regions, themes, or major authors. Topics change from term to term. Not offered every term.
This course is repeatable for 8 credits.

ENG 586. STUDIES IN BRITISH LITERATURE. (4 Credits)
Particular British writers, movements, conventions, genres, and problems. Topics change from term to term. Not offered every year.
This course is repeatable for 8 credits.

ENG 588. LITERATURE AND PEDAGOGY. (4 Credits)
Practices, approaches, histories, and theories of teaching literature appropriate for secondary through college settings. Considers text selection, assignments, and evaluation.

ENG 589. WRITING, LITERATURE AND MEDICINE. (4 Credits)
Considers medical themes in literature, social meanings of illness, and writing strategies appropriate to the healing arts.
ENG 590. HISTORY OF THE ENGLISH LANGUAGE. (4 Credits)
A study of the origins, changes, and reasons for changes in the grammar, sounds, and vocabulary of English from its earliest stages through its modern forms.

ENG 595. LANGUAGE, TECHNOLOGY, AND CULTURE. (4 Credits)
Explores relationship between literacy, technology, and thought.

ENG 598. WOMEN AND LITERATURE. (4 Credits)
Study of the relations between women and literature, including such issues as images of women in literature, women writers, and the effects of gender on language. This course is repeatable for 8 credits.

Entomology (ENT)

ENT 101. INTRODUCTION TO CROP, SOIL, AND INSECT SCIENCE. (1 Credit)
Introduces students with interests in crop, soil, and insect sciences to educational and professional opportunities in these disciplines. Speakers will discuss opportunities in research and academia as well as in the applied professional job market. CROSILISTED as CROP 101/ENT 101/SOIL 101.

Equivalent to: CROP 101, HORT 101, SOIL 101

ENT 300. *PLAGUES, PESTS, AND POLITICS. (3 Credits)
Integration and interaction of agricultural and public health aspects of entomology in society and history. CROSILISTED as ENT 300/HORT 330. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: BI 300, HORT 330

ENT 311. INTRODUCTION TO INSECT PEST MANAGEMENT. (4 Credits)
Identification, biology and management of injurious and beneficial insects. Concurrent laboratory is designed to provide hands-on experience with identification of insect groups of relevance to agricultural cropping systems. Lec/lab.

Equivalent to: CSS 311

Recommended: Entomology course work or one year college biology.

ENT 322. HONEY BEE BIOLOGY AND BEEKEEPING. (3 Credits)
In this introduction to the fascinating honey bee and its biology, honey bees are used as model organisms to illustrate general principles of biology, entomology, and sociobiology. Students will learn the basics of beekeeping, have an opportunity to manipulate honey bee colonies, and gain hands-on experience, prevailing winter weather permitting.

ENT 331. *POLLINATORS IN PERIL. (3 Credits)
Pollinators, human influences on pollination systems, and the potential consequences of pollinator decline. An introduction to the skills needed to investigate media reports and multidisciplinary scientific research. Effects of pesticides, habitat fragmentation, climate change, invasive species, pests, pathogens, and other threats to pollinators in critical natural and agricultural systems around the world. CROSILISTED as ENT 331/HORT 331. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HORT 331
Recommended: Completion of a Baccalaureate Core biological science course.

ENT 401. RESEARCH. (1-16 Credits)
Work on approved problems carried on in the library, laboratory or field. This course is repeatable for 16 credits.

ENT 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 405. READING AND CONFERENCE. (1-16 Credits)
Reading and discussions on special topics. This course is repeatable for 16 credits.

ENT 407. SEMINAR. (1-2 Credits)
Graded P/N. This course is repeatable for 16 credits.

ENT 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENT 420. INSECT ECOLOGY. (3 Credits)
Insect ecology, evolution, and management. Biophysical ecology; foraging and feeding; life cycles; population dynamics, regulation, and control; species interactions including herbivore-plant, predator-prey, parasite-host, competition, and mutualism; diversity, food web structure, agricultural ecology, exercises merge models, experiments, and sampling. Offered on even years.
Recommended: BI 370

ENT 440. ISSUES IN INSECT TOXICOLOGY. (3 Credits)
Introduction to concepts and mechanisms associated with molecular toxicology as it relates to insects, including interactions with naturally occurring and synthetic compounds. Overview of current research in insect toxicology including resistance to pesticides, protection of non-target species, and use of insects as model organisms. Discussion of laboratory and field approaches and potential strategies to address issues in insect toxicology.
Recommended: Background in basic chemistry and biology

ENT 444. INSECT AGROECOLOGY. (3 Credits)
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape. CROSILISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: HORT 444

Recommended: General background or previous course work in entomology.

ENT 499. SPECIAL TOPICS. (1-6 Credits)
Equivalent to: FW 499
This course is repeatable for 6 credits.

ENT 501. RESEARCH. (1-16 Credits)
Work on approved problems carried on in the library, laboratory or field. This course is repeatable for 16 credits.

ENT 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENT 505. READING AND CONFERENCE. (1-16 Credits)
Reading and discussions on special topics. This course is repeatable for 16 credits.

ENT 507. SEMINAR. (1-2 Credits)
Graded P/N. This course is repeatable for 16 credits.

ENT 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
**ENT 509. PRACTICUM IN TEACHING. (1-3 Credits)**
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/ PBG 509/SOIL 509.
Equivalent to: CROP 509, PBG 509, SOIL 509
This course is repeatable for 9 credits.

**ENT 510. INTERNSHIP. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENT 518. CURRENT TOPICS IN ENTOMOLOGY. (2 Credits)**
A core course of the Horticulture graduate program. Provides an advanced understanding of entomology and its relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term.
CROSSLISTED as ENT 518/HORT 518.
Equivalent to: HORT 518
This course is repeatable for 12 credits.

**ENT 520. INSECT ECOLOGY. (3 Credits)**
Insect ecology, evolution, and management. Biophysical ecology; foraging and feeding; life cycles; population dynamics, regulation, and control; species interactions including herbivore-plant, predator-prey, parasite-host, competition, and mutualism; diversity, food web structure, agricultural ecology, exercises merge models, experiments, and sampling. Offered every year.
Recommended: BI 370 and Z 365

**ENT 523. ORGANIC BEEKEEPING AND HONEY PRODUCTION. (3 Credits)**
In this introduction to the fascinating honey bee and its biology, honey bees are used as model organisms to illustrate general principles of biology, entomology, and sociobiology. Learn the basics of beekeeping, organic beekeeping and honey production. Examine the culture and certification of organic and conventional systems of honey production.

**ENT 540. ISSUES IN INSECT TOXICOLOGY. (3 Credits)**
Introduction to concepts and mechanisms associated with molecular toxicology as it relates to insects, including interactions with naturally occurring and synthetic compounds. Overview of current research in insect toxicology including resistance to pesticides, protection of non-target species, and use of insects as model organisms. Discussion of laboratory and field approaches and potential strategies to address issues in insect toxicology.
Recommended: Background in basic chemistry and biology

**ENT 542. PRINCIPLES OF INTEGRATED PEST MANAGEMENT: SYSTEMS DESIGN. (4 Credits)**
Principles of integrated pest management design focusing on the use of systems analysis as a means to integrate management tactics, environmental and biological monitoring, pest control models, and implementation elements into a cohesive whole. Introduction to integrated pest management on websites. Students will design a hypothetical crop-pest management system. Lec/lab.
Equivalent to: HORT 542
Recommended: ENT 311

**ENT 544. INSECT AGROECOLOGY. (3 Credits)**
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape.
CROSSLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: HORT 544
Recommended: General background or previous course work in entomology.

**ENT 548. INTEGRATED PEST MANAGEMENT IN ORGANIC SYSTEMS. (3 Credits)**
Prevention, detection, and management of pests and diseases in organic plant production systems. Content includes activities that require students to expand their experience of pest management in their locality by incorporating new and emergent technology for monitoring, diagnosing and managing insects, pathogen, and weed pests and their impacts on crops. Discussions will be centered on the logistics and potential of new technologies in pest management, incorporating biological, ecological and sustainable agriculture concepts.
Recommended: ENT 311 with minimum grade of D-

**ENT 599. SPECIAL TOPICS. (1-16 Credits)**
Important topics of current interest in the areas of systematics, insect physiology and toxicology, ecology and behavior, and pest management. Course content and title will change with each offering.
This course is repeatable for 16 credits.

**ENT 601. RESEARCH. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENT 603. THESIS. (1-16 Credits)**
This course is repeatable for 999 credits.

**ENT 605. READING AND CONFERENCE. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENT 607. SEMINAR. (1-16 Credits)**
This course is repeatable for 16 credits.

**ENT 609. PRACTICUM IN TEACHING. (1-3 Credits)**
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: CROP 609, PBG 609, SOIL 609
This course is repeatable for 9 credits.

**ENT 699. SPECIAL TOPICS. (1-16 Credits)**
Important topics of current interest in the areas of systematics, insect physiology and toxicology, ecology and behavior, and pest management. Course content and title will change with each offering.
This course is repeatable for 16 credits.
Environmental Arts & Humanities (EAH)

EAH 411. **PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES.** (4 Credits)
Introduction to methods of inquiry in the field of environmental arts and humanities. Students will learn key concepts in approaches to environmental humanities scholarship and environmental art, informed by ecological principles and other perspectives from the natural sciences. Disciplinary approaches include history, literature, philosophy, and the formal arts. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC

EAH 412. **ENVIRONMENTAL SCIENCE IN CONTEXT.** (4 Credits)
Introduction to environmental science methods and practice, especially for students studying in the arts and humanities. Students will gain a working understanding of the scientific method, theory, and analysis, including how to interpret and evaluate risk assessment, statistics-based arguments, and visual representations of data. Students will also gain an understanding of the history and role of the sciences in environmental discourse. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC

EAH 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

EAH 503. THESIS. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

EAH 505. READING AND CONFERENCE. (1-4 Credits)
Graded P/N.
This course is repeatable for 4 credits.

EAH 506. FIELD COURSE PROJECTS. (3 Credits)

EAH 507. SEMINAR. (2-4 Credits)
This course is repeatable for 10 credits.

EAH 508. PROFESSIONAL DEVELOPMENT WORKSHOP. (1 Credit)
Graded P/N.
This course is repeatable for 6 credits.

EAH 510. WORK AND FIELD EXPERIENCE. (1-4 Credits)
Graded P/N.
This course is repeatable for 8 credits.

EAH 511. PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES. (4 Credits)
Introduction to methods of inquiry in the field of environmental arts and humanities. Students will learn key concepts in approaches to environmental humanities scholarship and environmental art, informed by ecological principles and other perspectives from the natural sciences. Disciplinary approaches include history, literature, philosophy, and the formal arts.

EAH 512. ENVIRONMENTAL SCIENCE IN CONTEXT. (4 Credits)
Introduction to environmental science methods and practice, especially for students studying in the arts and humanities. Students will gain a working understanding of the scientific method, theory, and analysis, including how to interpret and evaluate risk assessment, statistics-based arguments, and visual representations of data. Students will also gain an understanding of the history and role of the sciences in environmental discourse.

Environmental Engineering (ENVE)

ENVE 199. SPECIAL TOPICS. (1-16 Credits)
Seminar course that includes invited speakers. Open to all students interested in learning about the Environmental Engineering undergraduate program and potential career opportunities. Graded P/N.
This course is repeatable for 16 credits.

ENVE 299. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: ENVE 299H
This course is repeatable for 16 credits.

ENVE 299H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 299
This course is repeatable for 16 credits.

ENVE 321. ENVIRONMENTAL ENGINEERING FUNDAMENTALS. (4 Credits)
Application of engineering principles to the analysis of environmental problems. Topics include water, wastewater, solid wastes, and air pollution.
Prerequisites: MTH 256 with C or better or MTH 256H with C or better

ENVE 322. FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING. (4 Credits)
Application of engineering principles to the analysis of environmental problems. Topics include water, wastewater, solid wastes, and air pollution.
Prerequisites: (((CH 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 225H with C or better) and (MTH 256 [C] or MTH 256H [C]))

ENVE 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 406. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 407. SEMINAR. (1-16 Credits)
Equivalent to: ENVE 407H
This course is repeatable for 16 credits.

ENVE 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 407
This course is repeatable for 16 credits.

ENVE 410. OCCUPATIONAL INTERNSHIP. (1-12 Credits)
This course is repeatable for 12 credits.

ENVE 415. ENVIRONMENTAL ENGINEERING LABORATORY. (3 Credits)
Theoretical and empirical analysis of several unit operations, use of formal work processes, safety, teamwork, oral and written communication, and personal accountability. Lec/lab/rec.
Prerequisites: CBEE 414 with C or better
Equivalent to: CHE 415
ENVE 421. DRINKING WATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of drinking water sources including engineering principles for the selection and design of treatment processes. Lec/rec/lab.
Prerequisites: ENVE 322 with C or better

ENVE 422. WASTEWATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of municipal and industrial wastewaters including engineering principles for the selection and design of treatment processes. Lec/rec.
Prerequisites: ENVE 421 with C or better

ENVE 425. AIR POLLUTION CONTROL. (3 Credits)
Study of air pollution sources, transport, and control, including engineering, chemical, meteorological, social, and economic aspects. Lec/rec.
Prerequisites: ENVE 321 with C or better or ENVE 322 with C or better

ENVE 431. FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS. (4 Credits)
Fundamentals of organic chemistry and engineering principles applied to the movement and fate of xenobiotic compounds. Lec/lab/rec.
Prerequisites: ((CH 123 with C or better or CH 223 with C or better or CH 226H with C or better or CH 226H with C or better) and (CH 440 [C] or CHE 331 [C] or ENVE 321 [C] or ENVE 322 [C]) and ENVE 421 [C])

ENVE 456. SUSTAINABLE WATER RESOURCES DEVELOPMENT. (3 Credits)
Sustainable water resources engineering principles, assessing the impact of engineering practices. Use of engineering analyses and sustainable principles to design projects and minimize their environmental impact.

ENVE 457. BIOREACTORS. (3 Credits)
Design and analysis of bioreactors using suspension and immobilized microbial cultures.
Prerequisites: CHE 333 with C or better and ENVE 322 [C]

ENVE 490. ENVIRONMENTAL ENGINEERING DESIGN. (4 Credits)
Open-ended design of environmental processes including development of process flow diagrams, control strategies, process simulators, and financial analysis of processes. Lec/rec.
Prerequisites: ENVE 421 with C or better and ENVE 422 [C]

ENVE 499. SPECIAL TOPICS IN ENVIRONMENTAL ENGINEERING. (1-4 Credits)
A critical examination of topics selected by the instructor from among topics not covered in other environmental engineering courses. This course is repeatable for 4 credits.

ENVE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENVE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 507. SEMINAR. (1-16 Credits)
One-credit seminar. Graded P/N.
This course is repeatable for 16 credits.

ENVE 510. INTERNSHIPS. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 521. DRINKING WATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of drinking water sources including engineering principles for the selection and design of treatment processes. Lec/rec/lab.
Recommended: ENVE 322

ENVE 522. WASTEWATER TREATMENT PROCESSES. (4 Credits)
Characterization and treatment of municipal and industrial wastewaters including engineering principles for the selection and design of treatment processes. Lec/rec.
Recommended: ENVE 421

ENVE 525. AIR POLLUTION CONTROL. (3 Credits)
Study of air pollution sources, transport, and control, including engineering, chemical, meteorological, social, and economic aspects. Lec/rec.
Recommended: ENVE 321 or ENVE 322

ENVE 531. FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS. (4 Credits)
Fundamentals of organic chemistry and engineering principles applied to the movement and fate of xenobiotic compounds. Lec/lab/rec.
Recommended: (CH 123 or CH 223 or CH 226H or CH 223H) and (CH 440 or CHE 331 or CHE 331H) and (ENVE 321 or ENVE 322) and ENVE 421

ENVE 532. AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS. (4 Credits)
Low temperature thermodynamic and selective kinetic treatments primarily of the inorganic chemistry groups, but also organic ligands and surface active groups, of natural and engineered waters; thermodynamic principles and computational techniques for prediction of equilibrium speciation; comparison of predictions to observations; computer laboratory. Lec/rec.
Equivalent to: OC 532
Recommended: One year of college-level chemistry (CH 221 and CH 222 and CH 223) or ((CH 231 or CH 231H) and (CH 232 or CH 232H) and (CH 233 or CH 233H)); a minimum of one year organic or physical chemistry; and concurrent enrollment in ENVE 536 and/or OC 652

ENVE 535. PHYSICAL AND CHEMICAL TREATMENT PROCESSES. (4 Credits)
Fundamental principles of physical and chemical processes relevant for the treatment of contaminants in environmental matrices (e.g. water, air and soil).
Prerequisites: ENVE 532 with C or better
Equivalent to: ENVE 538

ENVE 536. AQUEOUS ENVIRONMENTAL CHEMISTRY LABORATORY. (1 Credit)
Laboratory investigation of acid/base equilibria, coordination chemistry, and precipitation/dissolution chemistry.
Corequisites: ENVE 532

ENVE 541. MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS. (4 Credits)
Energetics kinetics and stoichiometry of microbial transformations of organic and inorganic compounds. Mathematical models of biodegradation.

ENVE 542. MICROBIAL PROCESS DESIGN FOR MUNICIPAL AND HAZARDOUS WASTES. (4 Credits)
Principles and design of microbial processes for treatment of municipal and hazardous wastes.
Prerequisites: ENVE 541 with C or better
ENVE 545. MICROBIAL METHODS IN ENVIRONMENTAL ENGINEERING. (3 Credits)
Covers the principles of microbiological methods pertinent to environmental engineers with an emphasis on applications in drinking water treatment, wastewater treatment, and soil remediation. The course is targeted at engineering students who do not have much experience with culture-based and molecular-based techniques.
Prerequisites: ENVE 541 with C+ or better

ENVE 554. GROUNDWATER REMEDIATION. (4 Credits)

ENVE 556. SUSTAINABLE WATER RESOURCES DEVELOPMENT. (3 Credits)
Sustainable water resources engineering principles, assessing the impact of engineering practices. Use of engineering analyses and sustainable principles to design projects and minimize their environmental impact.

ENVE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

ENVE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENVE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENVE 699. SELECTED TOPICS IN ENVIRONMENTAL ENGINEERING. (1-4 Credits)
A critical examination of topics selected by the instructors from among topics not covered in other environmental engineering courses.
Equivalent to: ENVE 611
This course is repeatable for 8 credits.

Environmental Sciences (ENSC)

ENSC 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

ENSC 004. INTERNSHIP (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students' understanding of the connection between theory and practice in their respective disciplines.

ENSC 101. ENVIRONMENTAL SCIENCES ORIENTATION. (1 Credit)
Introduction to the Environmental Sciences Program and related professional and educational opportunities. Recommended for all freshman and first-year transfer environmental sciences majors, but open to all students interested in learning about career options in the environmental sciences. Graded P/N.

ENSC 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ENSC 399H
This course is repeatable for 16 credits.

ENSC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 402. INDEPENDENT STUDIES. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 403. THESIS. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 405. READING AND CONFERENCE. (1-12 Credits)
Equivalent to: ENSC 405H
This course is repeatable for 16 credits.

ENSC 406. PROJECTS. (1-16 Credits)
This course is repeatable for 24 credits.

ENSC 407. SEMINAR. (1-16 Credits)
Equivalent to: ENSC 407H
This course is repeatable for 12 credits.

ENSC 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ENSC 407
This course is repeatable for 12 credits.

ENSC 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 12 credits.

ENSC 410. ENVIRONMENTAL SCIENCE INTERNSHIP. (1-12 Credits)
Supervised practical experience working with professionals at selected cooperating institutions, agencies, laboratories, or companies. Graded P/N.
This course is repeatable for 48 credits.

ENSC 452. ENVIRONMENTAL ASSESSMENT. (3 Credits)
Environmental site assessment is a primary tool for environmental science professionals. Apply environmental science concepts to evaluate features of a specific natural area and conduct a land suitability analysis. Create a conceptual site design and management plan that complies with federal, state, and local regulations and environmental laws.
Equivalent to: GEOG 452

ENSC 479. **ENVIRONMENTAL CASE STUDIES. (3 Credits)
Improves students' ability to ask questions, gather and synthesize information, and communicate ideas on environmental topics. Instruction and information necessary for the course is entirely Web based. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC
Equivalent to: BOT 479
Recommended: One year of college biology or chemistry

ENSC 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 503. THESIS. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 999 credits.

ENSC 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 508. WORKSHOP. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 16 credits.
ENSC 510. INTERNSHIP. (1-12 Credits)
This course is repeatable for 12 credits.

ENSC 515. ENVIRONMENTAL PERSPECTIVES AND METHODS. (3 Credits)
Unique perspective or method each quarter. Possibilities include: remote sensing, modeling over a range of scales in time, space, and levels of system organization; and risk analysis.

ENSC 516. USING BEST PRACTICES IN ENVIRONMENTAL PROJECT MANAGEMENT. (4 Credits)
Explore foundational project management concepts using a real world case-study to practice both soft and hard skills through individual and group assignments, discussions and presentations. Apply best practices, methodologies and tools using a global standards framework to achieve successful outcomes in environmental project management work. Active learning and networking are incorporated throughout the course to provide a full perspective on project management.

ENSC 520. ENVIRONMENTAL ANALYSIS. (3 Credits)
Develop analytical thinking, explore analytical approaches, enhance writing skills, and gain experience in oral communication about environmental issues.

ENSC 540. ENVIRONMENTAL SCIENCE PERSPECTIVES ON THE FUTURE OF FOOD. (4 Credits)
Examines the newest developments in environmental science research and on-the-ground best management practices for achieving food security and sustainability for growing U.S. and global populations in a dynamic environment and climate.

ENSC 541. ENVIRONMENTAL SCIENCE, SCIENTISTS, AND SOUND DECISIONS. (4 Credits)
Focusing on analyzing the role of environmental science and scientists in decision-making in a variety of professional contexts at various scales (local through global) using a case-study approach and proposing a draft model process.

ENSC 542. MANAGEMENT OPPORTUNITIES IN THE NITROGEN CASCADE. (4 Credits)
Analyzes the environmental science behind reducing excess reactive nitrogen entering the environment through our provision of food, power, and transportation for future populations. Identifies emerging complementary suites of interventions and legislation innovating management practices at local, regional, national and international scales.

ENSC 543. EXCELING IN AN INTERDISCIPLINARY TEAM. (4 Credits)
Identifying, examining and practicing the top skills, attributes and leadership dynamics involved in working in interdisciplinary environmental science teams in industry, government, and research organizations, informed by experienced experts across these areas.

ENSC 555X. FOOD FOR CHANGE. (3 Credits)
Focusing on traditional regional recipes, explore and document how global change has affected food production and demand until today and how projected climate change will affect it in the future by analyzing the ingredient lists. Focus on one recipe/ingredient, find maps of past/current crop ranges, document changes, and identify possible replacement ingredients projecting future culinary solutions.
Recommended: GEGG 472

ENSC 599. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ENSC 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ENSC 699. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Ethnic Studies (ES)

ES 101. *INTRODUCTION TO ETHNIC STUDIES. (3 Credits)
This interdisciplinary course focuses on the ethnic group experience in the United States with emphasis on African Americans, Native Americans, Chicanas/os, Latinas/os, and Asian Americans. (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; LACS – Liberal Arts Social Core

ES 159. *LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed notions. CROSSLISTED as ANTH 159/ES 159/WLC 159. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ANTH 159, WLC 159

ES 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 201. *INVENTING ETHNIC AMERICA. (3 Credits)
An examination of past and present constructions of race and ethnicity in U.S. culture and society and their impact on individuals, institutions, policies, and practices, with particular emphasis on contemporary America. (Bacc Core Course) (H) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core

ES 211. *INTRODUCTION TO LATINO/A STUDIES. (4 Credits)
An introduction to key concepts and ideas in Latino/a Studies, with a focus on the processes that led to the historical incorporation of various Latin@ groups into the United States, and the factors that have shaped contexts of reception for Latino/as historically. Students will explore connections and disconnections between historical and present day discourses and processes. (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity

ES 213. *LATINO/A IDENTITIES AND ACTIVISM. (4 Credits)
A comparative interdisciplinary treatment of contemporary Latino/a cultures and current issues affecting their status in the United States. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

ES 221. *SURVEY OF AFRICAN AMERICAN STUDIES I. (4 Credits)
An interdisciplinary survey of the African American experience beginning with pre-colonial Africa to the early 1900s. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western
Equivalent to: ES 221H
ES 221H. *SURVEY OF AFRICAN AMERICAN STUDIES I. (3 Credits)
An interdisciplinary survey of the African American experience beginning with pre-colonial Africa and ending with World War I. (H) (NC) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 221

ES 223. *SURVEY OF AFRICAN AMERICAN STUDIES II. (4 Credits)
An interdisciplinary survey of the African American experience from World War I to the present. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: ES 223H

ES 223H. *SURVEY OF AFRICAN AMERICAN STUDIES II. (4 Credits)
An interdisciplinary survey of the African American experience from World War I to the present. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: ES 223

ES 231. *INTRODUCTION TO ASIAN AMERICAN STUDIES. (4 Credits)
An examination of the histories and experiences of Asian Americans from the mid-1800s to the present through historical texts, oral histories, personal essays, video, audio, and creative writings. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core

ES 233. *ASIAN PACIFIC AMERICAN ACTIVISM AND EMPOWERMENT. (4 Credits)
A look at Asian Pacific American activism and issues, from early labor organizing to contemporary community efforts, with particular emphasis on the 1960s to the present. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core

ES 241. *INTRODUCTION TO NATIVE AMERICAN STUDIES. (4 Credits)
A survey of Native American cultures and history, both prior to and following contact with Europeans. Introduces the key contemporary issues and questions in the field of Native American studies. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 241H

ES 241H. *INTRODUCTION TO NATIVE AMERICAN STUDIES. (4 Credits)
A survey of Native American cultures and history, both prior to and following contact with Europeans. Introduces the key contemporary issues and questions in the field of Native American studies. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 241

ES 243. *NATIVE AMERICAN ASSIMILATION AND ACTIVISM. (4 Credits)
Comprehensive course dealing with Native American experiences in the United States. Focuses on tribal and individual Native American activism and responses to government policies and cultural practices of assimilation since 1900. (Bacc Core Course) (H) (NC)
Attributes: CPCD – Core, Pers, Cult Diversity; CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ES 260. *INTRODUCTION TO PACIFIC ISLANDS STUDIES. (4 Credits)
Introduction to the geography, societies, histories, cultures, and contemporary issues of Oceania (Pacific islands). Especially concerned with the experience of indigenous communities and the representations generated inside and outside Oceania. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

ES 270. MAKING ALLIANCES AND SOLIDARITIES. (4 Credits)
Examines the history of social justice movement alliances and solidarity work. Students will learn from case studies and analyses of successes and failures in collaborations across race, gender, class, sexuality, and indigenous communities. Students will extend course learning via experiential projects requiring the application and practice of alliance-making and solidarity principles.

ES 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 311. NARRATIVES OF LATINO MIGRATIONS. (3 Credits)
A study of the scholarship and creative literature dealing with migrations from Mexico and other Latin American countries to the United States.
Attributes: LACH – Liberal Arts Humanities Core

ES 321. AFRICAN AMERICAN POLITICAL AND SOCIAL THOUGHT: 20TH CENTURY. (4 Credits)
This interdisciplinary course examines the dialogues, conflicts and self-representations produced by African Americans beginning with the closing years of the 19th century (1895) and ending with the opening days of World War II. (SS)
Attributes: LACH – Liberal Arts Humanities Core

ES 323. CONTEMPORARY AFRICAN AMERICAN SOCIAL DISCOURSE. (4 Credits)
Interdisciplinary course examines key African American political discourse(s) that emerged in response to major social and cultural transformations occurring in the United States after World War II to the present. (SS)
Attributes: LACN – Liberal Arts Non-Western Core

ES 332. ASIAN PACIFIC AMERICANS AND THE MEDIA. (4 Credits)
A broad study of representations of Asians, Pacific Islanders, and Asian Pacific Americans in various US media, including media produced by Asian Pacific Americans themselves.
Attributes: LACH – Liberal Arts Humanities Core

ES 334. *ASIAN PACIFIC AMERICAN LITERATURE. (4 Credits)
An examination of various works by Asian Pacific American writers and some of the critical debates surrounding them. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPLA – Core, Pers, Lit and Arts

ES 345. NATIVE AMERICANS IN OREGON. (4 Credits)
Analysis and understanding of the complex experiences of Native Americans in the present state of Oregon, from early contact with those of other ethnicities to contemporary demographic contexts. (H) (NC)
Attributes: LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

ES 350. *PUBLIC DISCOURSE AND WRITINGS ON RACE. (4 Credits)
Explores historical and contemporary cases of private, political, and public discourse on race and difference. Students will study diverse examples to explore strategies and methods of dominant and resistant discourse, as well as their social and material impacts. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
ES 351. *ETHNIC MINORITIES IN OREGON. (4 Credits)
Exploration of the cultures and contributions of major ethnic groups in the state of Oregon. With timelines, oral histories, and audiovisual aids, the course will allow students to learn the ethnic and regional diversity in Oregon history. (Bacc Core Course) (H)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

ES 353. *ENVIRONMENTAL RACISM. (4 Credits)
Introduces environmental racism; the unequal impact of environmental harm on communities of color and indigenous peoples. Presents empirical evidence and theoretical frames, and explores efforts by government, residents, and activists to combat it. Considers questions of environmental justice via social structure, public access, open space, indigeneity, food, and media. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 353

ES 353H. *ENVIRONMENTAL RACISM. (4 Credits)
Introduces environmental racism; the unequal impact of environmental harm on communities of color and indigenous peoples. Presents empirical evidence and theoretical frames, and explores efforts by government, residents, and activists to combat it. Considers questions of environmental justice via social structure, public access, open space, indigeneity, food, and media. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 353

ES 354. *LITERATURE OF ETHNIC MINORITIES IN THE UNITED STATES. (4 Credits)
An examination of various literary works by ethnic minorities addressing issues of race and ethnicity in U.S. culture and society. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

ES 355. *RACE, SPACE, AND DIFFERENCE. (4 Credits)
A hands-on approach to exploring how we make space, and why geography is always infused with markers of social identity and exercises of power. Will practice 'reading' space and landscapes, and learn how notions of race and other forms of 'difference' shape space (and vice versa) to produce experiences of inclusion, exclusion, cooperation, and conflict. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 355

ES 355H. *RACE, SPACE, AND DIFFERENCE. (4 Credits)
A hands-on approach to exploring how we make space, and why geography is always infused with markers of social identity and exercises of power. Will practice 'reading' space and landscapes, and learn how notions of race and other forms of 'difference' shape space (and vice versa) to produce experiences of inclusion, exclusion, cooperation, and conflict. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 355

ES 357. *FARMWORKER JUSTICE MOVEMENTS. (4 Credits)
Justice movements for farmworkers have a long and storied past in the annals of US history. This course begins with the 1960s Chicano civil rights era struggles for social justice. Focus on the varied strategies of four farmworker justice movements: United Farm Workers, Farm Labor Organizing Committee, Pineros y Campesinos Unidos Noroeste, and the Coalition of Immokalee Workers. The course is structured around the question of the movement and its various articulations. Course covers central themes and strategies that comprise the core of farmworker movements but is designed to allow students to explore other articulations they find relevant. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 357

ES 357H. *FARMWORKER JUSTICE MOVEMENTS. (4 Credits)
Justice movements for farmworkers have a long and storied past in the annals of US history. This course begins with the 1960s Chicano civil rights era struggles for social justice. Focus on the varied strategies of four farmworker justice movements: United Farm Workers, Farm Labor Organizing Committee, Pineros y Campesinos Unidos Noroeste, and the Coalition of Immokalee Workers. The course is structured around the question of the movement and its various articulations. Course covers central themes and strategies that comprise the core of farmworker movements but is designed to allow students to explore other articulations they find relevant. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: ES 357

ES 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSLISTED as ES 361/ QS 361/WGSS 361/WLC 361.
Equivalent to: QS 361, WGSS 361, WLC 361
Recommended: Prior filmmaking experience

ES 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ANTH 373, WGSS 373, WLC 373

ES 375. *ARTS AND SOCIAL JUSTICE. (4 Credits)
Explores concepts of structural inequality, difference, power, and discrimination through a critical survey of arts activism. Think critically about artwork and artists who address a number of social issues in the United States, including race, ethnicity, class, gender, sexuality, immigration, and indigeneity. CROSSLISTED as ES 375/QS 375/ WGSS 375.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 375, WGSS 375
ES 377. *HEALTH AND SOCIAL JUSTICE. (4 Credits)
Introduction to the intersection of health and social justice, to better understand socially unjust health differences (inequities) present in communities across the United States and abroad. Examination of relevant historical issues, theories of justice, human rights, and empirical evidence of health inequities, with an emphasis in critical analysis and applied knowledge. Overview of community-engaged participatory approaches that may be used to address social injustices and health inequities. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

ES 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ES 399H
This course is repeatable for 16 credits.

ES 399H. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: ES 399
This course is repeatable for 16 credits.

ES 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ES 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ES 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ES 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ES 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

ES 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ES 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 416. MIGRANT HEALTH. (4 Credits)
An overview of major health and health care issues related to immigrant communities in the United States. From an ecological perspective, students gain an understanding of the theories and realities about migration and the migration-health relationship. In particular, the situation of migrant and seasonal farmworkers in the Pacific Northwest is analyzed. Specific topics include assimilation and acculturation, access to care, protective practices (the so-called Latino paradox), migrant health centers and community health workers, environmental and occupational issues, immigrant families.

ES 431. *QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 431, WGSS 431

ES 437. *(EN)GENDERING ASIAN PACIFIC AMERICA. (4 Credits)
An examination of intersecting articulations of race, class, gender, sexuality, and ethnicity as they relate to and are addressed by Asian Pacific Americans. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Non-Western Core
Equivalent to: ES 431

ES 444. NATIVE AMERICAN LAW. TRIBES, TREATIES, AND THE UNITED STATES. (4 Credits)
Examination of the parameters of native treaty relationships with the federal and state governments, and considers the future of these agreements.
Attributes: LACN – Liberal Arts Non-Western Core; LACS – Liberal Arts Social Core

ES 445. *NATIVE AMERICAN SCIENCE AND TECHNOLOGY. (4 Credits)
Examination of scientific and technological discovery, continuity, and change among indigenous peoples, with particular emphasis on selected communities of pre- and post-European contact North America. (Bacc Core Course) (H) (NC)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 445H

ES 445H. *NATIVE AMERICAN SCIENCE AND TECHNOLOGY. (4 Credits)
Examination of scientific and technological discovery, continuity, and change among indigenous peoples, with particular emphasis on selected communities of pre- and post-European contact North America. (Bacc Core Course) (H) (NC)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: ES 445

ES 448. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 448, REL 448

ES 451. THEORIES OF RACE AND ETHNICITY. (4 Credits)
A seminar examining various theories of race and ethnicity, their historical contexts, and applications.

ES 452. *ETHNICITY IN FILM. (4 Credits)
Using ethnicity and gender as primary frames of reference, this upper-division/graduate level seminar seeks to introduce students to critical film theory and examine ethnicity and gender as a force both in front of and behind the camera. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACN – Liberal Arts Non-Western Core

ES 453. *ETHNOHISTORY METHODOLOGY. (4 Credits)
A seminar developing techniques for collecting, analyzing, and incorporating ethnic community histories in research papers and theses. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
ES 455. INTERNSHIP SEMINAR. (1 Credit)
Prepares students for the internship and provides an opportunity to explore career options and/or graduate study.
Recommended: ES 101 and ES 201

ES 457. LITERATURE BY WOMEN OF COLOR IN THE UNITED STATES. (4 Credits)
An examination of works by various women writers of color and their treatment of issues such as race, ethnicity, class, sexuality, and gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

ES 458. RACIAL PATTERNS OF URBANIZATION. (4 Credits)
This interdisciplinary course will examine the linkages between race and patterns of urbanization. It will examine how ideologies about race, gender, and class have set the themes of debate and discussion about urbanization in both theoretical and popular discourses.

ES 459. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas– as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ANTH 459, WLC 459

ES 460. ETHNICITY AND SOCIAL JUSTICE. (4 Credits)
Seminar examines inequities and social justice issues in contemporary U.S. society, particularly dimensions of race and ethnicity in our public policies and practices impacting communities in areas such as housing, poverty, employment, public health, education, law enforcement, and the environment.

ES 461. RACISM AND THE PRISON INDUSTRIAL COMPLEX. (4 Credits)
The prison industrial/punishment complex in the late 20th and early 21st centuries has become a growth industry with the privatization of prisons, and mass incarceration of mostly people-of-color. This course examines the history and growth of this industry and the implications that it has on this democracy.

ES 463. US EMPIRE/IMPERIALISM, SETTLER/COLONIALISM, CAPITALISM/RACE. (4 Credits)
How and when did the United States become an empire? This course approaches the historical and contemporary actions of the United States as both a continental and global empire through historiography, socio-political, economic, and racial analyses of U.S. hegemony. Students will learn from recent interdisciplinary scholars who have worked to understand the development of U.S. empire as a series of overlapping cultural projects in the homeland, and beyond the borders of the United States as mutually constitutive of political, and economic, and cultural processes of empire-building, that is capital accumulation, and power.

ES 464. FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: FCSJ 464

ES 472. INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ENG 472, WS 472
Recommended: WS 262 or ES 242 or WS 414

ES 477. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/WS 477/WGSS 477 and ES 577/WS 577/WGSS 577.
Equivalent to: WS 477, WGSS 477
Recommended: WS 262 and WS 462

ES 483. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 483, PS 483, WLC 483

ES 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better and (ANTH 410 [D+] or ES 410 [D+] or WGSS 410 [D+] or WLC 410 [D+])
Equivalent to: ANTH 485, WGSS 485, WLC 485
This course is repeatable for 4 credits.

ES 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
ES 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

ES 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ES 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ES 506. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ES 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

ES 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

ES 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student's research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSLISTED as ANTH 515/ CSSA 515/ES 515/WGSS 515.

Equivalent to: ANTH 515, CSSA 515, WGSS 515

ES 516. MIGRANT HEALTH. (4 Credits)
An overview of major health and health care issues related to immigrant communities in the United States. From an ecological perspective, students gain an understanding of the theories and realities about migration and the migration-health relationship. In particular, the situation of migrant and seasonal farmworkers in the Pacific Northwest is analyzed. Specific topics include assimilation and acculturation, access to care, protective practices (the so-called Latino paradox), migrant health centers and community health workers, environmental and occupational issues, immigrant families.

ES 531. QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531.

Equivalent to: QS 531, WGSS 531

ES 537. (EN)GENDERING ASIAN PACIFIC AMERICA. (4 Credits)
An examination of intersecting articulations of race, class, gender, sexuality, and ethnicity as they relate to and are addressed by Asian Pacific Americans.

Equivalent to: ES 531

ES 544. NATIVE AMERICAN LAW: TRIBES, TREATIES, AND THE U.S.. (4 Credits)
Examination of the parameters of native treaty relationships with the federal and state governments, and considers the future of these agreements.

ES 548. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548.

Equivalent to: PHL 548, REL 548

ES 551. THEORIES OF RACE AND ETHNICITY. (4 Credits)
A seminar examining various theories of race and ethnicity, their historical contexts, and applications.

ES 552. ETHNICITY IN FILM. (4 Credits)
Using ethnicity and gender as primary frames of reference, this upper-division/graduate level seminar seeks to introduce students to critical film theory and examine ethnicity and gender as a force both in front of and behind the camera.

ES 553. ETHNOHISTORY METHODOLOGY. (4 Credits)
A seminar developing techniques for collecting, analyzing, and incorporating ethnic community histories in research papers and theses.

ES 557. LITERATURE BY WOMEN OF COLOR IN THE UNITED STATES. (4 Credits)
An examination of works by various women writers of color and their treatment of issues such as race, ethnicity, class, sexuality, and gender.

ES 558. RACIAL PATTERNS OF URBANIZATION. (4 Credits)
This interdisciplinary course will examine the linkages between race and patterns of urbanization. It will examine how ideologies about race, gender, and class have set the themes of debate and discussion and about urbanization in both theoretical and popular discourses.

ES 559. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas— as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.

Equivalent to: ANTH 559, WLC 559

ES 560. ETHNICITY AND SOCIAL JUSTICE. (4 Credits)
Seminar examines inequities and social justice issues in contemporary U.S. society, particularly dimensions of race and ethnicity in our public policies and practices impacting communities in areas such as housing, poverty, employment, public health, education, law enforcement, and the environment.

ES 561. RACISM AND THE PRISON INDUSTRIAL COMPLEX. (4 Credits)
The prison industrial/punishment complex in the late 20th and early 21st centuries has become a growth industry with the privatization of prisons, and mass incarceration of mostly people-of-color. This course examines the history and growth of this industry and the implications that it has on this democracy.
ES 563. US EMPIRE/IMPERIALISM, SETTLER/OLONIALISM, CAPITALISM/RACE. (4 Credits)
How and when did the United States become an empire? This course approaches the historical and contemporary actions of the United States as both a continental and global empire through historiography, socio-political, economic, and racial analyses of U.S. hegemony. Students will learn from recent interdisciplinary scholars who have worked to understand the development of U.S. empire as a series of overlapping cultural projects in the homeland, and beyond the borders of the United States as mutually constitutive of political, and economic, and cultural processes of empire-building, that is capital accumulation, and power.

ES 564. FOOD AND ETHNIC IDENTITY: DECOLONIZING OUR FOOD AND BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564.
Equivalent to: FCSJ 564

ES 569. TOPICS IN JOTERIA STUDIES. (3 Credits)
A space for engaging with arts, activism and scholarship emerging from queer Latin@/Chicano@ experiences and consciousness is provided. Offered winter term in odd years. CROSSLISTED as ES 569/QS 569/SPAN 569/WGSS 569.
Equivalent to: QS 569, SPAN 569, WGSS 569
This course is repeatable for 6 credits.

ES 572. INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
'Two-spirit' refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/WGSS 572.
Equivalent to: QS 572, WGSS 572
Recommended: QS 262 or ES 242 or WGSS 414 or WGSS 514

ES 575. CRITICAL RACE FEMINISM AND OUTSIDER JURISPRUDENCE. (4 Credits)
Critical exploration of critical legal justice movements and their relationship to social identities. Seminar emphasizes specific legal cases, federal and state laws, and constitutional issues that impact groups deemed outsiders in legal discourse as well as their social implications. The critical justice movement and anti-subordination struggles will be explored via case analyses that shape race, class, gender, sexuality, and disability relations. Theoretical contributions of law and society, critical race theory, LatCrit, and critical race feminism, critical white studies, critical mixed race studies, OutCrit, ClassCrit, and critical disability studies applied to historical precedent and current attempts at marginalizing/empowering communities. CROSSLISTED as ES 575/ WGSS 575.
Equivalent to: WGSS 575

ES 577. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/ WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: QS 577, WGSS 577
Recommended: QS 262 and QS 464

ES 583. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 583, PS 583, WLC 583

ES 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

ES 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

Film Studies (FILM)

FILM 110. *INTRODUCTION TO FILM STUDIES: 1895-1945. (3 Credits)
An introduction to the serious study of world cinema, 1895-1945. Class lectures will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films from the U.S., Europe, and Asia accompany the lectures. Film fee required. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 110

FILM 125. *INTRODUCTION TO FILM STUDIES: 1945-PRESENT. (3 Credits)
Provides an introduction to the serious study of world cinema, 1945-present. Class lectures will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films from the U.S., Europe, and Asia accompany the lectures. Film fee required. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 125

FILM 220. *TOPICS IN DIFFERENCE, POWER, AND DISCRIMINATION. (4 Credits)
A comparative treatment of literary topics in the context of institutional and systematic discrimination. Not offered every year. CROSSLISTED as ENG 220/FILM 220. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 220, ENG 220H
FILM 245. *THE NEW AMERICAN CINEMA. (4 Credits)
A formalist, ideological, and commercial investigation into contemporary American cinema. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 245, FILM 245H

FILM 245H. *THE NEW AMERICAN CINEMA. (4 Credits)
A formalist, ideological, and commercial investigation into contemporary American cinema. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

FILM 255. *WORLD CINEMA PART I: ORIGINS TO 1968. (4 Credits)
A systematic introduction to the arts and history of international cinema, from the invention of the medium in 1895 to the rise of New Wave and Third Cinema in the 1960s. Weekly screenings of films such as Rashomon, Tokyo Story, Pather Parchali, Terra em Transe, and La Noire de. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

FILM 256. *WORLD CINEMA PART II: 1968-PRESENT. (4 Credits)
A systematic introduction to the arts and history of international cinema, from the decolonization movement in the 1960s and the 1970s to the dynamics of globalization that we are experiencing today. Weekly screenings include such films as A Better Tomorrow, Chungking Express, Spirited Away, Oldboy, Bombay, and City of God. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

FILM 265. *FILMS FOR THE FUTURE. (4 Credits)
An interdisciplinary study of film, literary, and philosophical visions of the future. Three hours of lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

FILM 310. *FILM THEORY AND CRITICISM. (4 Credits)
Survey of significant works and movements in film theory and criticism, from classical to contemporary eras. Begins with the question of what distinguishes film from other visual arts, pursuing questions about the ontology of film, medium specificity, and aesthetics. Proceeds with investigations concerning issues of technology, authorship, genre, the avant-garde, gender, race and ethnicity, commercialism, transnationalism, queer theory, and affect. Weekly screenings will supplement class readings, lectures and discussions. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Prerequisites: FILM 110 with C or better or FILM 125 with C or better

FILM 360. INTERNATIONAL FILM FESTIVAL. (3 Credits)
Critical study of a selection of films screened at the Oregon State University’s International Film Festival. Topics include acting, sound, special effects, cinematography. CROSSLISTED as FILM 360/WLC 360.
Equivalent to: WLC 360
This course is repeatable for 9 credits.

FILM 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: FILM 399H
This course is repeatable for 16 credits.

FILM 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: FILM 399
This course is repeatable for 16 credits.

FILM 445. DOCUMENTARY FILM STUDIES. (4 Credits)
Examines the worldwide development of documentary filmmaking. We interrogate the nature, form, and function of non-fiction cinematic forms by analyzing diverse films, filmmakers, and theoretical models, while paying attention to social, technological, and aesthetic influences. We study significant modes of documentary including the city symphony, political documentary, direct cinema/cinema verite, and postmodern documentary. Finally, we will pay special attention to the cross-fertilization of non-fiction with other filmmaking modes. Throughout the course, we seek to answer the following questions: How do documentary conventions mark the ‘Real’? How is documentary film a tool for social change?

FILM 452. *STUDIES IN FILM. (4 Credits)
Particular cinematographers, movements, types, conventions, or problems in film. Topics change from term to term. Lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 452, ENG 452H, FILM 452H
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above.

FILM 452H. *STUDIES IN FILM. (4 Credits)
Particular cinematographers, movements, types, conventions, or problems in film. Topics change from term to term. Lecture and separate screenings each week. Film fee required. Not offered every year. (H) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core
Equivalent to: ENG 452, FILM 452
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above

FILM 480. STUDIES IN FILM, CULTURE AND SOCIETY. (4 Credits)
Study of film in its relationship to society and culture; study of film culture. Topics change from term to term. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: ENG 480
This course is repeatable for 8 credits.
Recommended: Sophomore standing; 8 credits of ENG 200-level or above

FILM 545. DOCUMENTARY FILM STUDIES. (4 Credits)
Examines the worldwide development of documentary filmmaking. We interrogate the nature, form, and function of non-fiction cinematic forms by analyzing diverse films, filmmakers, and theoretical models, while paying attention to social, technological, and aesthetic influences. We study significant modes of documentary including the city symphony, political documentary, direct cinema/cinema verite, and postmodern documentary. Finally, we will pay special attention to the cross-fertilization of non-fiction with other filmmaking modes. Throughout the course, we seek to answer the following questions: How do documentary conventions mark the ‘Real’? How is documentary film a tool for social change?
**Film (FIN)**

**FIN 552. STUDIES IN FILM. (4 Credits)**  
Particular cinematographers, movements, types, conventions, or problems in film. Topics change from term to term. Lecture and separate screenings each week. Film fee required. Not offered every year.  
*Equivalent to:* ENG 552  
This course is repeatable for 16 credits.

**FIN 580. STUDIES IN FILM, CULTURE AND SOCIETY. (4 Credits)**  
Study of film in its relationship to society and culture; study of film topics. Topics change from term to term.  
*Equivalent to:* ENG 580  
This course is repeatable for 8 credits.

**Finance (FIN)**

**FIN 340. FINANCE. (4 Credits)**  
Role and functions of a financial manager in the modern business environment in which a manager operates; formulation of financial objectives and policies; financial analysis, forecasting, planning, and control; asset management; capital budgeting; acquisition of funds through borrowing, stock issue, and by internal means; dividend policy; and international aspects of finance.  
*Prerequisites:* (BA 213 with C- or better or BA 215 with C- or better or BA 215H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])  
*Equivalent to:* BA 340, BA 340H, FIN 340H

**FIN 340H. FINANCE. (4 Credits)**  
Role and functions of a financial manager in the modern business environment in which a manager operates; formulation of financial objectives and policies; financial analysis, forecasting, planning, and control; asset management; capital budgeting; acquisition of funds through borrowing, stock issue, and by internal means; dividend policy; and international aspects of finance.  
*Attributes:* HNRS – Honors Course Designator  
*Prerequisites:* (BA 213 with C- or better or BA 215 with C- or better or BA 215H with C- or better) and (ECON 201 [C-] or ECON 201H [C-])  
*Equivalent to:* BA 340, BA 340H, FIN 340

**FIN 341. INVESTMENTS. (4 Credits)**  
Risk and reward characteristics of investments; sources of investment information; domestic and international security markets; investment characteristics of common stocks, debt securities, convertible securities, option contracts, and investment companies; real property investment; economic market analysis; technical market analysis; tax aspects of investments; and investment management.  
*Prerequisites:* BA 240 with C or better or BA 240H with C or better or BA 360 with C or better or BA 360H with C or better or FIN 340 with C or better or FIN 340H with C or better  
*Equivalent to:* BA 341

**FIN 342. ADVANCED FINANCIAL MANAGEMENT. (4 Credits)**  
Capital market theory and the valuation of risky assets, capital budgeting, valuing the firm's securities, capital structure theory, long-term financing alternatives, cost of capital, dividend policy, working capital management, financial analysis and planning, mergers, and takeovers.  
*Prerequisites:* FIN 340 with C or better or FIN 340H with C or better or BA 240 with C or better or BA 240H with C or better or BA 360 with C or better or BA 360H with C or better  
*Equivalent to:* BA 342

**FIN 343. CFA PREPARATION. (2-4 Credits)**  
Provides students with structure and guidance in their preparation for the Chartered Financial Analyst (CFA) Level exam. Students systematically prepare for and are tested on the 18 sections of the exam.  
*Equivalent to:* BA 434  
This course is repeatable for 4 credits.

**FIN 437. APPLIED PORTFOLIO MANAGEMENT. (2 Credits)**  
Hands-on experience of managing two investment portfolios. Each member in the Oregon State Investment Group (OSIG) should act as a financial analyst to analyze a chosen company by performing the Discounted Cash Flow (DCF) or Residual Income Model (RIM), the relative valuation, and the SWOT analyses. The weekly seminar offers opportunities for students to present their analyses and offer comments and suggestions to other's presentations.  
*Equivalent to:* BA 437

**FIN 438. APPLIED PORTFOLIO MANAGEMENT II. (1 Credit)**  
Each student will act as a financial analyst to analyze a chosen company using models learned in FIN 437. Provides students with an opportunity to practice security valuation and get familiar with the tools. In addition, this course will focus on various measures of portfolio performance.  
*Prerequisites:* FIN 437 with C- or better or BA 437 with C- or better  
*Equivalent to:* BA 438

**FIN 439. APPLIED PORTFOLIO MANAGEMENT III. (1 Credit)**  
Each student will act as a financial analyst to analyze a chosen company using models learned from FIN 437. Provides students additional opportunity to practice security valuation and strengthen their understanding of the tools. In addition, this course will introduce ways to develop an efficient portfolio.  
*Prerequisites:* FIN 437 with C- or better or BA 437 with C- or better  
*Equivalent to:* BA 439

**FIN 440. FIXED INCOME SECURITIES. (4 Credits)**  
Provides students with intermediate knowledge of fixed income assets, interest rate and interest rate theory, the tools for estimating values, and managing portfolios of fixed income assets. The course can also serve as a partial coverage of material expected of applicants planning on seeking the Certified Financial Analyst designation.  
*Prerequisites:* FIN 341 with C- or better

**FIN 441. FINANCIAL INSTITUTIONS. (4 Credits)**  
Introduction of markets and institutions that form the economic system of trading financial and real assets both domestically and internationally. The introduction of concepts of financial theory, institutional detail, regulatory environments, and the history of financial markets. Topics include legal, ethical, technological, and global issues facing financial managers, markets, and institutions.  
*Prerequisites:* BA 240 with C or better or BA 240H with C or better or BA 360 with C or better or BA 360H with C or better or FIN 340 with C or better or FIN 340H with C or better  
*Equivalent to:* BA 441

**FIN 442. FINANCIAL STATEMENT ANALYSIS. (4 Credits)**  
Student develop the understanding and skill to use financial statements for investment decisions, credit decisions, performance analysis, and forecasting. Three main topic areas: analysis overview, accounting analysis, and financial analysis.  
*Prerequisites:* FIN 342 with C- or better  
*Equivalent to:* BA 435
FIN 443. PORTFOLIO MANAGEMENT. (4 Credits)
An introduction to the construction, revision, and performance evaluation of financial asset portfolios.
Prerequisites: FIN 341 with C- or better or BA 341 with C- or better
Equivalent to: BA 443

FIN 444. FINANCIAL RISK MANAGEMENT. (4 Credits)
Investigation of financial hedging activities for corporations and financial institutions using futures, options, and other derivative securities.
Identification of risk attributes, valid hedging rationales, and management of hedging programs.
Prerequisites: FIN 341 with C- or better
Equivalent to: BA 444

FIN 445. INTERNATIONAL FINANCIAL MANAGEMENT. (4 Credits)
International monetary environment; foreign exchange risk management; source and availability of funds to finance trade and multinational operations; taxation planning and control; international portfolio diversification; international banking; capital budgeting; political risk evaluation of performance.
Prerequisites: FIN 341 with C- or better and FIN 342 [C-] and (FIN 440 [C-] or FIN 442 [C-] or FIN 443 [C-] or FIN 444 [C-] or FIN 499 [C-])
Equivalent to: BA 445

FIN 499. SELECTED TOPICS IN FINANCE. (1-4 Credits)
Examination of the impact of recent advances in finance on contemporary business. Topic will vary from term to term.
This course is repeatable for 16 credits.

FIN 542. INVESTMENTS. (3 Credits)
Introduction to the tools and concepts of security analysis and investments; basic security types, including stocks, bonds, options and futures, respective markets and to how these securities are traded; fundamental valuation techniques and theory for stocks and bonds.
Recommended: BA 360

FIN 543. PORTFOLIO MANAGEMENT. (4 Credits)
An introduction to the construction, revision, and performance evaluation of financial asset portfolios.
Prerequisites: FIN 542 with C or better

FIN 544. FINANCIAL RISK MANAGEMENT. (4 Credits)
Investigation of financial hedging activities for corporations and financial institutions using futures, options, and other derivative securities.
Identification of risk attributes, valid hedging rationales, and management of hedging programs.
Equivalent to: BA 544
Recommended: FIN 542

FIN 545. INTERNATIONAL FINANCIAL MANAGEMENT. (3 Credits)
International monetary environment; foreign exchange risk management; source and availability of funds to finance trade and multinational operations; taxation planning and control; international portfolio diversification; international banking; capital budgeting; political risk evaluation of performance.
Prerequisites: BA 540 with B- or better
Equivalent to: BA 545
Recommended: FIN 341 and FIN 342 and (FIN 440 or FIN 442 or FIN 443 or FIN 444 or FIN 499)

FIN 546. ADVANCED CORPORATE FINANCE. (3 Credits)
The second course in the Corporate Finance sequence. Examines corporate payout policies and capital structure choices, choices in debt financing, financial planning and working capital management, and valuation of projects using a real-options approach.
Prerequisites: BA 540 with B- or better

FIN 549. MERGERS AND ACQUISITIONS. (3 Credits)
Provides an in-depth examination of the theory and practice of the market for corporate control, primarily focusing on mergers and acquisitions (M&A). The objective of the course is to provide an understanding of how to structure, value, and implement an M&A transaction. Students will be expected to apply the appropriate tools and skills to evaluate M&A transactions.
Prerequisites: FIN 446 with B- or better

FIN 550. FUNDAMENTALS OF FINANCIAL PLANNING. (4 Credits)
Professional conduct and regulation, general financial planning principles, and education planning.

FIN 551. INSURANCE PLANNING AND TAX PLANNING. (4 Credits)
Risk management and insurance planning; tax fundamentals and income tax planning.
Prerequisites: FIN 550 with B- or better

FIN 552. FINANCIAL PLANNING II. (3 Credits)
Retirement planning; qualified and non-qualified retirement plans; IRAs; legal, tax, financial and non-financial aspects of estate planning; trusts; wills; wealth transfers.
Prerequisites: FIN 551 with C or better

FIN 553. FINANCIAL PLANNING III. (6 Credits)
Synthesis and integration of financial planning fundamentals to develop a comprehensive financial plan; client communication.
Prerequisites: FIN 552 with C or better

FIN 599. SELECTED TOPICS IN FINANCE. (1-4 Credits)
This course is repeatable for 16 credits.

FIN 640. FOUNDATIONS OF FINANCIAL RESEARCH. (3 Credits)
Provides an in-depth introduction to the foundations of financial research with an emphasis on theoretical developments and empirical research methods. Specific topics may change from quarter to quarter, but sample topics include theory of the firm, capital structure theory, dividend policy, and event study methodology.

FIN 641. CORPORATE FINANCE SEMINAR. (3 Credits)
Survey classic and contemporary research in the area of corporate finance. Specific topics may change from quarter to quarter, but sample topics include capital structure, dividend policy, agency theory, adverse selection and signaling, and non-cooperative games with and without complete information.

FIN 642. CAPITAL MARKETS. (3 Credits)
Surveys research on capital markets. Specific topics may change from quarter to quarter, but sample topics include asset pricing models, efficient markets vs behavioral finance, market volatility, volume, new issues market, and emerging markets.

Fisheries and Wildlife (FW)

FW 107. ORIENTATION TO FISHERIES AND WILDLIFE. (1 Credit)
Information relevant to academic pathways and career planning in the fields of fisheries and wildlife. Graded P/N.

FW 112. SCIENCE OF FLY FISHING TROUT. (1 Credit)
Uses fly fishing as a window into the larger world of science, art, and conservation, and more specifically into the structure and function of freshwater ecosystems. This class requires students to be concurrently registered for The Literature of Fly Fishing for Trout through English (ENG 225), and the Art of Fly Fishing through Physical Activity Courses (PAC 331).
Corequisites: ENG 225, PAC 331
FW 113. INTRODUCTION TO MARINE LIFE IN THE SEA-MARINE BIRDS AND MAMMALS. (1 Credit)
Introduces first- and second-year undergraduates, teachers and non-degree students to the breadth of marine science course offerings and research at Oregon State University's Hatfield Marine Science Center located in Newport, Oregon. Using an experiential based format, students collect field data to better understand marine mammals (whales, dolphins and porpoises), seabirds, and their interactions with their environment. Lec/lab. Graded P/N.

FW 199. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Equivalent to: FW 199H
This course is repeatable for 16 credits.

FW 199H. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: FW 199
This course is repeatable for 16 credits.

FW 209. CAREER SKILLS IN FISHERIES AND WILDLIFE SCIENCES. (1 Credit)
A foundation for life-long career development in fisheries and wildlife sciences. Practice the skills needed to search, apply, and attain internships and jobs. Graded P/N.
Prerequisites: FW 107 with P or better

FW 230X. HUMANS AND THE OCEAN. (3 Credits)
An introduction to marine science and the history of humans' interaction with the ocean. Lectures, group and individual library research, fieldtrips, and assignments will collate approaches from marine science, history, literary study, and other scientific and humanistic disciplines to introduce course material. Topics include oceanographic exploration, fishing and overfishing, and marine pollution. CROSSLISTED as ENG 230X/FW 230X/TOX 230X.
Equivalent to: ENG 230X, TOX 230X

FW 251. PRINCIPLES OF FISH AND WILDLIFE CONSERVATION. (3 Credits)
History of conservation and natural resource use; ecological principles, and social and economic limitations of conservation; principles and practices of wildlife and fisheries management; role of research in management.
Recommended: One course in introductory biology

FW 255. FIELD SAMPLING OF FISH AND WILDLIFE. (3 Credits)
Introduction to sampling populations and communities of vertebrate animals emphasizing sampling design, collection and management of data, and communication of results.
Recommended: WR 121 and familiarity with personal computers.

FW 289. COMMUNICATION SKILLS FOR FISHERIES AND WILDLIFE PROFESSIONALS. (4 Credits)
Introduces students to the theoretical and practical dimensions of interpersonal and public communication in a natural resource management field. Lec/rec.
Recommended: FW 251

FW 301. FIELD TECHNIQUES FOR MARINE MAMMAL CONSERVATION. (1 Credit)
A laboratory and hands-on experience covering field techniques, computer software for data organization and analyses, and understanding the practical management conservation application for students who are taking or have taken FW/BI 302, Biology and Conservation of Marine Mammals. Taught summer term at HMSC, Newport, OR.
Prerequisites: BI 302 (may be taken concurrently) with D- or better or FW 302 (may be taken concurrently) with D- or better

FW 302. BIOLOGY AND CONSERVATION OF MARINE MAMMALS. (4 Credits)
An examination of the biology of whales, pinnipeds, and other marine mammals, including general adaptations to a marine existence; systemsatics and biogeography; reproduction, diving physiology; communication and echolocation; feeding and migratory behavior; and marine mammal/human interactions; including conservation issues. Taught at Hatfield Marine Science Center OR online through Ecampus.
Equivalent to: BI 302
Recommended: One year of introductory biology

FW 303. SURVEY OF GEOGRAPHIC INFORMATION SYSTEMS IN NATURAL RESOURCE. (3 Credits)
Concepts underlying geographic information systems, global positioning system, and remote sensing; application to management and research, data quality issues, and case studies. Not a lab/skills class.

FW 307. SPECIALIZATION DEVELOPMENT. (1 Credit)
Students will examine career alternatives, develop career goals, learn what knowledge, skills, and abilities are important for diverse careers in fisheries and wildlife conservation, and develop an academic and lifelong plan for achieving their career goals. This course is intended to assist students in developing a specialization in fisheries and wildlife sciences. Graded P/N.
Equivalent to: FW 207
Recommended: FW 209

FW 311. ORNITHOLOGY. (3 Credits)
Survey of the adaptations of birds to a diverse array of habitats. Topics include origins, anatomy, reproductive strategies, migration, flight, behavior, physiology, nutrition, and conservation.
Recommended: One year introductory biology.

FW 312. SYSTEMATICS OF BIRDS. (2 Credits)
External anatomy, classification of birds of the world, and field identification of birds by sight and song. Field trips required.
Recommended: One year introductory biology.

FW 315. ICYTHOLOGY. (3 Credits)
A survey of the diversity of biological adaptations of fishes. Topics include physiological and zoogeographical adaptations, reproduction, evolution, cladogenesis, morphology, behavior, and genetics.
Equivalent to: FW 313
Recommended: One year introductory biology.

FW 316. SYSTEMATICS OF FISHES. (3 Credits)
Phylogenetic diversity, evolution, relationships and identification of the world's fishes, with particular focus on Oregon fishes. Includes identification, anatomy, use of keys, introduction to the comparative method, systematic theory, taxonomy, field collection and specimen curation. Lec/lab.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better or BI 204 with D- or better) and (BI 212 [D] or BI 212H [D-] or BI 205 [D-]) and (BI 213 [D-] or BI 213H [D-] or BI 206 [D-])
Recommended: FW 315
FW 317. MAMMALOGY. (3 Credits)
A survey of the origins, evolution, diversity, and adaptations of mammals to diverse environments. Topics include taxonomy, reproduction, sensory perception, herbivory, population cycles and behavior.
Recommended: One year introductory biology.

FW 318. SYSTEMATICS OF MAMMALS. (2 Credits)
A survey of the phylogenetic diversity of the mammals in Oregon from a habitat/community perspective. Identifying, using keys, and measuring specimens will be stressed.
Recommended: One year introductory biology.

FW 320. INTRODUCTORY POPULATION DYNAMICS. (4 Credits)
Principles and concepts of population dynamics related to fish and wildlife populations; methods of estimating abundance, mortality, sustainable harvest levels and extinction risk; hands-on introduction to models for population analysis. Lec/lab.
Prerequisites: BI 370 (may be taken concurrently) with D- or better or BI 370H (may be taken concurrently) with D- or better or BI 371 (may be taken concurrently) with D- or better
Recommended: Introductory statistics and mathematics equivalent to MTH 245 or higher

FW 321. APPLIED COMMUNITY AND ECOSYSTEM ECOLOGY. (3 Credits)
Perspectives in community and ecosystem ecology, and their use in management of fisheries and wildlife resource systems.
Prerequisites: FW 320 (may be taken concurrently) with D- or better

FW 323. MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST. (3 Credits)
Explores the nature of the salmon problem in the Northwest. Experts from diverse disciplines describe principles of salmon biology, habitat ecology and management, socioeconomics of direct and indirect users, and government policies.

FW 324. *FOOD FROM THE SEA. (3 Credits)
Where does seafood come from, and how does seafood arrive on a plate? How productive are the world's oceans, and can the oceans continue to produce enough to feed (and employ) the masses? How do different cultures, ethnicities, and regions of the world rely upon food from the sea for daily meals? Food from the Sea is an exploration of the cultural, societal, economic, practical, and environmental features of the protein that feeds billions. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

FW 325. *GLOBAL CRISSES IN RESOURCE ECOLOGY. (3 Credits)
Historical and contemporary implications of the impacts of burgeoning human populations on rates and patterns of global ecological change. Changes in ecosystem processes and crises of species extinction in the context of cultural and political institutions. (Bacc Core Course).
Attributes: CSGI – Core, Synth, Global Issues

FW 326. INTEGRATED WATERSHED MANAGEMENT. (3 Credits)
A comprehensive approach to watershed management, one that includes biophysical, socioeconomic, planning and education related topics. Intended for students interested in the sustainable management of natural resources.
Recommended: FW 251

FW 328. WILDLIFE CAPTURE AND IMMOBILIZATION. (2 Credits)
Manual and chemical restraint methods are covered with an emphasis on darting equipment, animal and human safety, drug pharmacology and species specific recommendations. CROSSLISTED as FW 328/VMB 328.
Equivalent to: VMB 328
This course is repeatable for 4 credits.

FW 331. ECOLOGY OF MARINE AND ESTUARINE BIRDS. (4 Credits)
Focusing on how marine and estuarine birds are adapted for life at sea. Topics include morphology, physiology, foraging ecology, and biogeography as well as introductory oceanography. Field trips.
Recommended: One year introductory biology.

FW 340. *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES. (3 Credits)
Explores multicultural influences on development of natural resources in the American West. Effects of diverse social values on changes in the physical landscape and biodiversity. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination Equivalent to: FW 340H

FW 341. FISH AND WILDLIFE LAW ENFORCEMENT. (2 Credits)
Introduction to the philosophy, purposes, and methods of enforcing natural resource laws, emphasizing fish and wildlife laws.

FW 345. *GLOBAL CHANGE BIOLOGY. (3 Credits)
Global Change Biology is the study of the impact of climate change on natural systems and actions to mitigate (slow) or adapt to climate change. Global climate change is having dramatic effects on natural resources including fish and wildlife populations and their habitats. Students will gain an understanding of the role that natural ecosystems (oceans, forests, wetlands, grasslands etc.) play in regulating the climate; how land use affects the earth's climate; how climate change will affect fish, wildlife and their habitats; and the role that managers and researchers can play in mitigating and adapting to climate change. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Introductory biology and ecology courses such as BI 370

FW 350. *ENDANGERED SPECIES, SOCIETY AND SUSTAINABILITY. (3 Credits)
Provides a general background to endangered species biology, and the social and economic implications of the legislation enacted to conserve endangered species (Endangered Species Act, CITES Treaty). (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: FW 251

FW 356. *CITIZEN SCIENCE. (3 Credits)
Citizen science involves non-specialists in scientific studies addressing large challenges best solved through collaboration. Citizens contribute data scientists may not otherwise be able to obtain, while improving their understanding of the scientific process, integrating technology into the learning process, and generating new knowledge for society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

FW 360. *ORIGINS OF F&W MANAGEMENT-EVOLUTION, GENETICS, AND ECOLOGY. (3 Credits)
Examines genetics and human interactions with fisheries and wildlife from an ecological and evolutionary perspective. Basic principles of environmental interactions, and how humans interact with other species and their environments in the disciplines commonly recognized as fisheries, wildlife and conservation sciences. (Baccalaureate Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Two terms of coursework at OSU
FW 366. ENVIRONMENTAL CONTAMINANTS IN FISH AND WILDLIFE. (3 Credits)
Environmental contamination is an important threat to many fish and wildlife populations and the habitats and prey upon which they rely. The field of ecotoxicology links the ecology of fish and wildlife with toxicology of environmental contaminants, and so spans political, scientific, and public relations realms. Through the pairing of introductory concepts with key case studies, this course provides students with a preparatory framework for understanding toxicological issues of importance for those focused on studying, managing or conserving fish and wildlife populations.
Prerequisites: (BI 204 with D- or better or BI 211 with D- or better or BI 211H with D- or better) and (BI 205 [D-] or BI 212 [D-] or BI 212H [D-])

FW 370. CONSERVATION GENETICS. (4 Credits)
A foundational course in preparation for a degree in Fisheries and Wildlife or other degrees focused on conservation of natural resources. Covers a broad range of topics associated with issues surrounding genetics that working professionals in the biological sciences should be conversant about. One of the most important aspects of the course is the development of problem-solving and critical-thinking skills.
Prerequisites: (BI 211 with D- or better or BI 204 with D- or better) and (BI 212 [D-] or BI 205 [D-]) and (BI 213 [D-] or BI 206 [D-])
Recommended: One year introductory biology

FW 391. *RIDGE TO REEF: SUSTAINABLE RESOURCE MANAGEMENT IN PALAU. (4 Credits)
How do small islands address issues of natural resource management, food security, and sustainability? What role do communities, governments, and non-profits play in addressing these issues? Can traditional ecological knowledge help solve these challenges? What about climate change on small islands? The Republic of Palau will be our classroom. Students will work with and learn from fishers, farmers, community leaders, traditional chiefs, terrestrial and marine biologists, and policy makers. Key topics include food security/production, climate change adaptation, protected area management, biocultural conservation, sustainable forest management, watershed management, sustainable development, coral reef and fisheries management, biodiversity measurement methods and ecosystem restoration.
Attributes: CSGI – Core, Synth, Global Issues

FW 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FW 403. THESIS. (1-16 Credits)
This course is repeatable for 32 credits.

FW 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FW 407. SEMINAR. (1-16 Credits)
Graded P/N. Taught at Hatfield Marine Science Center.
Equivalent to: FW 407H
This course is repeatable for 16 credits.

FW 407H. SEMINAR. (1-16 Credits)
Graded P/N. Taught at Hatfield Marine Science Center.
Attributes: HNRS – Honors Course Designator
Equivalent to: FW 407
This course is repeatable for 16 credits.

FW 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

FW 410. INTERNSHIP. (1-6 Credits)
This course is repeatable for 99 credits.

FW 415. FISHERIES AND WILDLIFE LAW AND POLICY. (3 Credits)
Provides students with an understanding of the key legal frameworks within which they will work to conserve fish and wildlife resources. Examines federal law and policy relating to allocation and conservation of fish and wildlife resources.
Recommended: PS 201 or other introductory political science course.

FW 418. URBAN ECOLOGY. (3 Credits)
Understand how an increasing human population increases pressure on fish and wildlife communities and resources within ecosystems. Examines the interactions between humans and animal species within urban areas and the effects of urbanization on species, communities, and ecosystems. Topics include conserving biodiversity, invasive species, human health and well-being, and urban planning.
Recommended: FW 255, BI 370

FW 419. THE NATURAL HISTORY OF WHALES AND WHALING. (3 Credits)
Addresses the natural history of whales as a unique example of adaptation in an evolutionary lineage, and the history of whaling as a general example of the failings of international resource management.
Recommended: Some background in vertebrate ecology and evolution or genetics

FW 421. AQUATIC BIOLOGICAL INVASIONS. (4 Credits)
An overview of the background, theory, evolution, ecology, politics and conservation of invasions by introduced species in aquatic environments. Taught at Hatfield Marine Science Center OR online through Ecampus.
Equivalent to: BI 421
Recommended: One year of university-level biology.

FW 422. INTRODUCTION TO OCEAN LAW. (3 Credits)
Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.

FW 426. COASTAL ECOLOGY AND RESOURCE MANAGEMENT. (5 Credits)
Study of the ecology and management of coastal marine and freshwater ecosystems as well as natural resources, emphasizing experimental (participatory) learning in a field station setting. Lec/lab.

FW 427. PRINCIPLES OF WILDLIFE DISEASES. (4 Credits)
Ecological aspects of important diseases affecting North American wildlife will be discussed. Demonstrations will mainly cover migratory birds, carnivores and ruminants. Lec/lab. Ecampus sections do not use lab demonstrations.

FW 433. POPULATION DYNAMICS FOR CONSERVATION. (4 Credits)
A synthesis of the principles of population dynamics from the viewpoint of a resource manager. Particular attention is paid to populations structured by age, size, or over space, and considering both fisheries and wildlife management. Laboratory work uses computer programming in the R language to implement examples from lecture.
Prerequisites: (FW 320 with C or better or BI 483 with C or better) and ((MTH 227 with C or better or MTH 228 with C or better) or (MTH 251 with C or better or MTH 252 with C or better))
FW 434. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. CROSSLISTED as FW 434/OC 434 and FW 534/OC 534.
Equivalent to: OC 434

FW 435. *WILDLIFE IN AGRICULTURAL ECOSYSTEMS. (3 Credits)
Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: BI 370 and FW 251

FW 439. *HUMAN DIMENSIONS OF FISHERIES AND WILDLIFE MANAGEMENT. (3 Credits)
Students build an understanding and appreciation for the role of human dimensions (HD) in fisheries and wildlife management. Students work both independently and in groups on assignments with an HD focus. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: FES 439
Recommended: Principles of fish and wildlife conservation or natural resources and introductory statistics.

FW 445. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FES 445, FOR 445
Recommended: BI 370 or BI 370H

FW 451. AVIAN CONSERVATION AND MANAGEMENT. (3 Credits)
Identification, classification, life history strategies, ecology and management of upland and migratory birds.
Recommended: FW 311

FW 452. BIODIVERSITY CONSERVATION IN MANAGED FORESTS. (3 Credits)
Designed for students in forestry, wildlife, fisheries and related fields. Introduces the concepts of, and approaches to, managing forest stands, landscapes and regions to achieve desired habitat conditions for indicator species and conservation of biological diversity. CROSSLISTED as FES 452/FW 452.
Equivalent to: FES 452
Recommended: FES 240 or FES 341 or BI 370

FW 454. *FISHERY BIOLOGY. (4 Credits)
Principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: FW 315 with D- or better and FW 320 [D-]

FW 456. FRESHWATER ECOLOGY AND CONSERVATION. (5 Credits)
Physical, chemical, biological, and environmental concepts in continental aquatic systems. Includes techniques related to assessing aquatic resources their management and conservation. Lec/lab.
Prerequisites: BI 370 with D- or better or BI 371 with D- or better
Recommended: 9 credits of upper-division biological sciences

FW 458. MAMMAL CONSERVATION AND MANAGEMENT. (4 Credits)
A thorough understanding of the management, conservation, and ecology of mammals in North America; includes population dynamics, harvest management, techniques to determine abundance, diets, reproduction, and the cultural and political variables that contribute to formulation of management programs.
Recommended: 9 credits of upper-division biological sciences.

FW 462. ECOSYSTEM SERVICES. (3 Credits)
Introduces students to the ecological, economic, and social/ethical issues involved in the study of ecosystem services, with a major focus on biological components involved in ecosystem services. Topics covered include: 1) an introduction to the roles that living organisms play in the provision of ecosystem services, 2) the relationship of ecosystem functions and services, 3) the societal factors that influence this relationship, 4) general categories of ecosystem services, 5) identification of potential ecosystem services in terrestrial and aquatic systems, 6) an overview of the methods of valuation, and 7) translating ecosystems functions to services. Case studies will be used to illustrate key concepts and relationships within different ecological and social contexts.
Recommended: BI 370

FW 464. MARINE CONSERVATION BIOLOGY. (3 Credits)
Lectures, group library research, and class debates on current issues regarding the conservation of biodiversity in the sea. Topics include overfishing, invasive species, eutrophication, marine pollution, and global warming, as well as means of addressing these threats.
Prerequisites: BI 370 with D- or better or BI 370H with D- or better
Equivalent to: BI 464

FW 465. MARINE FISHERIES. (4 Credits)
A global perspective on commercial fish and shellfish harvesting with emphasis on fishing technology and policy issues. Offered fall term in odd years.
Recommended: FW 315

FW 467. ANTARCTIC SCIENCE AND CONSERVATION. (4 Credits)
Explores the history, geology, climate, and ecosystems of Antarctica, with an emphasis on current research and conservation issues. Focuses on critical thinking skills developed through independent research on a topic of interest, an internal peer review project, and discussions of relevant case studies in Antarctic research.

FW 469. METHODS IN PHYSIOLOGY AND BEHAVIOR OF MARINE MEGAFUNA. (3 Credits)
An in-depth study of marine megafauna (mammals, birds, turtles) with an emphasis on methods and analyses of behavior and physiology for conservation. Lab and field exercises include investigations into the behavior-physiology nexus of diving, migration, thermoregulation, energy expenditure, and mating systems. Research techniques to be explored will include, for example, tracking and remote biotelemetry monitoring technologies, respirometry, genetics, and direct field study observation. Theoretical approaches, field techniques and statistical analyses will help prepare students for a career in fisheries or wildlife science. Lec/lab. Taught at HMSC.
Recommended: One year of introductory biology and nine credits of upper-division FW or BI courses
FW 470. *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN. (3 Credits)
Integrates environmental history and landscape ecology of the Columbia River Basin from geologic origins to the present, to create an understanding of change caused by natural processes and human activities. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: HSTS 470
Recommended: (HST 201 and HST 202 and HST 203) or BI 370

FW 471. ENVIRONMENTAL PHYSIOLOGY OF FISHES. (4 Credits)
Principles of the functional biology of fishes with emphasis on environmental interactions and management implications.
Recommended: FW 315 and (BI 370 or BI 371)

FW 473. FISH ECOLOGY. (4 Credits)
Behavior of fishes as a mode of accommodation to various ecological and evolutionary constraints. Importance of inheritable and learned patterns to population and community dynamics. Application of behavioral studies to the solution of management problems. Lec/lab/rec.
Prerequisites: (BI 370 with D- or better or BI 370H with D- or better) and FW 315 [D-]

FW 474. EARLY LIFE HISTORY OF FISHES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years.
Recommended: FW 315

FW 475. WILDLIFE BEHAVIOR. (4 Credits)
Recommended: 9 credits of upper-division biology.

FW 476. FISH PHYSIOLOGY. (4 Credits)
Physiological specializations and adaptations of major groups of fishes.
Prerequisites: FW 315 with D- or better

FW 477. AGE AND GROWTH OF FISH. (3 Credits)
An overview of the terminology, theory, assumptions, limitations, error, and processing and ageing techniques for different types of calcified structures used to age fishes.
Prerequisites: FW 454 with D- or better
Recommended: Introductory statistics

FW 479. WETLANDS AND RIPARIAN ECOLOGY. (3 Credits)
Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Recommended: BI 370 or BI 371

FW 481. WILDLIFE ECOLOGY. (3 Credits)
Interrelationships of wildlife, environmental change. Predicting and measuring responses of wildlife to altered habitat conditions.
Prerequisites: BI 370 with D- or better or BI 370H with D- or better or BI 371 with D- or better

FW 488. PROBLEM SOLVING IN FISHERIES AND WILDLIFE SCIENCE. (3 Credits)
A capstone course designed to introduce students to the synthesis of scientific information on species, habitats and ecosystems and the use of such data in shaping fisheries and wildlife conservation, management and policy. Includes a group problem-solving project and case studies. For FW majors in their senior year.
Prerequisites: FW 320 with D- or better and FW 321 (may be taken concurrently) [D-]
Recommended: 400-level FW course work (e.g., FW 426 or FW 454 or FW 481)

FW 489. EFFECTIVE COMMUNICATIONS IN FISHERIES AND WILDLIFE SCIENCE. (3 Credits)
Centers on the synthesis and interpretation of data and effective communication of that information in written and oral communication to diverse audiences including scientists, managers, administrators and the general public.

FW 491. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSTLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: MB 491
Recommended: 9 credits of upper-division fisheries biology.

FW 493. FIELD METHODS FOR MARINE RESEARCH. (3 Credits)
The primary focus is providing hands-on experience in a small class exploring various field sampling methodologies, research planning logistics, and field operations in estuarine and nearshore environments. Topics covered include measurement and collection methods, animal handling techniques, equipment care and handling, sampling strategy, experimental design, data management planning and, if possible, small boat work.
Recommended: One year of biology

FW 496. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSTLISTED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: MB 496
Recommended: MB 303 or other upper-division laboratory course.

FW 497. *AQUACULTURE. (3 Credits)
Principles and practices for the aquaculture of fish, shellfish, and algae. (Writing Intensive Course.)
Attributes: CWIC – Core, Skills, WIC
Recommended: 9 credits of upper-division biology.

FW 498. AQUACULTURE LABORATORY. (3 Credits)
Biological and culture requirements of fish, shellfish, and algae. Emphasis on laboratory culture techniques and practical experience in handling organisms. Taught at Hatfield Marine Science Center.
Recommended: 9 credits of upper-division biology.

FW 499. SPECIAL TOPICS IN FISHERIES AND WILDLIFE. (0-16 Credits)
Various topics in fisheries science and wildlife science. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: ENT 499
This course is repeatable for 16 credits.

FW 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FW 502. TEACHING METHODS IN FISHERIES AND WILDLIFE. (1 Credit)
This is a discussion course designed to help new GTAs and instructors who are learning the trials and tribulations of university-level teaching in our department. This is a great course for students who are interested in hearing more about teaching approaches, grading and assessment, student communication, problem students, and development of teaching
Graded P/N.

FW 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
FW 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FW 506. PROJECTS. (1-6 Credits)
Projects are synthesis papers or outreach products that are developed with a mentor from campus, a natural resource agency, or the student’s place of employment. The purpose of your project is to contribute to the field of study with a product that reflects the principles and applications learned in your classes.
This course is repeatable for 12 credits.

FW 507. SEMINAR. (1-16 Credits)
Selected Topics. Taught at Hatfield Marine Science Center and Corvallis campus.
This course is repeatable for 16 credits.

FW 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

FW 510. PROFESSIONAL INTERNSHIP. (1-16 Credits)
This course is repeatable for 10 credits.

FW 514. PROFESSIONAL DEVELOPMENT: MEETING COMMUNICATIONS. (1 Credit)
Fisheries and wildlife professionals use meetings of scientists, managers and stakeholders to communicate key findings and develop consensus recommendations for policy. This 1-credit experiential learning course will expose students to a scientific or management meeting in their chosen field (fisheries, wildlife, ecology, or conservation biology) and get them to think about how meetings function as well as their content.
This course is repeatable for 3 credits.

FW 515. FISHERIES AND WILDLIFE LAW AND POLICY. (3 Credits)
Examines federal law and policy relating to allocation and conservation of fish and wildlife resources.
Recommended: PS 201 or other introductory political science course.

FW 518. URBAN ECOLOGY. (3 Credits)
Understand how an increasing human population increases pressure on fish and wildlife communities and resources within ecosystems. Examines the interactions between humans and animal species within urban areas and the effects of urbanization on species, communities, and ecosystems. Topics include conserving biodiversity, invasive species, human health and well-being, and urban planning.

FW 519. THE NATURAL HISTORY OF WHALES AND WHALING. (3 Credits)
Addresses the natural history of whales as a unique example of adaptation in an evolutionary lineage, and the history of whaling as a general example of the failings of international resource management.
Recommended: Some background in vertebrate ecology and evolution or genetics

FW 521. AQUATIC BIOLOGICAL INVASIONS. (4 Credits)
An overview of the background, theory, evolution, ecology, politics and conservation of invasions by introduced species in aquatic environments. Taught at Hatfield Marine Science Center OR online through Ecampus.
Recommended: One year of university-level biology.

FW 522. INTRODUCTION TO OCEAN LAW. (3 Credits)
Examination of US law and primary international law focused on fisheries management with coverage of regulation of other ocean resources including energy, marine mammals, endangered species, pollution, and protected areas. Final project is intended to provide students with hands-on exposure to real-world fisheries and ocean management issues.

FW 523. MONITORING WILDLIFE POPULATIONS AND THEIR HABITATS. (3 Credits)
An overview of monitoring plan design and the conceptual background needed to understand and critique monitoring plans, and have the basic skills to develop and implement a monitoring program as part of an interdisciplinary team.
Recommended: Introductory course in statistics and introductory course in ecology.

FW 524. INTRODUCTION TO FISHERIES ASSESSMENT. (3 Credits)
Fisheries management strategies rely on models that predict a population’s responses to exploitation. This course introduces approaches commonly used to assess and evaluate the dynamics and status of a population. Provides an overview of the terminology, data requirements, underlying rationale, assumptions, limitations and uncertainty associated with stock assessments.
Recommended: College algebra, introductory statistics and, if unfamiliar with data collection and analysis methods in fisheries, FW 454/554

FW 526. COASTAL ECOLOGY AND RESOURCE MANAGEMENT. (5 Credits)
Study of the ecology and management of coastal marine and freshwater ecosystems as well as natural resources, emphasizing experimental (participatory) learning in a field station setting. Lec/lab.

FW 527. PRINCIPLES OF WILDLIFE DISEASES. (4 Credits)
Ecological aspects of important diseases affecting North American wildlife will be discussed. Demonstrations will mainly cover migratory birds, carnivores and ruminants. Lec/lab. Ecampus sections do not use lab demonstrations.

FW 528. DIVERSITY AND IDENTIFICATION OF LARVAL FISHES. (3 Credits)
Research on early life history stages of fishes has increased considerably in recent years, due to its importance in many research fields, such as fisheries science and oceanography, species conservation, systematics and morphology. Simultaneously, the ability to identify ichthyoplankton has decreased. This course is intended to provide students with an understanding of the evolutionary diversity of ichthyoplankton of the world.
Recommended: A completed 300-level systematics of fishes, ichthyology or comparative anatomy course.

FW 529. ICHTHYOPLANKTON IDENTIFICATION LABORATORY. (2 Credits)
Larval fishes are important in many research fields, and are part of many natural history collections. However, often museums are unable to provide the curatorial needs due to the lack of trained personnel. The lab will provide students with the necessary practical skills to identify larval fishes. Distinctive from the course 528, where students learn about the diversity and evolution of larval fish characters, the laboratory is designed to the identification of larvae from a real collection. Students are encouraged to bring unidentified ichthyoplankton samples or mixed species lots to the course to help with their identification.

FW 533. POPULATION DYNAMICS FOR CONSERVATION. (4 Credits)
A synthesis of the principles of population dynamics from the viewpoint of a resource manager. Particular attention is paid to populations structured by age, size, or over space, and considering both fisheries and wildlife management. Laboratory work uses computer programming in the R language to implement examples from lecture.
Prerequisites: IB 592 with C or better
Recommended: (MTH 227 and MTH 228) or (MTH 251 and MTH 252)
**FW 534. ESTUARINE ECOLOGY. (4 Credits)**
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. CROSSLISTED as OC 434/OC 434 and FW 534/OC 534.
Equivalent to: OC 534

**FW 535. WILDLIFE IN AGRICULTURAL ECOSYSTEMS. (3 Credits)**
Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips.
Recommended: One year of college-level mathematics and one quarter of fish and wildlife management

**FW 537. STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT. (2 Credits)**
Structured decision making (SDM) is used for making natural resource management and policy decisions. It is an ideal framework for interdisciplinary teams to cooperate and identify the most effective management strategies. Graduate students from diverse backgrounds (natural resources, political science, others) are provided with an understanding of the SDM process.
Recommended: One year of college-level mathematics and one quarter of fish and wildlife management

**FW 538. STRUCTURED DECISION MAKING IN NATURAL RESOURCE MANAGEMENT LAB. (2 Credits)**
Students who are taking or have taken FW 537 are provided with the understanding of and ability to employ the techniques needed to build models that are used during the structured decision-making process. The laboratory emphasizes the use of graphical models and basic statistical techniques for building decision-making models. Lec/lab.
Prerequisites: FW 537 (may be taken concurrently) with D- or better

**FW 540. VERTEBRATE POPULATION DYNAMICS. (4 Credits)**
Concepts in population ecology and quantitative approaches to managing wildlife populations; methods of parameter estimation, model structure, assumptions, and analysis, applications to common management issues.
Recommended: Upper-division population ecology and basic statistics courses

**FW 544. QUANTITATIVE DECISION ANALYSIS FOR FISH AND WILDLIFE MANAGEMENT. (4 Credits)**
Decision analysis allows decision makers to examine the expected effects of different strategies before implementation; incorporate multiple objectives and values of stakeholders; determine the relative influence of various sources of uncertainty; and estimate the value of collecting additional data. Quantitatively oriented graduate students in natural resources are provided with an in-depth overview of decision analysis and adaptive management, emphasizing animal population management.
Lec/lab.
Recommended: ST 511 and ST 512 or equivalent, basic background in animal population dynamics and management.

**FW 545. ECOLOGICAL RESTORATION. (4 Credits)**
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FES 545, FOR 545
Recommended: BI 370 or BI 370H

**FW 549. HISTORY OF FISHERIES SCIENCE. (3 Credits)**
Surveys the development of fisheries science, professionalization of the discipline, patronage, and the political, economic, and social context in which fisheries science operates.

**FW 550. TROPHIC CASCADES. (2-3 Credits)**
Theory and empirical analysis of terrestrial carnivore effects on plants and ecosystems as mediated through herbivores. Emphasis on large carnivores, frequency/strength of trophic cascades, implications for ecosystem function, management, and restoration. Lectures, current literature, discussions, field exercise, term paper, and student presentations. CROSSLISTED as FES 550/FW 550.
Equivalent to: FES 550, FOR 547, FW 547
This course is repeatable for 3 credits.

**FW 551. AVIAN CONSERVATION AND MANAGEMENT. (3 Credits)**
Identification, classification, life history strategies, ecology and management of upland and migratory birds.
Recommended: FW 311 or equivalent course work.

**FW 552. FOREST WILDLIFE HABITAT MANAGEMENT. (4 Credits)**
Management of terrestrial vertebrates in forest ecosystems. Effects on silvicultural practices and landscape pattern on habitats and populations. CROSSLISTED as FES 552/FW 552.
Equivalent to: FES 552
Recommended: FOR 341 or equivalent course in ecology.

**FW 554. FISHERY BIOLOGY. (4 Credits)**
Principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management.
Recommended: FW 315 and FW 320

**FW 556. FRESHWATER ECOLOGY AND CONSERVATION. (5 Credits)**
Physical, chemical, biological, and environmental concepts in continental aquatic systems. Includes techniques related to assessing aquatic resources their management and conservation. Lec/lab.
Recommended: BI 370 or BI 371 or 9 credits of upper-division biological sciences

**FW 558. MAMMAL CONSERVATION AND MANAGEMENT. (4 Credits)**
A thorough understanding of the management, conservation, and ecology of mammals in North America; includes population dynamics, harvest management, techniques to determine abundance, diets, reproduction, and the cultural and political variables that contribute to formulation of management programs.
Recommended: 9 credits of upper-division biological sciences.
FW 560. PSYCHOLOGY OF ENVIRONMENTAL DECISIONS. (3 Credits)
Natural resource management and conservation programs have one thing in common: to be effective, they must consider how and why humans make decisions. This course approaches this topic from a psychological lens and will cover the psychological processes associated with making individual and group decisions, common biases and heuristics in our decision-making, and how these apply to diverse natural resource management and conservation issues. Students will learn how to take these aspects of human decision making into consideration when participating in or facilitating collaborative environmental programs.

Recommended:
Taught at HMSC.
help prepare students for a career in fisheries or wildlife science. Lec/lab.
Theoretical approaches, field techniques and statistical analyses will and relationships within different ecological and social contexts.
technologies, respirometry, genetics, and direct field study observation.
functions to services. Case studies will be used to illustrate key concepts will include, for example, tracking and remote biotelemetry monitoring
of potential ecosystem services in terrestrial and aquatic systems, 6) identification an overview of the methods of valuation, and 7) translating ecosystems functions to services. Case studies will be used to illustrate key concepts and relationships within different ecological and social contexts.
Recommended: BI 370 or equivalent course work.
FW 563. CONSERVATION BIOLOGY OF WILDLIFE. (3 Credits)
Overview of the field of conservation biology with emphasis on the relationship to conservation and management of wildlife.

FW 564. MARINE CONSERVATION BIOLOGY. (3 Credits)
Lectures, group library research, and class debates on current issues regarding the conservation of biodiversity in the sea. Topics include overfishing, invasive species, eutrophication, marine pollution, and global warming, as well as means of addressing these threats.
Equivalent to: BI 564
Recommended: BI 370 or BI 370H
FW 565. MARINE FISHERIES. (4 Credits)
A global perspective on commercial fish and shellfish harvesting with emphasis on fishing technology and policy issues. Offered fall term in odd years.
Recommended: FW 315

FW 567. ANTARCTIC SCIENCE AND CONSERVATION. (4 Credits)
Explores the history, geology, climate, and ecosystems of Antarctica, with an emphasis on current research and conservation issues. Focuses on critical thinking skills developed through independent research on a topic of interest, an internal peer review project, and discussions of relevant case studies in Antarctic research.

FW 569. BEHAVIOR AND PHYSIOLOGY OF MARINE MEGAFUNA. (3 Credits)
An in-depth study of marine megafauna (mammals, birds, turtles) with an emphasis on methods and analyses of behavior and physiology for conservation. Lab and field exercises include investigations into the behavior—physiology nexus of diving, migration, thermoregulation, energy expenditure, and mating systems. Research techniques to be explored will include, for example, tracking and remote biotelemetry monitoring technologies, respirometry, genetics, and direct field study observation. Theoretical approaches, field techniques and statistical analyses will help prepare students for a career in fisheries or wildlife science. Lec/lab. Taught at HMSC.
Recommended: One year of introductory biology and nine credits of upper-division courses in Fisheries and Wildlife or biological sciences in their undergraduate program.

FW 570. ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN. (3 Credits)
Integrates environmental history and landscape ecology of the Columbia River Basin from geologic origins to the present, to create an understanding of change caused by natural processes and human activities.
Equivalent to: HSTS 570
Recommended: (HST 201 and HST 202 and HST 203) or BI 370
FW 571. ENVIRONMENTAL PHYSIOLOGY OF FISHES. (4 Credits)
Principles of the functional biology of fishes with emphasis on environmental interactions and management implications.
Recommended: FW 315 and (BI 370 or BI 371)
FW 573. FISH ECOLOGY AND CONSERVATION. (4 Credits)
Behavior of fishes as a mode of accommodation to various ecological and evolutionary constraints. Importance of heritable and learned patterns to population and community dynamics. Application of behavioral studies to the solution of management problems.
Recommended: BI 370 and FW 315
FW 574. EARLY LIFE HISTORY OF FISHES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years.
CROSSLISTED as FW 574/OC 574.
Equivalent to: OC 574
Recommended: FW 315
FW 575. WILDLIFE BEHAVIOR. (4 Credits)
Equivalent to: FW 585
Recommended: 9 credits of upper-division biology.
FW 576. FISH PHYSIOLOGY. (4 Credits)
Physiological specializations and adaptations of major groups of fishes.
Recommended: FW 315
FW 578. STREAM ECOLOGY. (3 Credits)
Structure and function of stream ecosystems, with emphasis on biological processes; physical and chemical relations; riparian influences and landscape perspectives.
Recommended: 9 credits of upper-division science.

FW 579. WETLANDS AND RIPARIAN ECOLOGY. (3 Credits)
Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Recommended: BI 370 or BI 371
FW 580. SPECIES RECOVERY PLANNING AND RESTORATION. (3 Credits)
The importance of communication in science is stressed and a broad knowledge of endangered species-related information is provided. Students develop the ability to critically evaluate published information in scientific literature and to present and summarize it as part of the collaborative species recovery planning process with a varied audience of stakeholders.
Recommended: FW 563 and FW 573

 FW 581. WILDLIFE ECOLOGY. (3 Credits)
Interrelationships of wildlife, environment and humans. Evaluation of properties and habitats of wildlife populations.
Recommended: (BI 370 or BI 371) and FW 311 and FW 320 and ST 351
FW 585. STREAM ECOLOGY. (3 Credits)
Structure and function of stream ecosystems, with emphasis on biological processes; physical and chemical relations; riparian influences and landscape perspectives.
Recommended: 9 credits of upper-division science.

FW 574. EARLY LIFE HISTORY OF FISHES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years.
CROSSLISTED as FW 574/OC 574.
Equivalent to: OC 574
Recommended: FW 315
FW 575. WILDLIFE BEHAVIOR. (4 Credits)
Equivalent to: FW 585
Recommended: 9 credits of upper-division biology.
FW 576. FISH PHYSIOLOGY. (4 Credits)
Physiological specializations and adaptations of major groups of fishes.
Recommended: FW 315
FW 578. STREAM ECOLOGY. (3 Credits)
Structure and function of stream ecosystems, with emphasis on biological processes; physical and chemical relations; riparian influences and landscape perspectives.
Recommended: 9 credits of upper-division science.

FW 579. WETLANDS AND RIPARIAN ECOLOGY. (3 Credits)
Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.
Recommended: BI 370 or BI 371
FW 580. STREAM ECOLOGY. (3 Credits)
Structure and function of stream ecosystems, with emphasis on biological processes; physical and chemical relations; riparian influences and landscape perspectives.
Recommended: 9 credits of upper-division science.

FW 581. WILDLIFE ECOLOGY. (3 Credits)
Interrelationships of wildlife, environment and humans. Evaluation of properties and habitats of wildlife populations.
Recommended: (BI 370 or BI 371) and FW 311 and FW 320 and ST 351
FW 583. SPECIES RECOVERY PLANNING AND RESTORATION. (3 Credits)
The importance of communication in science is stressed and a broad knowledge of endangered species-related information is provided. Students develop the ability to critically evaluate published information in scientific literature and to present and summarize it as part of the collaborative species recovery planning process with a varied audience of stakeholders.
Recommended: FW 563 and FW 573
FW 591. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: MB 591
Recommended: 9 credits of upper-division fisheries biology.

FW 596. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSLISTED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: MB 596
Recommended: MB 303 or other upper-division laboratory course.

FW 597. AQUACULTURE. (3 Credits)
Principles and practices for the aquaculture of fish, shellfish, and algae.
Recommended: 9 credits of upper-division biology.

FW 598. AQUACULTURE LABORATORY. (3 Credits)
Biological and culture requirements of fish, shellfish, and algae. Emphasis on laboratory culture techniques and practical experience in handling organisms. Taught at Hatfield Marine Science Center.
Recommended: 9 credits of upper-division biology.

FW 599. SPECIAL TOPICS IN FISHERIES AND WILDLIFE. (0-16 Credits)
Various topics in fisheries science and wildlife science. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: ENT 499
This course is repeatable for 99 credits.

FW 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FW 603. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

FW 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FW 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FW 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FW 620. ECOLOGICAL POLICY. (3 Credits)
Policy issues associated with ecosystem management, risk assessment, biological diversity, ecosystem health, sustainability, invasive species, bioregionalism, globalization and transnational factors, and rights, ethics, and morals.
Recommended: Background in natural resources, environmental sciences, ecological sciences, ecological economics, political science, or similar discipline.

FW 661. ANALYSIS OF ANIMAL POPULATIONS. (5 Credits)
Quantitative methods for estimating parameters (abundance, survival, population stability) of animal populations. Emphasis is on vertebrate animals and statistical methods of hypothesis testing, parameter estimation, and inference testing. Offered odd-numbered years.
Recommended: ST 511 and ST 512 or equivalent

FW 699. SPECIAL TOPICS IN FISHERIES AND WILDLIFE. (1-4 Credits)
Various topics in fisheries science and wildlife science. Taught at Hatfield Marine Science Center and Corvallis campus.
This course is repeatable for 8 credits.

FW 808. WORKSHOP. (1-16 Credits)

Food in Culture, Social Justice (FCSJ)

FCSJ 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 261. *FOOD IN AMERICAN CULTURE. (3 Credits)
Fosters understanding of the meanings of foods and foodways in American culture. Uses food as a lens to explore general topic areas such as work, family, ecology, and identity. Critically examines core issues that shape and have shaped American culture. CROSSLISTED as ANTH 261/FC 261. (Bacc Core Course) (SS)
Attributes: CPWC – Core, Pers, West Culture; LACS – Liberal Arts Social Core
Equivalent to: ANTH 261

FCSJ 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 361. *FOOD JUSTICE. (4Credits)
Contemporary food systems are examined from a cultural and social justice perspective. The human right to food as recognized by the United Nations serves as the justice grounding point. Impediments to realizing the right to food will be examined in national and international contexts. CROSSLISTED as ANTH 361/FCSJ 361. (Bacc Core Course) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Equivalent to: ANTH 361

FCSJ 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 403. THESIS. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 405. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 406. FOOD PROJECTS. (1-6 Credits)
Graded P/N.
This course is repeatable for 6 credits.

FCSJ 407. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.

FCSJ 410. INTERNSHIP. (1-16 Credits)
Opportunities for students to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members.
This course is repeatable for 16 credits.
Recommended: 6 credits of FCSJ
FCSJ 422. INTERCULTURAL LEARNING COMMUNITY. (3-6 Credits)
Taught as a learning community combining students, professors and community members to explore contemporary food-related questions in two different countries. Syllabus content will change depending on 1) The countries chosen, 2) The questions that are most of interest to the members of the community. Depending on the year, up to 25% of the time might be spent on the Corvallis campus.
Prerequisites: FCSJ 454 with C- or better
This course is repeatable for 6 credits.

FCSJ 444. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, paleodietary assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Prerequisites: ANTH 240 with C or better or ANTH 330 with C or better
Equivalent to: ANTH 444

FCSJ 454. *INTERNATIONAL PERSPECTIVES ON FOOD SYSTEMS. (4 Credits)
Macro and micro-comparative overview of food systems in at least two different international settings, highlighting the influences of culture, social structure, geography, and economy on food systems. Non-traditional and emerging theoretical critiques of such influences on food systems are highlighted. (Bacc Core Course) (H) (SS) (NC)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core; LACS – Liberal Arts Social Core

FCSJ 464. FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders in two different international settings, highlighting the influences of culture, social structure, geography, and economy on food systems. Non-traditional and emerging theoretical critiques of such influences on food systems are highlighted. (Bacc Core Course) (H) (SS) (NC)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: ES 464

FCSJ 467. CAPSTONE: FOOD IN CULTURE AND SOCIAL JUSTICE. (1 Credit)
Working under the supervision of a Food in Culture and Social Justice faculty person, students further engage with a topic previously explored in FCSJ course work and produce a 5-page paper and public poster, presentation or website that demonstrates critical thinking and writing competencies about food, culture and social justice. Graded P/N.
Equivalent to: ANTH 467
Recommended: Completion or concurrent enrollment in the last coursework for the FCSJ undergraduate certificate

FCSJ 486. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Attributes: LACS – Liberal Arts Social Core
Equivalent to: ANTH 486
Recommended: 3 credits of social science.

FCSJ 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FCSJ 501. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 503. THESIS. (1-12 Credits)
This course is repeatable for 999 credits.

FCSJ 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

FCSJ 506. FOOD PROJECTS. (1-6 Credits)
Graded P/N.
This course is repeatable for 6 credits.

FCSJ 507. SEMINAR. (1-3 Credits)
This course is repeatable for 16 credits.

FCSJ 510. GRADUATE INTERNSHIP. (1-16 Credits)
Opportunities for students to take advantage of off-campus work experiences during regular term sessions for academic credit. Allows students to broaden and deepen their understanding and appreciation of the value of their academic activity. Internship is supervised and evaluated by individual faculty members.
This course is repeatable for 16 credits.
Recommended: 6 credits of FCSJ

FCSJ 522. INTERCULTURAL LEARNING COMMUNITY. (3-6 Credits)
Taught as a learning community combining students, professors and community members to explore contemporary food-related questions in two different countries. Syllabus content will change depending on 1) The countries chosen, 2) The questions that are most of interest to the members of the community. Depending on the year, up to 25% of the time might be spent on the Corvallis campus.
Prerequisites: FCSJ 554 with C or better
This course is repeatable for 6 credits.

FCSJ 544. NUTRITIONAL ANTHROPOLOGY. (4 Credits)
Examines human nutrition and food systems from comparative, biocultural and evolutionary perspectives. Long-term evolutionary processes are examined within an ecological framework as significant factors affecting human biology and susceptibility to diet-related disease. An emphasis on anthropological methods in nutritional assessment including anthropometry, paleodietary assessment and nutritional participant-observation will provide students with the tools to evaluate human diet from skeletal and fossil collections through contemporary cross-cultural populations. CROSSLISTED as ANTH 444/FCSJ 444 and ANTH 544/FCSJ 544.
Equivalent to: ANTH 544
Recommended: ANTH 240 or ANTH 330
FCSJ 547. METHODS IN FOOD IN CULTURE AND SOCIAL JUSTICE. (4 Credits)
Exposes graduate students to the methodological approaches and methods used in guiding empirical research on the socio-cultural aspects of food, focusing on vulnerable populations, food security, procurement, foodways, disasters, and climate change. Methodological approaches and methods as evidenced in peer-reviewed publications is the grounding for the course. CROSSLISTED as ANTH 547/FCSJ 547.
Equivalent to: ANTH 547

FCSJ 554. INTERNATIONAL PERSPECTIVES ON FOOD SYSTEMS. (4 Credits)
Macro and micro-comparative overview of food systems in at least two different international settings, highlighting the influences of culture, social structure, geography, and economy on food systems. Non-traditional and emerging theoretical critiques of such influences on food systems are highlighted.

FCSJ 564. FOOD AND ETHNIC IDENTITY: DECOLONIZING FOOD AND OUR BODY. (3 Credits)
This interdisciplinary and comparative course will examine the relationship between food and identity. Food, from its production to consumption, is a powerful symbol of social and cultural meaning. As an expression of identity and subjectivity, food also marks borders between humans and non-humans, plants and animals, nature and culture, tradition and modernity, etc. CROSSLISTED as ES 464/FCSJ 464 and ES 564/FCSJ 564.
Equivalent to: ES 564

FCSJ 567. AGRI-FOOD MOVEMENTS. (4 Credits)
Investigates the origins and contemporary status of producer and consumer food movements including, but not limited to, organic, agricultural labor movements, animal welfare, vegetarian and vegan movements, farmers' markets, and permaculture. CROSSLISTED as ANTH 567/FCSJ 567.
Equivalent to: ANTH 567

FCSJ 586. ANTHROPOLOGY OF FOOD. (4 Credits)
The role of food in human cultures, both past and present. Includes discussion of different food procurement styles, social movements and the political economy of food. Looks at the symbolic aspects of food as well as its relationship with the environment. CROSSLISTED as ANTH 486/FCSJ 486 and ANTH 586/FCSJ 586.
Equivalent to: ANTH 586
Recommended: 3 credits of social science.

FCSJ 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

**Food Science and Technology (FST)**

FST 101. FOOD SCIENCE ORIENTATION. (1 Credit)
For food science majors. Orientation and academic guidance toward career planning in food science and technology.

FST 199. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

FST 210. FRUIT AND VEGETABLE PROCESSING. (3 Credits)
Lectures, lab activities and plant tours to help majors and non-majors understand traditional and modern fruit and vegetable processing technologies.
Recommended: CH 123 or CH 223 or ((CH 233 or CH 233H) and (CH 263 or CH 263H))

FST 212. DAIRY PROCESSING. (2 Credits)
Methods of processing and preserving milk and milk products and related unit operations.
Recommended: CH 123 or CH 223 or CH 233 or CH 233H

FST 213. DAIRY PROCESSING LABORATORY. (1 Credit)
Laboratory and field work to accompany FST 212. Field trip required.
Recommended: Concurrent enrollment in FST 212

FST 251. INTRODUCTION TO WINES, BEERS, AND SPIRITS. (3 Credits)
A descriptive introduction to the history, science, sensory, economics, and societal aspects of alcoholic beverages.
Recommended: High school biology and chemistry

FST 260. *FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE. (3 Credits)
Exploring the sciences and technologies of food processing and preservation within the context of their historical, current, and possible future influences on what we eat, the structure of our society, and our day-to-day lives. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

FST 273. *WINE IN THE WESTERN WORLD. (3 Credits)
A study of wine throughout history, from its accidental discovery and refinement through today, with a focus on the profound role wine plays in agriculture, social rituals, human health, economics, and the ambivalent pursuit of pleasure. (Baccalaureate Core Course)
Attributes: CPWC – Core, Pers, West Culture

FST 315. PILOT PLANT EXPERIENCES. (2 Credits)
Students will be working in one of the FST pilot plants (dairy, vegetables/fruit, brewing, wine making, distilling) and will be assisting with the manufacturing of foods or beverages. Students must have available blocks of time in their schedules to contribute significantly to a production run. Production schedules for each pilot plant will be determined in advance of registration for each term. Not all pilot plants will be available each term. Lab.

FST 360. FOOD SAFETY AND SANITATION. (3 Credits)
Principles, practices, and regulations governing and ensuring the microbiological safety of our food supply through risk assessment, surveillance, and intervention.
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better or BI 212 with D- or better or BI 212H with D- or better or BI 213 with D- or better or BI 213H with D- or better) and (CH 121 [D-] or CH 221 [D-] or CH 221H [D-] or CH 231 [D-] or CH 231H [D-])

FST 370. INDUSTRY PREPARATION/HACCP. (3 Credits)
Assists students in preparation for internships and employment in the food industry by introducing compliance with food safety regulations, HACCP, and audits.
Recommended: One year of chemistry and one year of biology.

FST 385. *COMMUNICATING FOOD AND FERMENTATION SCIENCE. (3 Credits)
This writing intensive course (WIC) will guide students in the investigation and critical evaluation of literature on a topic of current interest in food or fermentation science, and the development of their ability to write concisely and with precision about technical subject matter in this discipline. Lec/rec. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WR 121 with C- or better and FST 360 [D-] and MB 302 (may be taken concurrently) [D-]
Recommended: Completion of Bacc Core Writing II requirement
FST 399. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: FST 399H
This course is repeatable for 16 credits.

FST 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: FST 399
This course is repeatable for 16 credits.

FST 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FST 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FST 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FST 407. SENIOR SEMINAR. (1 Credit)

FST 410. INTERNSHIP. (1-16 Credits)
A work internship to give students practical on-the-job training in the food processing or related industries. Graded P/N.
This course is repeatable for 16 credits.

FST 420. SENSORY EVALUATION OF FOOD. (4 Credits)
Sensory test methods used in the evaluation of the taste, smell, texture, and color of foods as well as the evaluation of consumer acceptance of foods. This includes methods for measuring sensory qualities, underlying psychological principles, statistical methods for analyzing data, and proper interpretation of these results. Lec/lab.
Prerequisites: (ST 351 with C- or better or ST 411 with C- or better) and (ST 352 (may be taken concurrently) [D-] or ST 412 (may be taken concurrently) [D-])

FST 421. *FOOD LAW. (3 Credits)
Concepts, statutes, regulations, and agencies controlling the production, processing, and distribution of food. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

FST 422. FOOD CHEMISTRY FUNDAMENTALS. (4 Credits)
An integrated lecture/lab/recitation course applying theories of molecular reactivity to model food systems. Lectures focus on the molecular bases of chemical phenomena that dictate the behavior of foods. Laboratories and recitations provide opportunities for students to observe, manipulate, and explore model food systems. Emphasis on major food components (water, proteins, carbohydrates, lipids, and food polymers) and their behavior under conditions of particular relevance to food processing. Lec/lab/rec.
Prerequisites: (BB 350 with D- or better or BB 450 with D- or better or BB 450H with D- or better) and (CH 332 [C-] or CH 336 [C-]) and (MTH 228 (may be taken concurrently) [D-] or MTH 252 (may be taken concurrently) [D-] or MTH 252H (may be taken concurrently) [D-])

FST 423. FOOD ANALYSIS. (4 Credits)
An integrated laboratory/lecture course covering methods used for the quantitative analysis of the chemical composition of foods and agricultural products.
Recommended: CH 324 and CH 337 and BB 350

FST 425. FOOD SYSTEMS CHEMISTRY. (4 Credits)
The chemistry of food components in real-world food systems. Focused on water, proteins, carbohydrates, lipids, and food polymers, their interactions, and the effects of food processing and storage. Integrates writing as a learning tool and means of professional communication. Lec/lab/rec.
Prerequisites: FST 422 with D- or better

FST 430. INNOVATION AND FOOD PRODUCT DEVELOPMENT. (4 Credits)
Provides technical background and hand-on laboratory experience in food product development and food innovation. Lec/lab.
Prerequisites: CH 331 with D- or better and CH 332 [D-] and FST 360 [D-] and FST 421 [D-] and FST 422 [D-]

FST 437. CHEMISTRY AND BIOCHEMISTRY OF DISTILLED SPIRITS. (3 Credits)
The underlying science of the production of the distilled spirits will be discussed systematically. The course will cover the requirements for water, the major raw materials (eg. cereals, fruits, agave, syrups, and woods for maturation) and the conversion of these into fermentable extract. The scientific principles of fermentation will be explored, in the context of both ethanol and secondary metabolite production. Distillation will be considered, in terms of the physics and chemistry of liquid-liquid separations, before discussing post-fermentation options such as blending, maturation and product finishing.
Prerequisites: FST 251 with C- or better and BB 350 (may be taken concurrently) [D-]

FST 438. PRODUCTION AND ANALYSIS OF DISTILLED SPIRITS. (3 Credits)
Building on the prerequisite course, this course compares and contrasts different approaches to the manufacture of distilled spirits by using some of the major spirit categories as examples. The management of a distilled spirits production plant in terms of legislative, safety and process/ product quality will be discussed before explicit consideration of the requirements for establishing a distilled spirits production plant.
Successful completion of this course will provide students with a broad understanding of the distilled spirits sector.
Prerequisites: FST 437 with D- or better
This course is repeatable for 3 credits.

FST 460. BREWING SCIENCE. (3 Credits)
Chemistry, microbiology and engineering of malting and brewing operations for the production of beer, including the compositional analysis of barley, malt, hops, water, and beer and their effects on beer quality.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-]
Recommended: Completion or concurrent enrollment in BEE 472 and MB 302

FST 461. BREWING ANALYSIS. (3 Credits)
Compositional analysis, laboratory techniques and sensory evaluation of barley, malt, hops, water, yeast and beer. Lec/lab.
Prerequisites: FST 460 with D- or better and (MB 303 [D-] or MB 303H [D-])

FST 466. WINES PRODUCTION PRINCIPLES. (3 Credits)
Principles of wine production technology from grape berry development through bottling, covering the microbiology and chemistry of fermentation, aging and production practices of red and white table wines, as well as sparkling and dessert wines.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-]
Recommended: BB 350 and MB 302

FST 467. WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION. (5 Credits)
An integrated lecture/lab course that focuses on the practical fundamentals of red and white wine production. Students will make wine and monitor its progression from the grape to the bottle using standard chemical, microbial, and sensorial techniques.
Prerequisites: FST 466 with D- or better and FST 479 (may be taken concurrently) [D-]
FST 479. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSLISTED as FST 479/MB 479 and FST 579/MB 579.
**Prerequisites:** (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-] and (BB 350 [D-] or BB 450 [D-]) and MB 302 [D-]
**Equivalent to:** MB 479

FST 480. TOPICS IN FERMENTATION. (0-2 Credits)
Selected topics in fermentation science will be presented by department faculty and invited outside experts. Topics and format will change each quarter. Students may take the course for 1 or 2 credits as the topics change. Lec/lab. This course is repeatable for 8 credits.

FST 490. FOOD PROCESSING CALCULATIONS. (2 Credits)
Application of engineering principles to produce safe processed foods meeting consumer expectations for safety and quality. Validate process engineering models by comparing predicted values with new experimental data.
**Prerequisites:** BEE 472 with D- or better and FST 360 [D-]
**Corequisites:** FST 491

FST 491. FOOD PROCESSING CALCULATIONS LABORATORY. (1 Credit)
Experiments in a pilot plant supported by a computer laboratory. Prepare samples of novel process technology products.
**Corequisites:** FST 490
**Recommended:** Microsoft Excel skills.

FST 495. FOOD PACKAGING. (2 Credits)
Fundamentals of food packaging covering the major packaging solutions with a focus on plastic, paper, and paperboard.

FST 499. SPECIAL STUDIES. (0-16 Credits)
This course is repeatable for 16 credits.

FST 501. RESEARCH. (1-16 Credits)
PREREQ: Departmental approval required. This course is repeatable for 16 credits.

FST 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FST 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FST 507. SEMINAR. (1 Credit)
This course is repeatable for 4 credits.

FST 509. PRACTICUM IN TEACHING. (1-16 Credits)
This course is repeatable for 16 credits.

FST 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

FST 514. HEALTH BENEFITS OF FUNCTIONAL FOODS, NUTRACEUTICALS AND DIETARY SUPPLEMENTS. (3 Credits)
Functional foods, nutraceuticals and dietary supplements represent a rapidly expanding segment of domestic and international markets. This course will overview the principles and procedures necessary to evaluate and market these products. The chemistry and mechanisms of major nutraceutical ingredient categories and current scientific information supporting their biochemical and physiological efficacy will be addressed. Special dietary products, such as medical, weight control, sport, and herbal supplements, will be addressed. Regulatory aspects of labeling and structure-function claims will be covered. CROSSLISTED as FST 514/NUTR 514.
**Equivalent to:** NFM 514, NUTR 514
**Recommended:** BB 350 and CH 332

FST 520. SENSORY EVALUATION OF FOOD. (4 Credits)
Sensory test methods used in the evaluation of the taste, smell, texture, and color of foods as well as the evaluation of consumer acceptance of foods. This includes methods for measuring sensory qualities, underlying psychological principles, statistical methods for analyzing data, and proper interpretation of these results. Lec/lab.
**Recommended:** Completion of ST 351 or ST 411 and completion or concurrent enrollment in ST 352 or ST 412

FST 521. FOOD LAW. (3 Credits)
Concepts, statutes, regulations, and agencies controlling the production, processing, and distribution and promotion of food.

FST 522. FOOD CHEMISTRY FUNDAMENTALS. (4 Credits)
An integrated laboratory/lecture course applying theories of molecular reactivity to model food systems. Lectures focus on the molecular bases of chemical phenomena that dictate the behavior of foods. Laboratories and recitations provide opportunities for students to observe, manipulate, and explore model food systems. Emphasis on major food components (water, lipids, proteins, and carbohydrates) and their behavior under conditions of particular relevance to food processing. Lec/lab/rec.
**Recommended:** Completion of ST 351 or ST 352 and BB 350 or BB 450 or BB 450H and (CH 332 or CH 336) and (MTH 228 or MTH 252 or MTH 252H)

FST 523. FOOD ANALYSIS. (4 Credits)
An integrated laboratory/lecture course covering methods used for the quantitative analysis of the chemical composition of foods and agricultural products.
**Recommended:** CH 324 and CH 337 and BB 350

FST 525. FOOD SYSTEMS CHEMISTRY. (4 Credits)
The chemistry of food components in real-world food systems. Focused on water, proteins, carbohydrates, lipids, and food polymers, their interactions, and the effects of food processing and storage. Integrates writing as a learning tool and means of professional communication. Lec/lab/rec.
**Prerequisites:** FST 522 with C or better

FST 537. CHEMISTRY AND BIOCHEMISTRY OF DISTILLED SPIRITS. (3 Credits)
The underlying science of the production of the distilled spirits will be discussed systematically. The course will cover the requirements for water, the major raw materials (eg. cereals, fruits, agave, syrups, and woods for maturation) and the conversion of these into fermentable extract. The scientific principles of fermentation will be explored, in the context of both ethanol and secondary metabolite production. Distillation will be considered, in terms of the physics and chemistry of liquid-liquid separations, before discussing post-fermentation options such as blending, maturation and product finishing.
FST 538. PRODUCTION AND ANALYSIS OF DISTILLED SPIRITS. (3 Credits)
Building on the prerequisite course, this course compares and contrasts different approaches to the manufacture of distilled spirits by using some of the major spirit categories as examples. The management of a distilled spirits production plant in terms of legislative, safety and process/product quality will be discussed before explicit consideration of the requirements for establishing a distilled spirits production plant. Successful completion of this course will provide students with a broad understanding of the distilled spirits sector.
Prerequisites: FST 537 with D- or better
This course is repeatable for 3 credits.

FST 560. BREWING SCIENCE. (3 Credits)
Chemistry, microbiology and engineering of malting and brewing operations for the production of beer, including the compositional analysis of barley, malt, hops, water, and beer and their effects on beer quality.
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and completion or concurrent enrollment in BEE 472 and MB 302

FST 561. BREWING ANALYSIS. (3 Credits)
Compositional analysis, laboratory techniques and sensory evaluation of barley, malt, hops, water, yeast and beer. Lec/lab.
Recommended: FST 460 and (MB 303 or MB 303H)

FST 566. WINE PRODUCTION PRINCIPLES. (3 Credits)
Principles of wine production technology from grape berry development through bottling, covering the microbiology and chemistry of fermentation, aging and production practices of red and white table wines, as well as sparkling and dessert wines.
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and BB 350 and MB 302

FST 567. WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION. (5 Credits)
An integrated lecture/lab course that focuses on the practical fundamentals of red and white wine production. Students will make wine and monitor its progression from the grape to the bottle using standard chemical, microbial, and sensory techniques.
Prerequisites: FST 566 with C or better
Corequisites: FST 579

FST 579. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSTLISTED as FST 479/MB 479 and FST 579/MB 579.
Equivalent to: MB 579
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and (BB 350 or BB 450) and MB 302

FST 595. FOOD PACKAGING. (2 Credits)
Fundamentals of food packaging covering the major packaging solutions with a focus on plastic, paper, and cardboard.
Recommended: Junior standing in a physical or biological science-based major.

FST 599. SPECIAL STUDIES. (0-16 Credits)
This course is repeatable for 16 credits.

FST 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FST 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FST 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FST 607. SEMINAR. (1 Credit)
This course is repeatable for 4 credits.

FST 620. ADVANCED TOPICS IN SENSORY SCIENCE. (2 Credits)
Current and/or advanced subjects in human sensory science. Includes 1) topics in human flavor perception that covers human psychophysics, neuroscience, and related fields, and 2) sensory evaluation techniques and data handling methods that are advanced in nature. Different points of view regarding above topics will be discussed.
Prerequisites: FST 520 with C or better
This course is repeatable for 4 credits.

FST 628. FLAVOR CHEMISTRY. (3 Credits)
The definition of flavor, analytical methods in flavor chemistry, and mechanisms of odor interaction in food system will be discussed. In addition, an integrated approach will be used to study the flavor chemistry of economically-important agricultural products in the Pacific Northwest such as dairy products, fruits, and alcoholic beverages.
Recommended: FST 522 and FST 523

FST 639. FOOD POLYMER SCIENCE. (3 Credits)
Investigates the theoretical principles and structure-function relationships of food macromolecules. The theoretical principles are related, where possible, to observable phenomena during thermal processing and storage of foods.
Recommended: (FST 422 or FST 522) and (FST 425 or FST 525)

FST 641. PROCESSING WHEAT AND OTHER SMALL GRAINS: A MOLECULAR VIEW. (3 Credits)
Provides a fundamental overview of wheat and other cereals from the perspective of the molecular level events that are important in milling, baking, and other processes. Uses cereal processing (focused primarily on bread-making) as the vehicle for placing elements of food chemistry, food polymer science, physical chemistry, and rheology into the cohesive framework of a single food category. Students will experience how the sciences of chemistry, physics, engineering, microbiology/biochemistry, nutrition, etc. amalgamate in the production of the selected cereal products. Lec/lab.

FST 666. ADVANCED TOPICS IN ENOLOGY. (3 Credits)
An in-depth investigation of advanced wine processing techniques and wine research, focusing on their impact on production and wine quality.
Prerequisites: FST 566 with B or better and FST 567 (may be taken concurrently) [B]
Recommended: Viticulture course such as HORT 454 and good understanding of how vineyard practices influence grape quality.

Forest Ecosystems and Society (FES)

FES 115. ECOLOGY OF OREGON COAST FOREST. (1 Credit)
A combination of lecture, lab, and field exercises to explore the ecology and development of Oregon coastal forests. Lec/lab. Graded P/N.
Equivalent to: FS 115

FES 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: FS 199
This course is repeatable for 16 credits.
FES 202. SOFTWARE TOOLS IN QUANTITATIVE SOCIAL SCIENCE RESEARCH. (3 Credits)
Develop and apply software skills to analyze quantitative social science data, then interpret and present results. Using software, students will conduct statistical analysis of primary and/or secondary data (for example, their own survey data or data from sources such as the US Census American Community Survey).
Prerequisites: ST 201 with C or better

FES 240. *FOREST BIOMASS. (4 Credits)
Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: FES 240H, FOR 240

FES 240H. *FOREST BIOMASS. (4 Credits)
Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator
Equivalent to: FES 240

FES 241. DENDROLOGY. (3 Credits)
Learn to identify the principal forest trees of North America, and the principal trees and shrubs of the Pacific Northwest. Also learn about forested regions of the world. Lec/lab/rec.
Equivalent to: FES 141

FES 242. FOREST PLANTS OF THE PACIFIC NORTHWEST. (3 Credits)
Field course on the identification and ecology of forest trees, shrubs, and herbs of the Pacific Northwest. Overnight camping required. Students should be prepared to hike 3-5 miles per day.
Equivalent to: FOR 242

FES 341. FOREST ECOLOGY. (3 Credits)
Basic physiological characteristics of trees, succession, climax, and related concepts. Vegetation classification. Stand structure, diversity, competition, growth, soils-forests interactions, biomass and nutrient distribution, energy relations, nutrient element dynamics, ecology of disturbances.
Equivalent to: FOR 341

FES 342. FOREST TYPES OF THE NORTHWEST. (3 Credits)
Forest trees in nature are aggregated into stable or transitory associations known as forest cover types. Knowledge of forest cover types, their species composition and ecology, is applicable to the fields of forestry, fire management, wildlife management, and forest ecology.
Equivalent to: FOR 342

FES 343. FORESTS OF THE EASTERN UNITED STATES. (3 Credits)
Major Southeast US forest types will be visited and morphological, geographic, ecological and economic characteristics of important forest tree species examined.
Prerequisites: FES 141 with C or better or FES 241 with C or better
This course is repeatable for 3 credits.

FES 350. URBAN FORESTRY. (3 Credits)
Introduction to principles and practices of planting and managing trees as a system of urban environment; understanding the economic, environmental, social aspects of urban forests, and an overview of contemporary land use issues and societal perspectives between people and plants. CROSSTLISTED as FES 350/HORT 350.
Equivalent to: FOR 350
Recommended: Foundational forestry and horticulture courses

FES 355. MANAGEMENT FOR MULTIPLE RESOURCE VALUES. (3 Credits)
Management of a variety of resource attributes in multiple use context, including considerations for recreation, fish, wildlife, aesthetics, watersheds, and forest products.
Equivalent to: FOR 355

FES 365. *ISSUES IN NATURAL RESOURCES CONSERVATION. (3 Credits)
Background of major current issues in natural resources conservation with emphasis on forests, soils, and water and potential sustainable carrying capacity. Focus on evaluating facts and opinions related to issues. Basics of terrestrial and aquatic ecology, recent and current issues of soil, water, and forest use and management. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FOR 365

FES 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

FES 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FS 401
This course is repeatable for 16 credits.

FES 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FES 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FES 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FES 407. SEMINAR. (1-16 Credits)
Some sections graded A-F. This course is repeatable for a maximum of 16 credits.
This course is repeatable for 16 credits.

FES 410. INTERNSHIP. (1-16 Credits)
Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. Graded P/N.
This course is repeatable for 16 credits.

FES 412. FOREST ENTOMOLOGY. (3 Credits)
Role of insects in natural and managed forests. Recognition of important forest insect pest groups and species, prediction of forest insect responses to environmental changes, and management strategies and treatments to protect forest resource values.
Prerequisites: BI 204 with C or better or BI 211 with C or better or BI 211H with C or better or BI 212 with C or better or BI 212H with C or better

FES 422. RESEARCH METHODS IN SOCIAL SCIENCE. (4 Credits)
An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results. Lec/lab.
Prerequisites: ST 201 with D- or better or ST 351 with D- or better or ST 351H with D- or better
Equivalent to: TOL 422

FES 430. FOREST AS CLASSROOM. (4 Credits)
Investigates instructional methods used to teach K-12 students about natural resources. Reveals how forest exploration can be used as a means to teach others about science, ecology, mathematics, social science, and history. Provides an opportunity for future teachers, naturalists, interpreters, and scientists to improve their teaching and communication skills.
FES 433. PLANNING AGROFORESTRY PROJECTS. (2 Credits)
Helps forestry and other natural resource students understand various agroforestry concepts, systems and technologies and practices worldwide. Lays the groundwork for students to identify different systems, characterize socio-economic conditions and plan sustainable agroforestry systems. Class activities examine how biological, economic, and social factors influence agroforestry farming decisions.
Prerequisites: BOT 341 with D- or better

FES 435. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FES 435H, TOX 435, TOX 435H
Recommended: One quarter each of biology and chemistry

FES 440. WILDFIRE FIRE ECOLOGY. (3 Credits)
Fire histories and ecology of major forest, rangeland, and wetland ecosystems. Includes fire interactions with physical and biotic components of ecosystems, role of fire in ecological processes, and utilization in natural resource management.
Equivalent to: FOR 446
Recommended: Junior or senior standing, with coursework in ecology and natural resource management

FES 444. ECOLOGICAL ASPECTS OF PARK MANAGEMENT. (3 Credits)
Ecological principles applied to the management of park recreation uses. The relationship between biological and physical science information and recreation management decisions is explored.
Equivalent to: TOL 444
Recommended: An ecology course and completion or concurrent enrollment in FES 251 or FOR 251

FES 445. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FOR 445, FW 445
Recommended: BI 370 or BI 370H

FES 447. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: FOR 447, HORT 447
Recommended: (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

FES 450X. LARGE CARNIVORES IN ECOLOGY. (1 Credit)
Exploration of interesting effects of large carnivores on other animals and the structure and function of ecosystems. Featured carnivores include gray wolves, grizzly bears, cougars, lions, and others. Investigation of the global conservation status and trends of large carnivores and their prey.

FES 452. BIODIVERSITY CONSERVATION IN MANAGED FORESTS. (3 Credits)
Designed for students in forestry, wildlife, fisheries and related fields. Introduces the concepts of, and approaches to, managing forest stands, landscapes and regions to achieve desired habitat conditions for indicator species and conservation of biological diversity. CROSSLISTED as FES 452/FW 452.
Equivalent to: FS 453, FW 452
Recommended: FES 240 or FES 341 or BI 370

FES 454. MANAGING AT THE WILDLAND-URBAN INTERFACE. (3 Credits)
Course targets fire-prone communities where resource professionals need to work cooperatively with local and federal agencies and citizens to gain acceptance for fire management programs and build joint responsibility for fuel reduction activities.
Equivalent to: FOR 454
Recommended: FOR 111 for non-Ecampus students

FES 455. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FOR 455, HORT 455
Recommended: FES 350 or HORT 350

FES 477. *AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/NR 477 and FES 577/RNG 577. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FS 477, NR 477
Recommended: Introductory course in biology.

FES 485. *CONSENSUS AND NATURAL RESOURCES. (3 Credits)
Students will use a working group approach. They will select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to their issue. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FS 485

FES 486. *PUBLIC LANDS POLICY AND MANAGEMENT. (3 Credits)
Examines public lands policy and management in the Western U.S. Overview of historical and current federal land management agency laws, regulations, and policies. Highlights political, legal, economic, ecological, and social context of public land management decisions. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: Sophomore standing

FES 499. SELECTED TOPICS IN FOREST SCIENCE. (0-16 Credits)
In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions, agroforestry, and others. This course is repeatable for 16 credits.
FES 500. MARKET TOOLS FOR MANAGING GREENHOUSE GAS EMISSIONS. (3 Credits)
Examines the use of market-based approaches to managing greenhouse gas emissions; the role of forestry and natural resource management in mitigating greenhouse gas emissions; and the design of carbon and offset markets in the context of broader climate change policies. CROSSLISTED as FES 500/MNR 500.
Equivalent to: MTH 111
Recommended: MTH 111

FES 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FS 501
This course is repeatable for 16 credits.

FES 503. THESIS. (1-16 Credits)
Equivalent to: FS 503
This course is repeatable for 999 credits.

FES 505. READING AND CONFERENCE. (1-16 Credits)
Some sections graded P/N.
Equivalent to: FS 505
This course is repeatable for 16 credits.

FES 506. PROJECTS. (1-16 Credits)
Equivalent to: FS 506
This course is repeatable for 16 credits.

FES 507. SEMINAR. (1-16 Credits)
Some sections graded A-F.
Equivalent to: FS 507
This course is repeatable for 16 credits.

FES 508. WORKSHOP. (1-16 Credits)
Equivalent to: FS 508
This course is repeatable for 16 credits.

FES 511. COMMUNITIES AND NATURAL RESOURCES. (5 Credits)
Provides students from diverse backgrounds with interdisciplinary, experiential learning exposure to contemporary community and natural resource issues in rural Oregon. Social science concepts are employed to critically appraise current conditions and future prospects for rural, natural resource-dependent communities.
Equivalent to: FS 511
This course is repeatable for 15 credits.

FES 512. FOREST ENTOMOLOGY. (3 Credits)
Role of insects in natural and managed forests. Recognition of important forest insect pest groups and species, prediction of forest insect responses to environmental changes, and management strategies and treatments to protect forest resource values.
Recommended: BI 204 or BI 211 or BI 211H or BI 212 or BI 212H or equivalent.

FES 520. POSING RESEARCH QUESTIONS. (3 Credits)
Acquaints beginning graduate students in the natural resources to the scientific method and formation of good researchable questions. The course consists of lectures, readings and discussions. Concepts in the course are reinforced and amplified by discipline-specific companion modules. Students prepare and orally present a researchable question in their area of interest that is critiqued by the class and instructors.
Equivalent to: FS 520

FES 521. NATURAL RESOURCE RESEARCH PLANNING. (3 Credits)
Research planning and study plan development, investigative procedures, the principles and ethics of natural resource science, principles and practices in scientific communication.
Equivalent to: FS 521

FES 522. RESEARCH METHODS SOCIAL SCIENCE. (4 Credits)
An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results. Lec/lab.
Equivalent to: FOR 522, MNR 522
Recommended: ST 201 or ST 351 or ST 351H plus graduate level statistics course

FES 523. QUANTITATIVE ANALYSIS IN SOCIAL SCIENCE. (4 Credits)
Application and interpretation of statistical approaches to human dimensions of natural resources, recreation, and other social sciences. Emphasis is on an applied approach focusing on understanding data, selecting appropriate statistics for theoretical and managerial problems, using statistical software for analyses, and interpreting findings.
Recommended: (FES 522 or FOR 522) and ST 511

FES 524. NATURAL RESOURCES DATA ANALYSIS. (4 Credits)
Hands-on experience in applied statistical modeling and data analysis for natural resources. Emphasis is on understanding of statistical models and the application and actual implementation of statistical analysis techniques, use of statistical software for analyses (e.g., R), and interpretation of findings. Students analyze data from their own research for final projects.
Prerequisites: ST 511 with B or better and ST 512 [B]

FES 525. INTERDISCIPLINARY APPROACHES TO SOCIO-ECOLOGICAL PROBLEMS. (3 Credits)
Inter-, multi- and transdisciplinary approaches to socio-ecological problems, including terminology, assumptions, and analytical frameworks of different scientific fields. How disciplines have been integrated to approach specific case studies. Teams apply concepts, tools, and approaches in a final integrated analysis, resulting in proposed actions or policies.

FES 526. EFFECTIVE COMMUNICATION & PRESENTATION SKILLS FOR SCIENTISTS. (1 Credit)
Provides an overview of communication principles and effective scientific communication skills for producing a seminar on proposed research presented to fellow scientists. Students evaluate strengths and weaknesses of communication styles; develop their ability to provide fair, timely feedback; and apply communication principles to evaluate strengths and weaknesses of presentations and proposed research.
This course is repeatable for 3 credits.

FES 527. FOREST CARBON ANALYSIS FOR ASSESSMENTS AND POLICY AGREEMENTS. (3 Credits)
Role of forests in mitigating greenhouse gas emissions. International GHG policies and recommendations for monitoring emissions and forest carbon. Measurement, modeling, and projections of forest ecosystem carbon. Evaluation of policies for reducing GHG emissions and increasing forest carbon stores.
Prerequisites: FES 536 with C or better
Recommended: MNR 538 or MNR 550

FES 530. FOREST AS CLASSROOM. (4 Credits)
Investigates instructional methods used to teach K-12 students about natural resources. Reveals how forest exploration can be used as a means to teach others about science, ecology, mathematics, social science, and history. Provides an opportunity for future teachers, naturalists, interpreters, and scientists to improve their teaching and communication skills.
FES 533. PLANNING AGROFORESTRY PROJECTS. (2 Credits)
Helps forestry and other natural resource students understand various agroforestry concepts, systems and technologies and practices worldwide. Lays the groundwork for students to identify different systems, characterize socio-economic conditions and plan sustainable agroforestry systems. Class activities examine how biological, economic, and social factors influence agroforestry farming decisions.
Recommended: BOT 341 and/or equivalent course in ecology.

FES 535. GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535.
Equivalent to: BI 535, FS 535, MCB 535, TOX 535
Recommended: One quarter each of biology and chemistry

FES 536. CARBON SEQUESTRATION IN FORESTS. (2 Credits)
Examines processes controlling the sequestration of carbon in the forest system including the forest itself and wood products. Also examines how forests can be managed to sequester carbon as well as the important economic, policy, and other constraints. Lectures, readings, discussion, simulation models, and home work will be used to cover the material.
Recommended: Undergraduate-level biology or ecology.

FES 537. BELOWGROUND ECOSYSTEMS. (3 Credits)
Physical and biological components and their interactions in different soil ecosystems with description and examination of the relationships between producers and decomposers in the soil.
Recommended: Undergraduate biology or ecology courses

FES 538. VALUATION OF NON-MARKET RESOURCES. (3 Credits)
Focuses on the theory and methods for estimating the economic value of non-market resources (e.g. clean air and water, biodiversity, nature-based recreation, etc.). Blends the theory and econometrics of non-market valuation through hands-on applications of methods with real datasets. The valuation of non-market resources is a burgeoning field within applied economics and should continue to grow in both importance and applications.
Recommended: AREC 512 or ECON 512

FES 540. WILDLAND FIRE ECOLOGY. (3 Credits)
Fire histories and ecology of major forest, rangeland, and wetland ecosystems. Includes fire interactions with physical and biotic components of ecosystems, role of fire in ecological processes, and utilization in natural resource management.
Recommended: Coursework in ecology and natural resource management

FES 542. WILDLIFE LANDSCAPE ECOLOGY. (3 Credits)
Explores the interaction between spatial pattern and scale and ecological processes with particular emphasis on biodiversity in forests. The focus is on theory, methods and conservation applications in landscape ecology.
Recommended: Undergraduate courses in ecology and concurrent enrollment in ST 511

FES 543. ADVANCED SILVICULTURE. (3 Credits)
The scientific basis of forest regeneration and silvicultural practices and prescriptions in immature and mature stands. Field trips are required. Lec/lab.
Equivalent to: FS 543
Recommended: FOR 442 and FOR 443

FES 545. ECOLOGICAL RESTORATION. (4 Credits)
Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FES 445/FW 445 and FES 545/FW 545.
Equivalent to: FOR 545, FW 545
Recommended: BI 370 or BI 370H

FES 546. ADVANCED FOREST COMMUNITY ECOLOGY. (4 Credits)
Fundamental concepts of community including disturbance, diversity and succession. Strong emphasis on field skills and data interpretation. Saturday field trip required. Lec/lab.

FES 547. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: HORT 547
Recommended: (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

FES 548. INVASIVE PLANTS: BIOLOGY, ECOLOGY AND MANAGEMENT. (3 Credits)
Concepts of plant physiology, genetics and population dynamics are used to understand how plant invasions occur and some communities continue to exist. Management implications are explored.
Equivalent to: FS 548

FES 550. TROPHIC CASCADES. (2-3 Credits)
Theory and empirical analysis of terrestrial carnivore effects on plants and ecosystems as mediated through herbivores. Emphasis on large carnivores, frequency/strength of trophic cascades, implications for ecosystem function, management, and restoration. Lectures, current literature, discussions, field exercise, term paper, and student presentations. CROSSLISTED as FES 550/FW 550.
Equivalent to: FOR 547, FW 547, FW 550
This course is repeatable for 3 credits.

FES 552. FOREST WILDLIFE HABITAT MANAGEMENT. (4 Credits)
Management of terrestrial vertebrates in forest ecosystems. Effects on silvicultural practices and landscape pattern on habitats and populations. CROSSLISTED as FES 552/FW 552.
Equivalent to: FW 552
Recommended: FOR 341 or equivalent course in ecology.

FES 554. MANAGING AT THE WILDLAND-URBAN INTERFACE. (3 Credits)
Course targets fire-prone communities where resource professionals need to work cooperatively with local and federal agencies and citizens to gain acceptance for fire management programs and build joint responsibility for fuel reduction activities.
Equivalent to: FOR 554
Recommended: FOR 111 for non-Ecampus students

FES 555. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FOR 555, HORT 555
Recommended: FES 350 or HORT 350
FES 558. CONCEPTS OF FOREST RECREATION PLANNING AND MANAGEMENT. (3 Credits)
Examines research that forms the conceptual basis for tools, techniques, and approaches used in recreation planning and management.
Equivalent to: FOR 558

FES 560. GREEN INFRASTRUCTURE. (4 Credits)
Explores the relationship between the natural and built environments in cities and examines how planning for and managing green infrastructure assets (such as urban tree canopy, watersheds, and natural areas) increases economic health, community livability and ecological resilience in cities.

FES 561. PHYSIOLOGY OF WOODY PLANTS. (3 Credits)
The structure, growth and physiological processes of trees and shrubs.
Equivalent to: FS 561
Recommended: (CH 231 or CH 231H) and (CH 232 or CH 232H) and (CH 233 or CH 233H) and CH 331 and CH 332 and BOT 331

FES 565. URBAN FORESTRY LEADERSHIP. (2 Credits)
Examines the application of leadership theories and principles to the decision-making, policy creation, and effective administration of urban forestry programs in the public, private, and non-profit sectors. Taught via Ecampus only.

FES 577. AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/NR 477 and FES 577/RNG 577.
Equivalent to: FS 577, NR 577, RNG 577
Recommended: Introductory course in biology.

FES 580. WRITING SCIENTIFIC MANUSCRIPTS. (1 Credit)
Discussion of parts of a scientific manuscript and the submission, review, and publication process. Brief presentations and discussion of examples provided by the instructor and students. Students write their own manuscripts and work in teams to provide feedback on manuscript components.

FES 585. CONSENSUS AND NATURAL RESOURCES. (3 Credits)
Students will use a working group approach. They will select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to their issue.
Equivalent to: FS 585

FES 586. PUBLIC LANDS POLICY AND MANAGEMENT. (3 Credits)
Examines public lands policy and management in the Western U.S. Overview of historical and current federal land management agency laws, regulations, and policies. Highlights political, legal, economic, ecological, and social context of public land management decisions.

FES 599. SELECTED TOPICS IN FOREST SCIENCE. (0-16 Credits)
In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions, agroforestry, and others.
This course is repeatable for 16 credits.

FES 600. GLOBAL CHANGE ECOLOGY: IMPACTS, MITIGATION, AND ADAPTATION. (3 Credits)
An interdisciplinary discourse on what is known about global change and dynamics of the earth system, including principles of climate, influences on ecosystem functioning and connectivity needed to understand responses of the earth system to human activities.
Equivalent to: FS 600

FES 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FS 601
This course is repeatable for 16 credits.

FES 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FES 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FS 605
This course is repeatable for 16 credits.

FES 606. PROJECTS. (1-16 Credits)
Equivalent to: FS 606
This course is repeatable for 16 credits.

FES 629. TEACHING PRACTICUM IN FOREST SCIENCE. (1 Credit)
Preparation of graduate students in forest science and related disciplines for their first teaching experiences. Using concepts and information introduced in the class, students will develop the curriculum for one credit of college-level instruction (or an equivalent approved by the instructor) in a topic of their choice.
Equivalent to: FS 629

FES 646. FOREST ECOSYSTEMS ANALYSIS AND APPLICATION. (4 Credits)
The structure and function of forests and associated streams in natural and managed landscapes; application of ecosystem analysis to policy management decisions; roles of models; scaling from individual processes to ecosystems, landscapes, and beyond. Required classroom discussions, field trip.
Equivalent to: FS 646
Recommended: College-level ecology/biology, chemistry, and math; familiarity with Excel.

FES 699. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Forest Engineering (FE)

FE 101. INTRODUCTION TO FOREST ENGINEERING. (2 Credits)
Introduction to the forest engineering discipline. Discussion of critical issues, available resources, career opportunities and professional opportunities. Overview of field instruments and analytical approaches.

FE 102. FOREST ENGINEERING PROBLEM SOLVING AND TECHNOLOGY. (3 Credits)
A technology applications course designed to introduce students to formulating and implementing computational solutions to engineering analysis and design problems in a digital environment. Students will learn to evaluate engineering problems, formulate one or more solution techniques or algorithms, and code the solution using spreadsheet and/or programming software. Professionalism in completing and presenting laboratory exercises is emphasized. Laboratory examples draw from a variety of engineering topics. This course may be substituted for CE 102, Civil Engineering I: Problem Solving and Technology.
Equivalent to: FE 215
Recommended: Calculus
FE 206. ENGINEERING FOREST BIKING TRAILS. (2 Credits)
Students will design trails that mitigate impact on the environment and other trail users, while still providing a fun experience for mountain bike riders. Topics include site classification, trail safety, water management, digital terrain models, and commercial road design software. This course will emphasize field and design work.

FE 208. FOREST SURVEYING. (4 Credits)
Introduction to theory and practice of surveying methods and measurements as applied to the specifics of forestry problems and their solutions. This is the first of a four-course sequence (FE 208, 209, 310, 311). Together with FE 257 it is designed to prepare students for the Fundamentals of Land Surveying exam, which is necessary to become a professional land surveyor.
**Prerequisites:** MTH 112 with C or better or MTH 241 with C or better or MTH 251 with C or better or MTH 251H with C or better or MTH 252 with C or better or MTH 252H with C or better
**Equivalent to:** FE 308

FE 209. FOREST PHOTOGRAMMETRY AND REMOTE SENSING. (4 Credits)
Management and conservation of natural resources with the fundamentals of spatial data acquisition from airborne and spaceborne sensors. Introduction to theory of spectral reflectance properties of vegetation, the principles of photographic analysis and aerial photointerpretation and new advances such as LIDAR.
**Prerequisites:** MTH 112 with C or better or MTH 241 with C or better or MTH 251 with C or better or MTH 251H with C or better or MTH 252 with C or better or MTH 252H with C or better
**Equivalent to:** FE 309

FE 257. GIS AND FOREST ENGINEERING APPLICATIONS. (3 Credits)
An introduction to the appropriate use and potential applications of geographic information systems (GIS) and related technologies (GPS and remote sensing) in forest management and operational planning and problem solving. Students are presented with lectures and exercises that cover a wide range of GIS and GIS-related topics and issues including spatial database creation, structure, analysis, and modeling. Lec/lab.
**Equivalent to:** FE 357

FE 307. JUNIOR SEMINAR. (1 Credit)
College is the time to develop the skills necessary for the transition between academics and career. In conjunction with the expertise available on campus, this course will guide students through career planning, exploration, placement, and employer expectations. CROSSLISTED as FE 307/FOR 307.
**Equivalent to:** FOR 307

FE 310. FOREST ROUTE SURVEYING. (4 Credits)
Route surveying and site surveying applied to forestry problems. Use of surveying equipment; traversing; computations; leveling; horizontal, vertical, compound, reverse and spiral curves; earthwork; construction staking as applied to new road and existing road P-line survey. Includes rapid survey techniques. Lec/lab.
**Prerequisites:** (FE 208 with C or better or FE 308 with C or better) or CE 361 with C or better or CEM 263 with C or better

FE 312. FORESTRY FIELD SCHOOL. (2 Credits)
A hands-on experience in the major aspects of forestry, including regeneration surveys, silviculture, cruising, recreation, forest disturbances, logging site and mill visits, east and west of the Cascades Range. CROSSLISTED as FE 312/FOR 312.
**Equivalent to:** FOR 312

FE 315. SOIL ENGINEERING. (4 Credits)
**Prerequisites:** ENGR 213 (may be taken concurrently) with D- or better
**Recommended:** CE 311 or CEM 311 or FE 330

FE 316. SOIL MECHANICS. (4 Credits)
Soil strength and soil mechanics theories applied to analysis of slope stability, retaining structures, foundations, and pavements. Lec/lab.
**Prerequisites:** FE 315 (may be taken concurrently) with C- or better or CE 372 (may be taken concurrently) with D- or better

FE 330. FOREST ENGINEERING FLUID MECHANICS AND HYDRAULICS. (3 Credits)
Fluid properties, pressure, fluid statics, continuity, energy equation, single and series pipe flow, open channel hydraulics, peakflow estimates for culvert design, stream crossing design. Lec/lab.
**Prerequisites:** ENGR 213 (may be taken concurrently) with D- or better and FE 102 (may be taken concurrently)
**[C-]**
**Equivalent to:** FE 431

FE 370. HARVESTING OPERATIONS. (4 Credits)
Timber harvesting and transport methods from the forest to the mill. Technical feasibility, economic, and environmental relationships in forestry operations. Junior standing in forestry required. For non-forest engineering students.
**Prerequisites:** PH 201 with C or better or PH 211 with C or better

FE 371. HARVESTING PROCESS ENGINEERING. (4 Credits)
Timber harvesting equipment and systems. Harvesting process evaluation and decisions aided by forest engineering analysis. Lec/lab.
**Prerequisites:** ENGR 211 with C or better and FE 102 [C]
**Recommended:** Concurrent enrollment in FE 208 and FE 357

FE 403. THESIS. (1-16 Credits)
**PREREQ:** Departmental approval required.
This course is repeatable for 16 credits.

FE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FE 415. FOREST ROAD ENGINEERING. (3 Credits)
Location, surveying, design, cost estimation, and construction practices for forest roads. Lecture on principles, and laboratory field practice in forest road systems, road maintenance cycles and management.
**Prerequisites:** Fe 310 with C- or better

FE 416. FOREST ROAD SYSTEM MANAGEMENT. (4 Credits)
Structural characteristics of bridges, load rating, structural design of culverts, aggregate testing and evaluation, environmental assessment of forest road systems, road maintenance cycles and management.
**Prerequisites:** (ENGR 211 with D- or better or ENGR 211H with D- or better) and (ENGR 213 [D-] or ENGR 213H [D-]) and FE 316 [C-] and FE 415 [C-]
FE 423. U N MANNED AIRCRAFT SYSTEM REMOTE SENSING. (3 Credits)
Unmanned Aircraft System (UAS) Geomatics presents techniques in UAS design and applications for remote sensing measurements of both natural and constructed landscapes.
Prerequisites: FE 309 with C or better or GEOG 480 with C or better or GEOG 481 with C or better or GEO 444 with C or better or GEO 466 with C or better

FE 430. WATERSHED PROCESSES. (4 Credits)
Effects of land use practices on the physical hydrology (interception, infiltration, evapotranspiration, subsurface flow and surface runoff, water yields, and peak flows) of forested watersheds. Surface erosion, mass soil movements, stream temperatures, nutrient levels and effects of management activities upon riparian systems; forest practice rules. Lec/lab.

FE 431. ESSENTIALS OF FOREST ECOLOGY. (3 Credits)
An introduction to the biological, physical, and sociological factors that shape the world’s forests and the activities used to manage those forests. What influence these factors have on forest policies, practices, and outcomes. CROSSTLISTED as FE 456/FOR 456. (Bacc Core Course)
Attributes: CWIC – Core, Skills, WIC

FE 434. FOREST WATERSHED MANAGEMENT. (4 Credits)
Physical hydrology, erosion processes, streams, and riparian areas of forested ecosystems. The material can be widely applied, but is applicable primarily to the humid, temperate rainforests of the Pacific Northwest.
Prerequisites: CH 121 with C or better or CH 201 with C or better or CH 231 with C or better and (SOIL 205 [C] or CSS 305 [C] or CSS 205 [C]) and (MTH 241 [C] or MTH 251 [C] or MTH 251H [C])

FE 436. FOREST DISTURBANCE HYDROLOGY. (3 Credits)
Impacts of forest disturbance, including timber harvest, wildfire, insect outbreaks, and low frequency storms and floods on watershed hydrology and streams.
Prerequisites: FE 434 with C or better
Equivalent to: FE 435

FE 440. FOREST OPERATIONS ANALYSIS. (4 Credits)
Identification and measurement of production components in harvesting systems. Methods analysis, productivity improvement and engineering economics. Report writing skills emphasized. Lec/lab.
Prerequisites: FE 102 with C- or better and (FE 370 [C] or FE 371 [C])
Recommended: Basic statistics

FE 444. FOREST REMOTE SENSING AND PHOTOGRAMMETRY. (4 Credits)
Introduction to spectral reflectance, photogrammetry, image analysis, and point clouds. Fundamentals of data acquisition with passive and active sensors installed on airborne and spaceborne platforms. Radar and lidar in forestry. Lec/lab.
Prerequisites: FE 257 with C or better and (MTH 112 [C] or MTH 241 [C] or MTH 251 [C] or MTH 251H [C] or MTH 252 [C] or MTH 252H [C]) and (PH 201 [C] or PH 211 [C])

FE 456. INTERNATIONAL FORESTRY. (3 Credits)
An introduction to the biological, physical, and sociological factors that shape the world’s forests and the activities used to manage those forests. What influence these factors have on forest policies, practices, and outcomes. CROSSTLISTED as FE 456/FOR 456. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FOR 456
Recommended: Introductory course in biology.

FE 457. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSTLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Prerequisites: AREC 351 with C or better or FOR 330 with C or better
Equivalent to: FOR 457

FE 459. FOREST MANAGEMENT PLANNING AND DESIGN I. (4 Credits)
Integration of environmental, economic, and social aspects of forestry in management planning. Development of strategic and tactical plans using diverse data types and sources. Senior capstone class projects. Lec/lab. CROSSTLISTED as FE 459/FOR 459.
Prerequisites: FE 457 with C or better or FOR 457 with C or better
Equivalent to: FOR 459

FE 460. FOREST OPERATIONS REGULATIONS AND POLICY ISSUES. (3 Credits)
Reviews regulations and other policies that affect timber harvesting and other forest practices, particularly policies that address concerns of environment, safety, employment and transportation. Discusses how such rules and other policies evolve, including the role of public perceptions, forestry professionals and other key policy players. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

FE 469. FOREST MANAGEMENT PLANNING AND DESIGN II. (4 Credits)
A team-based, project-centric course for integrated timber harvest planning. Establish tactical and operational planning goals and constraints, identify feasible harvesting and transportation systems, and design harvest units to meet objectives and constraints. Lec/lab. CROSSTLISTED as FE 469/FOR 469.
Prerequisites: FE 459 with C or better or FOR 459 with C or better
Equivalent to: FOR 469

FE 470. LOGGING MECHANICS. (4 Credits)
Relationship of torque, power, and thrust to the operation of cable and ground-based harvesting systems. On-highway and off-highway heavy truck performance.
Prerequisites: (ENGR 211 with D- or better or ENGR 211H with D- or better) and ENGR 213 [D-] and FE 371 [C-]

FE 471. HARVESTING MANAGEMENT. (3 Credits)
Verification of harvesting assessment plans and operational planning/field layout. Practical logging skills related to harvest planning, operations monitoring, and designing worker training programs. Lec/lab.
Recommended: FE 371 and FE 470

FE 472. MECHANIZED HARVESTING AND SIMULATION. (2 Credits)
Study of harvesters, forwarders, and processing of timber for maximizing stand value. The use of a harvesting simulator will provide for a hands-on approach to learning.
Recommended: FOR 321

FE 479. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSTLISTED as CE 479/FE 479 and CE 579/FE 579.
Prerequisites: CE 373 with C or better or FE 316 with C or better
Equivalent to: CE 479

FE 480. FOREST ENGINEERING PRACTICE AND PROFESSIONALISM. (1 Credit)
Personal and professional skills, attributes, and issues in forest engineering practice. Includes topics such as ethics, land stewardship, media relations and risk management.

FE 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 8 credits.

FE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
FE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 507. SEMINAR. (1-16 Credits)
Subject matter as required by graduate programs.
This course is repeatable for 16 credits.

FE 515. FOREST ROAD ENGINEERING. (3 Credits)
Location, surveying, design, cost estimation, and construction practices for forest roads. Lecture on principles, and laboratory field practice in locating, surveying, designing, and cost estimating.
Recommended: Basic surveying

FE 516. FOREST ROAD SYSTEM MANAGEMENT. (4 Credits)
Structural characteristics of bridges, load rating, structural design of culverts, aggregate testing and evaluation, environmental assessment of forest road systems, road maintenance cycles and management.
Recommended: FE 415 or FE 515

FE 523. UNMANNED AIRCRAFT SYSTEM REMOTE SENSING. (3 Credits)
Unmanned Aircraft System (UAS) Geomatics presents techniques in UAS design and applications for remote sensing measurements of both natural and constructed landscapes.
Prerequisites: GEOG 580 with C or better or GEOG 581 with C or better or GEO 544 with C or better or GEO 566 with C or better or OC 678 with C or better

FE 530. WATERSHED PROCESSES. (4 Credits)
Effects of land use practices on the physical hydrology (interception, infiltration, evapotranspiration, subsurface flow and surface runoff, water yields, and peak flows) of forested watersheds. Surface erosion, mass soil movements, stream temperatures, nutrient levels and effects of management activities upon riparian systems; forest practice rules. Lec/lab.

FE 532. FOREST HYDROLOGY. (4 Credits)
Physical hydrology, erosion processes, and attributes of stream ecosystems for forested watersheds. Material can be widely applied, but is applicable primarily to the humid, temperate rainforests of the Pacific Northwest. Lec/rec.
Recommended: BEE 512 or introductory hydrology course

FE 536. FOREST DISTURBANCE HYDROLOGY. (3 Credits)
Impacts of forest disturbance, including timber harvest, wildfire, insect outbreaks, and low frequency storms and floods on watershed hydrology and streams.
Recommended: FE 434

FE 540. FOREST OPERATIONS ANALYSIS. (4 Credits)
Identification and measurement of production components in harvesting systems. Methods analysis, productivity improvement and engineering economics. Report writing skills emphasized. Lec/lab.
Recommended: FE 102 and (FE 370 or FE 371) and basic statistics.

FE 544. FOREST REMOTE SENSING AND PHOTOGRAMMETRY. (4 Credits)
Introduction to spectral reflectance, photogrammetry, image analysis, and point clouds. Fundamentals of data acquisition with passive and active sensors installed on airborne and spaceborne platforms. Radar and lidar in forestry. Lec/lab.
Recommended: FE 257 and (MTH 112 or MTH 241 or MTH 251 or MTH 251H or MTH 252 or MTH 252H)

FE 545. SEDIMENT TRANSPORT. (4 Credits)
Principles of sediment erosion, transportation and deposition in rivers, reservoirs, and estuaries; measurement, analysis, and computational techniques. Offered even years in winter term. CROSSLISTED as BEE 545/FE 545.
Equivalent to: BEE 545
Recommended: CE 313 or FE 330

FE 552. FOREST TRANSPORTATION SYSTEMS. (4 Credits)
Analysis of interactions between harvesting and road systems. Advanced topics in road and landing spacing, determination of road standards, analysis of logging road networks, transfer and sort yard facility location. Simultaneous resource scheduling and transportation planning.
Recommended: FE 102 and (FE 440 or FE 540)

FE 555. FOREST SUPPLY CHAIN MGMT. (3 Credits)
Develop and implement operational planning and logistics scheduling systems to manage a forestry supply chain for typical forest organizations in the Pacific Northwest. Once developed, these supply chain plans will be implemented using simulation software that will allow students to view the results of their forest operations plans.
Recommended: (CS 151 or FE 102) and FE 357 and FOR 457

FE 557. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Equivalent to: FOR 557
Recommended: AREC 351 or FOR 330

FE 560. FOREST OPERATIONS REGULATIONS AND POLICY ISSUES. (3 Credits)
Reviews regulations and other policies that affect timber harvesting and other forest practices, particularly policies that address concerns of environment, safety, employment and transportation. Discusses how such rules and other policies evolve, including the role of public perceptions, forestry professionals and other key policy players.

FE 570. LOGGING MECHANICS. (4 Credits)
Relationship of torque, power, and thrust to the operation of cable and ground-based harvesting systems. On-highway and off-highway heavy truck performance.
Recommended: ENGR 211 and ENGR 213 and FE 371

FE 571. HARVESTING MANAGEMENT. (3 Credits)
Verification of harvesting assessment plans and operational planning/field layout. Practical logging skills related to harvest planning, operations monitoring, and designing worker training programs.
Recommended: FE 371 and FE 470

FE 579. SLOPE AND EMBANKMENT DESIGN. (3 Credits)
A comprehensive overview of evaluating stability and performance for natural and engineered slopes. Design aspects include construction of road embankments, slope remediation techniques and application of geosynthetics for slope stabilization, slope and wall construction, and drainage. CROSSLISTED as CE 479/FE 479 and CE 579/FE 579.
Equivalent to: CE 579
Recommended: CE 373 or FE 316

FE 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

FE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
Forestry (FOR)

FOR 111. INTRODUCTION TO FORESTRY. (3 Credits)
Forest resources in the world; forests and human well-being; where and how forests grow; environmental and human values; products, characteristics, and uses; basic elements of use, planning and management. Interpretation of forestry literature; professional origins in the U.S. Field trips required.
Equivalent to: F 111

FOR 112. COMPUTING APPLICATIONS IN FORESTRY. (3 Credits)
An overview of computing applications used in all aspects of forestry work, but largely focused on development of intermediate and advanced spreadsheet skills using Microsoft Excel (e.g., complex formulas and functions, charting, and pivot tables). Additionally, the course rounds out essential skills in document formatting and presentation development.

FOR 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

FOR 206. *FOREST SOILS LABORATORY FOR SOIL 205. (1 Credit)
Laboratory exercise and field trips designed to develop student competency in soil processes, description, analysis, and assessment with a particular emphasis on the role of soils in managed and unmanaged forest ecosystems. (Bacc Core Course if taken with SOIL 205)
Attributes: CPBS – Core, Pers, Biological Science; CPPS – Core, Pers, Physical Science
Corequisites: SOIL 205

FOR 208. FOREST SOILS RECITATION. (1 Credit)
Readings, exercises, discussions designed to develop student competency in forest soil processes, description, analysis, and assessment. A particular emphasis will be placed on the role of soils in managed and unmanaged forest ecosystems.
Recommended: An introductory soils course.

FOR 307. JUNIOR SEMINAR. (1 Credit)
College is the time to develop the skills necessary for the transition between academics and career. In conjunction with the expertise already available on campus, this course will guide students through career planning, exploration, placement, and employer expectations. CROSSTLISTED as FE 307/FOR 307.
Equivalent to: FE 307

FOR 312. FORESTRY FIELD SCHOOL. (2 Credits)
A hands-on experience in the major aspects of forestry, including regeneration surveys, silviculture, cruising, recreation, forest disturbances, logging site and mill visits, east and west of the Cascades Range. CROSSTLISTED as FE 312/FOR 312.
Equivalent to: FE 312

FOR 321. FOREST MENSURATION. (5 Credits)
Theory and practice of sampling and cruising techniques; stratified and nonstratified sampling systems with fixed plots, variable plots, and 3-P designs.
Prerequisites: (FOR 141 with C or better or FES 141 with C or better or FOR 241 with C or better or FES 241 with C or better) and FE 208 [C] and FE 209 [C] and (MTH 241 [C] or MTH 245 [C] or MTH 251 [C] or MTH 251H [C] and (ST 201 [C] or ST 314 [C] or ST 314H [C] or ST 351 [C] or ST 351H [C])
Equivalent to: F 321

FOR 322. FOREST MODELS. (3 Credits)
Introduction to static and dynamic forest models: defining what they are, how they might be used, and, in general terms, how they are developed.
Prerequisites: FOR 321 with C- or better and MTH 241 [D-] and (ST 201 [D-] or ST 351 [D-])
Equivalent to: F 322

FOR 329. FOREST RESOURCE ECONOMICS I. (4 Credits)
Forest products markets, appraisal, rotation, thinning, uneven-aged management and forest regulation. Economics of timber management and harvest scheduling.
Prerequisites: ST 201 with D- or better or ST 351 with D- or better
Equivalent to: FOR 331

FOR 330. FOREST RESOURCE ECONOMICS II. (4 Credits)
Basic arithmetic of interest and capital budgeting. Basic wood products markets. Forest resource markets and market failures. Nonmarket valuation and multiple-use forestry. Impacts of forest management and policy decisions on forest resource use. Lec/lab.
Prerequisites: (AEC 250 with C or better or AREC 250 with C or better or ECON 201 with C or better or ECON 201H with C or better) and (MTH 241 [C] or MTH 245 [C] or MTH 251 [C] or MTH 251H [C] or MTH 252 [C] or MTH 252H [C])
Equivalent to: FOR 430

FOR 331. FOREST RESOURCE ECONOMICS III. (4 Credits)
Forest products markets, appraisal, rotation, thinning, uneven-aged management and forest regulation. Economics of timber management and harvest scheduling.
Prerequisites: ST 201 with C or better or ST 351 with C or better
Equivalent to: FOR 330

FOR 346. TOPICS IN WILDLAND FIRE. (3 Credits)
An interdisciplinary survey of concepts relating to fire science, ecology, management, and policy. Includes case studies of several representative ecosystems, ranging from west- and eastside forests of the Pacific Northwest to shrub steppe ecosystems of the Intermountain West and chaparral ecosystems of southern California. Distance and campus-based delivery using videos, website, and discussion.
Equivalent to: FW 346, RNG 346
Recommended: Coursework in forest biology or ecology (eg. FOR 240 or FES 240 or FES 341)

FOR 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

FOR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: FOR 399
This course is repeatable for 16 credits.
FOR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: F 401
This course is repeatable for 16 credits.

FOR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FOR 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: F 405, FRR 405
This course is repeatable for 16 credits.

FOR 406. PROJECTS. (1-16 Credits)
Section 4: Integrated Projects, Graded.
Equivalent to: F 406, RFR 406
This course is repeatable for 16 credits.

FOR 407. SEMINAR. (1-16 Credits)
Equivalent to: F 407, FRR 407
This course is repeatable for 16 credits.

FOR 408. WORKSHOP. (1-3 Credits)
Equivalent to: FRR 408
This course is repeatable for 16 credits.

FOR 410. INTERNSHIP. (1-16 Credits)
Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. Graded P/N.
Equivalent to: FRR 410
This course is repeatable for 16 credits.

FOR 413. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 413/FOR 413.
Prerequisites: BI 204 with C or better or BI 212 with C or better or BI 212H with C or better or BI 213 with C or better or BI 213H with C or better
Equivalent to: BOT 413

FOR 417. ADVANCED FOREST SOILS. (4 Credits)
Synthesize current information on fundamental properties and processes of forest soils with emphasis on applications to silviculture, soil conservation, and sustainable management of forested ecosystems. Lec/lab.
Prerequisites: SOIL 205 with C or better and ((ICH 231 with C or better or CH 231H with C or better) or (CH 261 [C] or CH 261H [C] or CH 201 [C]) and (MTH 241 [C] or MTH 251 [C] or MTH 251H [C] or MTH 252 [C] or MTH 252H [C]))
Equivalent to: FOR 417X

FOR 429. INTEGRATED PRESCRIPTIONS. (3 Credits)
Using an actual stand and real data, we will cultivate systematic approaches for: 1) characterizing site conditions and limiting factors; 2) harmonizing multiple management objectives; 3) modeling long-term responses to silvicultural manipulations; 4) assessing environmental impacts; 5) building public acceptance; and 6) communicating alternatives and rationales for decisions. This expanded course will allow a deeper project experience and more integration among the faculty in the co-requisite course, and providing the lab component of three other inter-related forest management courses.
Prerequisites: (FOR 240 with C or better or FES 240 with C or better) and FOR 321 [C]
Corequisites: FOR 443

FOR 431. ECONOMICS AND POLICY OF FOREST WILDLAND FIRE. (3 Credits)
General overview of the history of fire and the interaction of people with fire on forested landscapes. Forest fire policy history and current issues in the U.S. Basic legal concepts relevant to forest fire policy. An economic framework for understanding spatial externalities, decision-making under certainty, institutional economics, and incentives.
Prerequisites: AEC 351 with C or better or AEC 352 with C or better or FOR 330 with C or better or ECON 352 with C or better

FOR 436. WILDLAND FIRE SCIENCE AND MANAGEMENT. (4 Credits)
Principles and applications of fire as a natural resource management tool; the role of fire in conservation management, restoration, and preservation of ecosystems. Covers basic techniques and current research used to describe fire behavior and spread, fuels and fuel manipulation, and fire effects on the biota. Focus will be on fire as a natural process in ecosystem dynamics. Lec/lab.
Equivalent to: FW 436, RNG 436

FOR 441. SILVICULTURE PRINCIPLES. (4 Credits)
Silvicultural principles and practices needed to successfully regenerate foreststands in North America. Topics include artificial and natural regeneration, genetic improvement, seed orchards, forest tree nurseries, site preparation, seedling quality and handling, vegetation management, animal damage protection, early stand management, and ecological and ecophysiological considerations. Emphasis is placed on regeneration methods applied to plantations in western Oregon. Field trips required.
Prerequisites: SOIL 205 with C or better and (FES 240 [C] or FES 240H [C] or MTH 250 [C] or MTH 252 [C] or MTH 252H [C])
Corequisites: FOR 443

FOR 442. SILVICULTURE REFORESTATION. (4 Credits)
Silvicultural principles and practices needed to successfully regenerate forest stands in North America. Topics include artificial and natural regeneration, genetic improvement, seed orchards, forest tree nurseries, site preparation, seedling quality and handling, vegetation management, animal damage protection, early stand management, and ecological and ecophysiological considerations. Emphasis is placed on regeneration methods applied to plantations in western Oregon. Field trips required.
Prerequisites: SOIL 205 [C] or better and (FES 240H [C] or MTH 250 [C] or MTH 252 [C] or MTH 252H [C])
Corequisites: FOR 443

FOR 443. SILVICULTURAL PRACTICES. (4 Credits)
Principles and applications of fire as a natural resource management tool; the role of fire in conservation management, restoration, and preservation of ecosystems. Covers basic techniques and current research used to describe fire behavior and spread, fuels and fuel manipulation, and fire effects on the biota. Focus will be on fire as a natural process in ecosystem dynamics. Lec/lab.
Equivalent to: FW 436, RNG 436

FOR 456. INTERNATIONAL FORESTRY. (3 Credits)
An introduction to the biological, physical, and sociological factors that shape the world’s forests and the activities used to manage those forests. What influence these factors have on forest policies, practices, and outcomes. CROSSLISTED as FE 456/FOR 456. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FE 456
Recommended: Introductory course in biology.
FOR 457. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Prerequisites: AREC 351 with C or better or FOR 330 with C or better
Equivalent to: FE 457

FOR 459. FOREST MANAGEMENT PLANNING AND DESIGN I. (4 Credits)
Integration of environmental, economic, and social aspects of forestry in management planning. Development of strategic and tactical plans using diverse data types and sources. Senior capstone class projects. Lec/lab. CROSSLISTED as FE 459/FOR 459.
Prerequisites: FE 457 with C or better or FOR 457 with C or better
Equivalent to: FE 459

FOR 460. FOREST POLICY. (4 Credits)
Policy formulation and analysis for forest resources. Consideration of policy affecting land management approaches to planning, management, and social and economic development. Major forestry policy areas covered include outdoor recreation, range, timber, wilderness, and wildlife and fish. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

FOR 462. NATURAL RESOURCE POLICY AND LAW. (3 Credits)
First of two offerings designed to provide an introduction to current environmental and natural resource law issues and disputes for students who will have to meet, consult, and work with lawyers throughout their professional career. Focus is on mechanisms governing resource allocation within the constraints of private property rights. Emphasis is placed on the federal Endangered Species Act and its relation to water allocation within the constraints of private property rights. This course is repeatable for 16 credits.
Equivalent to: FOR 501

FOR 469. FOREST MANAGEMENT PLANNING AND DESIGN II. (4 Credits)
A team-based, project-centric course for integrated timber harvest planning. Establish tactical and operational planning goals and constraints, identify feasible harvesting and transportation systems, and design harvest units to meet objectives and constraints. Lec/lab. CROSSLISTED as FE 469/FOR 469.
Prerequisites: FE 459 with C or better or FOR 459 with C or better
Equivalent to: FE 469

FOR 499. SPECIAL TOPICS. (0-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. Section 8: Social aspects of natural resource management (3 credits) graded.
This course is repeatable for 16 credits.

FOR 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: F 501
This course is repeatable for 16 credits.

FOR 503. THESIS. (1-16 Credits)
Equivalent to: F 503
This course is repeatable for 999 credits.

FOR 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: F 505, FRR 505
This course is repeatable for 16 credits.

FOR 506. PROJECTS. (1-16 Credits)
Equivalent to: F 506
This course is repeatable for 16 credits.

FOR 507. SEMINAR. (1-16 Credits)
Equivalent to: F 507, FRR 507
This course is repeatable for 16 credits.

FOR 508. WORKSHOP. (1-3 Credits)
This course is repeatable for 16 credits.

FOR 510. INTERNSHIP. (1-9 Credits)
This course is repeatable for 16 credits.

FOR 513. FOREST PATHOLOGY. (3 Credits)
Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as BOT 513/FOR 513.
Equivalent to: BOT 513
Recommended: BI 204 or BI 212 or BI 212H or BI 213 or BI 213H

FOR 517. ADVANCED FOREST SOILS. (4 Credits)
Synthesize current information on fundamental properties and processes of forest soils with emphasis on applications to silviculture, soil conservation, and sustainable management of forested ecosystems. Lec/lab.
Recommended: SOIL 205 and (((CH 231 or CH 231H) and (CH 261 or CH 261H)) or CH 201) and (MTH 241 or MTH 251 or MTH 251H or MTH 252 or MTH 252H) all with a minimum grade of C-

FOR 518. MANAGING FOREST NUTRITION. (3 Credits)
Synthesize current information on nutrient limitations of forest productivity, long-term forest productivity, and mitigating and managing forest nutrition with emphasis on forests of the Pacific Northwest.

FOR 520. GEOSPATIAL DATA ANALYSIS WITH MATLAB. (3 Credits)
An introduction into analysis of spatial and other data using Matlab. The course will provide a practical introduction and is designed as a hands-on learning experience.
Equivalent to: F 520

FOR 524. FOREST BIOMETRICS. (3 Credits)
Advanced topics in forest biometrics, including measurement of forest structure and dynamics, application of sampling theory and methods, and statistical techniques for interpreting forestry data.
Equivalent to: F 524
Recommended: FOR 322 and ST 511

FOR 525. FOREST MODELING. (3 Credits)
Examination of regression techniques and assumptions used to develop static and dynamic equations of tree and stand attributes.
Prerequisites: ST 552 with C or better
Equivalent to: F 525

FOR 528. PROFESSIONAL COMMUNICATION AND ETHICS. (2 Credits)
Conventions of written and oral communication in forestry and related disciplines including basic narrative development. Exploration of environmental, professional, and research ethics, and the role they play in effective communication with multiple stakeholders.
FOR 531. ECONOMICS AND POLICY OF FOREST WILDLAND FIRE. (3 Credits)
General overview of the history of fire and the interaction of people with fire on forested landscapes. Forest fire policy history and current issues in the U.S. Basic legal concepts relevant to forest fire policy. An economic framework for understanding spatial externalities, decision-making under certainty, institutional economics, and incentives.
Recommended: FOR 330 or AEC 351 or AEC 352 or ECON 352

FOR 534. ECONOMICS OF THE FOREST RESOURCE. (3 Credits)
Topics include optimal stand and forest management for timber production, economics of ecosystem services (e.g. recreation, biodiversity, carbon sequestration, water quality and regulation), non-market valuation methods, management under risk and uncertainty, discounting, intergenerational equity, sustainability, international trade and other global issues.
Recommended: FOR 330 and FOR 331

FOR 536. WILDLAND FIRE SCIENCE AND MANAGEMENT. (4 Credits)
Principles and applications of fire as a natural resource management tool; the role of fire in conservation management, restoration, and preservation of ecosystems. Covers basic techniques and current research used to describe fire behavior and spread, fuels and fuel manipulation, and fire effects on the biota. Focus will be on fire as a natural process in ecosystem dynamics. Lec/lab.
Equivalent to: FW 536, RNG 536

FOR 542. INTERNATIONAL INTENSIVE SILVICULTURE. (2 Credits)
Operational and ecological aspects of intensive silvicultural management of planted forests around the world. Guest speakers in different countries will describe the type of silvicultural management that is carried out in the speaker's country from species and genetic selection, to harvest and rotation length, including site preparation and planting techniques. Emphasis on comparing silvicultural practices in each country to the management of plantations in western Oregon.

FOR 543. SILVICULTURAL PRACTICES. (5 Credits)
Manipulation of immature and mature forest stands for various resource management objectives. Principles and techniques involving vegetation control, thinning, fertilizing, and harvesting. Environmental considerations related to stand treatments. Two-day field trips required.
Recommended: (FOR 240 or FES 240) and FOR 321 and concurrent enrollment in FOR 429

FOR 549. SILVICULTURAL INFLUENCES ON FOREST ECOSYSTEM DYNAMICS. (3 Credits)
Fundamental biological and ecological principles for the design and implementation of silvicultural regimes that achieve a wide diversity of forest ecosystem management objectives.
Recommended: Undergraduate course in silviculture and in forest mensuration.

FOR 550. SUSTAINABLE FOREST MANAGEMENT. (3 Credits)
Sustainable forestry as part of the global sustainability movement. History of sustainability and its influence on decision-making in forest management. Current dimensions of sustainability: forest certification, climate change, role of environmental ethics, biodiversity conservation, maintenance of long-term site productivity, conservation of soil and water resources, roles of social institutions, and links to concerns for social justice.

FOR 557. TECHNIQUES FOR FOREST RESOURCE ANALYSIS. (4 Credits)
Use of linear programming, nonlinear programming, dynamic programming, and simulation to solve complex forest management problems, with emphasis on intertemporal multiple-use scheduling. Forestry transportation problems, multiple-use allocation, and investment analysis. Field trips required. CROSSLISTED as FE 457/FOR 457 and FE 557/FOR 557.
Equivalent to: FE 557
Recommended: AEC 351 or FOR 330

FOR 561. FOREST POLICY ANALYSIS. (3 Credits)
Basic elements of forest policy problems, including resource allocation and efficiency, distribution, and interpersonal equity, taxation, regulation, and control, and planning and uncertainty. Emphasis on policy and analysis and its uses in policy decision.

FOR 562. NATURAL RESOURCE POLICY AND LAW. (3 Credits)
First of two offerings designed to provide an introduction to current environmental and natural resource law issues and disputes for students who will have to meet, consult, and work with lawyers throughout their professional career. Focus is on mechanisms governing resource allocation within the constraints of private property rights. Emphasis is placed on the federal Endangered Species Act and its relation to water allocation and public trust doctrines. Students will also gain a broad understanding of regulatory .

FOR 563. ENVIRONMENTAL POLICY AND LAW INTERACTIONS. (3 Credits)
Second of two offerings designed to provide an introduction to current environmental and natural resource law issues and disputes for students who will have to meet, consult, and work with lawyers throughout their professional career. Focus is on the arena of regulatory environmental laws. Environmental torts, regulation of point and non-point source pollution under the federal Clean Water Act, wetlands protection, and laws governing agricultural and forest practices will be examined as examples of regulatory frameworks for achieving resource protection. Students will be exposed to the basic framework of federal laws regulating air and hazardous waste pollutants.

FOR 599. SPECIAL TOPICS. (1-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. Section 8: Social aspects of natural resource management (3 credits) graded.
This course is repeatable for 16 credits.

FOR 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: F 601
This course is repeatable for 16 credits.

FOR 603. THESIS. (1-16 Credits)
Equivalent to: F 603
This course is repeatable for 999 credits.

FOR 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: F 605
This course is repeatable for 16 credits.

FOR 606. PROJECTS. (1-16 Credits)
Equivalent to: F 606
This course is repeatable for 16 credits.

FOR 607. SEMINAR. (1-16 Credits)
Equivalent to: F 607
This course is repeatable for 16 credits.
FOR 699. SPECIAL TOPICS. (1-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. This course is repeatable for 16 credits.

FOR 808. WORKSHOP. (1-9 Credits)
This course is repeatable for 16 credits.

French (FR)

FR 111. FIRST-YEAR FRENCH. (4 Credits)
Prerequisites: FR 213. Lec/rec. or bilingual speakers of French will not receive credit for FR 211, FR 212, vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of French will not receive credit for FR 111, FR 112, FR 113. Lec/rec.

FR 112. FIRST-YEAR FRENCH. (4 Credits)
Prerequisites: FR 111 with D- or better or placement test

FR 113. FIRST-YEAR FRENCH. (4 Credits)
Prerequisites: FR 112 with D- or better or placement test

FR 121. SURVIVAL FRENCH FOR STUDENTS AND TRAVELERS. (3 Credits)
Provides practical linguistic tools for short stays in France. Basic conversation skills, pronunciation, introduction to French non-verbal language, as well as cultural tools, introduction to French etiquette, visual dictionary, and tips for avoiding cross-cultural misunderstandings common between Americans and the French.

FR 188. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society. This course is repeatable for 12 credits.

FR 199. SPECIAL STUDIES. (1-16 Credits)
Conversation, pronunciation, vocabulary-building, etc. Supplements basic sequence FR 111, FR 112, FR 113. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

FR 211. SECOND-YEAR FRENCH. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of French will not receive credit for FR 211, FR 212, FR 213. Lec/rec.
Prerequisites: FR 113 with D- or better or placement test

FR 212. SECOND-YEAR FRENCH. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of French will not receive credit for FR 211, FR 212, FR 213. Lec/rec.
Prerequisites: FR 211 with D- or better or placement test

FR 213. SECOND-YEAR FRENCH. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Completion of FR 213 with a grade of C- or better satisfies BA requirement in foreign languages. Native and/or bilingual speakers of French will not receive credit for FR 211, FR 212, FR 213. Lec/rec.
Prerequisites: FR 212 with D- or better or placement test

FR 288. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society. This course is repeatable for 12 credits.

FR 299. SPECIAL STUDIES. (1-16 Credits)
Conversation, pronunciation, vocabulary-building, etc. Supplements basic sequence FR 211, FR 212, FR 213. May not be offered every year. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

FR 300. ADVANCED FRENCH CONVERSATION. (3 Credits)
Focuses on oral communication through extensive listening and speaking practice in French. Students will interact with francophone cultures and the French language through personal research and presentations, exchanges with native and non-native francophone speakers, as well as through diverse authentic documents. Time will be dedicated to a targeted practice of French pronunciation, topical vocabulary and idiomatic expressions. Some reading and writing will also be required to develop oral skills. Native speakers of French are not eligible to take this course.
Prerequisites: FR 311 with C- or better

FR 311. THIRD-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French.
Prerequisites: FR 213 with C- or better or placement test

FR 312. THIRD-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French.
Prerequisites: FR 311 with C- or better or placement test

FR 313. THIRD-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; written assignments including original compositions. Conducted in French.
Prerequisites: FR 312 with C- or better or placement test

FR 315. FRENCH FOR BUSINESS. (3 Credits)
Recommended: FR 213

FR 319. SELECTED TOPICS IN FRENCH LANGUAGE. (3 Credits)
Skill-orientation variable. Conducted in French. May be repeated for credit when topic varies. This course is repeatable for 9 credits.
FR 321. FRENCH CONVERSATION FOR ADVANCED SPEAKERS I. (1 Credit)
Designed for students who would like to continue developing basic listening and speaking skills in French through independent work with a variety of media. Graded P/N.
Prerequisites: FR 213 with D- or better

FR 322. FRENCH CONVERSATION FOR ADVANCED SPEAKERS II. (1 Credit)
Designed for students who would like to continue developing basic listening and speaking skills in French through independent work with a variety of media.
Prerequisites: FR 213 with D- or better

FR 323. FRENCH CONVERSATION FOR ADVANCED SPEAKERS III. (1 Credit)
Designed for students who would like to continue developing basic listening and speaking skills in French through independent work with a variety of media.
Prerequisites: FR 213 with D- or better

FR 333. FRENCH CULTURE AND SOCIETY SINCE THE REVOLUTION. (3 Credits)
Cultural life of the French people from 1789 to the present. Conducted in French. Need not be taken in order. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts
Humanities Core
Recommended: Completion of 6 credits of 300-level French

FR 336. QUEBEC: TEXTS AND CONTEXTS. (3 Credits)
Intended for intermediate and advanced students in French. Offers an introductory knowledge of Quebec. Discussions and readings cover a variety of topics, including geography, history, cinema, literature, popular culture, the language issue, American and French influences, ethnic diversity and immigration, among other topics of interest.
Prerequisites: FR 211 with D- or better

FR 339. FRENCH: FRANCOPHONE STUDIES. (3 Credits)
May be repeated for credit when topic varies. Not offered every year.
Equivalent to: FR 339H
This course is repeatable for 9 credits.

FR 340. INTRODUCTION TO FRENCH LITERARY STUDIES. (3 Credits)
Concepts and vocabulary fundamental to the study of French literature; general view of the main currents of French literary history; introduction to French versification; techniques of literary analysis; practice in literary analysis and in writing about literature; explication de texte. Conducted in French. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: FR 213

FR 343. THE SHORT STORY: WOMEN IN THE FRANCOPHONE WORLD. (3 Credits)
A selection of short stories written by francophone women representing various regions of the French-speaking world. These stories revolve around contemporary issues affecting, and of interest particularly to women in these francophone societies. Among major themes will be immigration, conditions of women, quest for identity, tradition versus modernity, and other related topics.
Prerequisites: FR 311 with C or better

FR 349. SELECTED TOPICS IN FRANCOPHONE LITERATURE. (3 Credits)
Literary works, themes, movements, or authors from French-speaking areas of the world. Conducted in French. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.

FR 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students. Assignments as proctors or tutors in lower-division French courses. No more than 2 credits may be used to satisfy degree requirements for a major in French; may not be used to satisfy requirements for a minor in French. Graded P/N.
This course is repeatable for 6 credits.
Recommended: Completion of 12 upper-division credits in French, including FR 311, FR 312, FR 313 and FR 351, with a minimum 3.0 GPA

FR 388. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society.
This course is repeatable for 12 credits.

FR 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

FR 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FR 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

FR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

FR 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FR 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FR 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

FR 411. FOURTH-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; analysis of writing styles and techniques; oral reports and original presentations in French; original compositions. Conducted in French.
Prerequisites: FR 313 with D- or better

FR 421. FRENCH CONVERSATION FOR ADVANCED SPEAKERS IV. (1 Credit)
Designed for students who would like to continue developing listening and speaking skills in French through independent work with a variety of media. Graded P/N.
Prerequisites: FR 313 with D- or better

FR 422. FRENCH CONVERSATIONS FOR ADVANCED SPEAKERS V. (1 Credit)
Designed for students who would like to continue developing listening and speaking skills in French through independent work with a variety of media. Graded P/N.
Prerequisites: FR 313 with D- or better

FR 423. FRENCH CONVERSATION FOR ADVANCED SPEAKERS VI. (1 Credit)
Designed for students who would like to continue developing listening and speaking skills in French through independent work with a variety of media.
Prerequisites: FR 313 with D- or better
FR 439. *FRENCH/FRANCOPHONE STUDIES. (3 Credits)
Variable topics in language, culture, or literature. May be repeated for credit when topic varies. Conducted in French. Not offered every year.
(Writing Intensive Course)
*Attributes: CWIC – Core, Skills, WIC
*This course is repeatable for 9 credits.

FR 449. SELECTED TOPICS IN FRANCOPHONE LITERATURE. (3 Credits)
Conducted in French. May be repeated for credit when topic varies. Not offered every year.
*This course is repeatable for 9 credits.

FR 488. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
Variable topics in language, culture, or literature. May be repeated for credit when topic varies. See Schedule of Classes for current offerings and prerequisites. Not offered every year.
*Attributes: HNRS – Honors Course Designator
*Equivalent to: FR 499
*This course is repeatable for 12 credits.

FR 499. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
*Equivalent to: FR 499H
*This course is repeatable for 9 credits.

FR 499H. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. See Schedule of Classes for current offerings and prerequisites. Not offered every year.
*Attributes: HNRS – Honors Course Designator
*Equivalent to: FR 499
*This course is repeatable for 9 credits.

FR 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

FR 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

FR 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

FR 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

FR 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

FR 511. FOURTH-YEAR FRENCH. (3 Credits)
A language-use course; primary emphasis on developing oral and written proficiency; extensive practice in speaking and writing. Grammar review; vocabulary study; analysis of writing styles and techniques; oral reports and original presentations in French; original compositions. Conducted in French.
*Recommended: FR 313

FR 539. FRENCH/FRANCOPHONE STUDIES. (3 Credits)
Variable topics in language, culture, or literature. May be repeated for credit when topic varies. Conducted in French. See Schedule of Classes for current topics and prerequisites. Not offered every year.
*This course is repeatable for 12 credits.

FR 588. FRENCH STUDIES, FRENCH STUDY CENTERS. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, French language. Section 2: Practical work (exercises). Section 3: Topics, French arts and letters. Section 4: Topics, France and French society.
*This course is repeatable for 12 credits.

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**General Science (GS)**

GS 199. SPECIAL STUDIES. (1-16 Credits)
Equivalent to: BHS 199
*This course is repeatable for 16 credits.

GS 399. SPECIAL TOPICS. (1-16 Credits)
*This course is repeatable for 16 credits.

GS 401. RESEARCH. (1-16 Credits)
Equivalent to: BHS 401
*This course is repeatable for 16 credits.

GS 403. THESIS. (1-16 Credits)
Equivalent to: BHS 403
*This course is repeatable for 16 credits.

GS 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: BHS 405
*This course is repeatable for 16 credits.

GS 407. SEMINAR. (1-16 Credits)
One-credit sections. Graded P/N.
Equivalent to: BHS 407
*This course is repeatable for 16 credits.

GS 410. SCIENCE INTERNSHIP. (1-12 Credits)
Supervised scientific work experience at selected cooperating institutions, agencies, laboratories, or companies. Graded P/N.
Equivalent to: BHS 410
*This course is repeatable for 12 credits.

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**Geography (GEOG)**

GEOG 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

GEOG 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

GEOG 100. *CLIMATE JUSTICE. (3 Credits)
Unequal distribution of social, economic and political power that creates winners and losers from climate change. Case studies of climate-change-related environmental degradation, conflict, conservation, climate denial, renewable energy, and investment. Concepts and actions to promote climate justice. Lec/rec. (Bacc Core Course)
*Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

GEOG 102. *PHYSICAL GEOGRAPHY. (4 Credits)
Processes that shape the earth's surface. Weathering, mass movement, landforms, river systems, groundwater, biogeography, human effects on the landscape. Use of maps and imagery. (Bacc Core Course)
*Attributes: CPPS – Core, Pers, Physical Science
*Equivalent to: GEO 102

GEOG 103. *HUMAN GEOGRAPHY. (3 Credits)
Introduction to how human activity affects or is influenced by the earth's surface, including languages, religions, migration, development, and resources. (Bacc Core Course)
*Attributes: CPSI – Core, Pers, Soc Proc & Inst
GEOG 105. *GEOGRAPHY OF THE NON-WESTERN WORLD. (3 Credits)
An introduction to the rich variety of environments, population and settlement dynamics, cultures, geopolitical changes, and economies in Africa, the Middle East, and Asia. Lec/lab/rec. (Bacc Core Course) Equivalent course is GEO 105.
Attributes: CPSI – Core, Pers, Cult Diversity
Equivalent to: GEO 105

GEOG 106. *GEOGRAPHY OF THE WESTERN WORLD. (3 Credits)
An introduction to the rich variety of environments, population and settlement dynamics, cultures, geopolitical changes, and economics in Europe and Russia, Australia and Oceania, and the Americas. Lec/rec. (SS) (Bacc Core Course) Equivalent course is GEO 106.
Attributes: CPWC – Core, Pers, West Culture; LACS – Liberal Arts Social Core
Equivalent to: GEO 106

GEOG 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 201. *FOUNDATIONS OF GEOSPATIAL SCIENCE AND GIS. (4 Credits)
Basic physical science principles underlying geospatial technologies such as GPS, mobile devices, and online mapping and navigation tools used in GIS, remote sensing, and geovisualization. Concepts and applications in government, business, and the environment. (Bacc Core Course) Equivalent course is GEO 301.
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: GEO 301

GEOG 203. *HUMAN-ENVIRONMENT GEOGRAPHY. (3 Credits)
How human societies manage resources, physical limits to sustainability, role of science in the use and management of resources, and how societal resource use adversely affects other societies, in human history and across spatial scales. Lec/rec. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

GEOG 240. *CLIMATE CHANGE, WATER AND SOCIETY. (3 Credits)
Introduction to social, ecological and economic impacts of climate change induced water problems in various geographic regions and cultures. Approaches to climate change mitigation and adaptation in various parts of the world. (Bacc Core Course) Equivalent course is GEO 204.
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: GEO 204

GEOG 250. *LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES. (3 Credits)
Overview of the history and current practices of land use and community planning. Use basic geospatial tools to assess land use patterns and planning processes. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

GEOG 251. *GEOGRAPHY OF DISASTER MANAGEMENT. (3 Credits)
Introduction to the geographic concepts and processes for effective disaster management, including response, recovery, mitigation and preparedness. Risk assessment and evidence-based best practices to prepare and respond to emergencies in a variety of geographic contexts. (Bacc Core Course) Equivalent course is GEO 205.
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: GEO 205

GEOG 295. INTRODUCTION TO GEOGRAPHIC FIELD RESEARCH. (3 Credits)
Introduction to field research in geography. Practice skills including observation, posing of questions, and collection and analysis of data. Focus on theory-based geographic study design, proposal development, and research critiques.
Equivalent to: GEO 296
Recommended: GEO 102 or GEO 103 or GEO 201 or GEO 203

GEOG 299. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 300. *SUSTAINABILITY FOR THE COMMON GOOD. (3 Credits)
Geography of human relationships to the earth’s systems with an emphasis on individual impacts and collective efforts to achieve environmental sustainability. Lec/rec. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society; LACS – Liberal Arts Social Core
Equivalent to: GEO 300, GEO 300H

GEOG 300H. *SUSTAINABILITY FOR THE COMMON GOOD. (3 Credits)
Geography of human relationships to the earth’s systems with an emphasis on individual impacts and collective efforts to achieve environmental sustainability. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: GEO 300

GEOG 311. *GEOGRAPHY OF AFRICA. (3 Credits)
An introduction to the physical, historical, cultural, political, and development geography of Africa south of the Sahara. (NC) (Bacc Core Course) Equivalent course is GEO 325.
Attributes: CPSI – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: GEO 325

GEOG 313. *GEOGRAPHY OF ASIA. (3 Credits)
Geographic analysis of Asia’s lands and peoples. Emphasis on regional physical environments, resources and development potentials, population trends, and international importance to the United States. Offered once every other year. (NC) (Bacc Core Course) Equivalent course is GEO 327.
Attributes: CPSI – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: GEO 327

GEOG 314. *GEOGRAPHY OF LATIN AMERICA. (3 Credits)
Focuses on the diverse landscapes, peoples and cultural traditions of Latin America, a vast region extending from the United States-Mexican border to the southern tip of South America. (NC) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: GEO 328

GEOG 323. *CLIMATOLOGY. (4 Credits)
Systematic analysis of global and regional climates. Physical principles of climate, climate classifications, and distribution and characteristics of climate regimes. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GEOG 102 with D- or better or GEOG 202 with D- or better or GEOG 102 with D- or better
Equivalent to: GEO 323
GEOG 324. *ECOLOGICAL BIOGEOGRAPHY. (4 Credits)
Spatial distributions and change over time of species, communities, and biomes. Effect of climate, tectonics, disturbance on evolution, extinction, and succession. Implications for conservation. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GEOG 102 with D- or better or (BI 370 with C- or better or BI 370H with C- or better)
Equivalent to: GEO 324

GEOG 330. **GEOGRAPHY OF INTERNATIONAL DEVELOPMENT AND GLOBALIZATION. (3 Credits)
Introduction to the geography of global wealth and inequality with a focus on contemporary development, underdevelopment, and globalization problems in Asian, African, Caribbean, Latin American, and Pacific Island countries. (Bacc Core Course) (Writing Intensive Course) Equivalent course is GEO 330.
Attributes: CSGI – Core, Synth, Global Issues; CWIC – Core, Skills, WIC
Equivalent to: GEO 330
Recommended: GEOG 105 or GEOG 106 or GEO 105 or GEO 106

GEOG 331. *POPULATION, CONSUMPTION, AND ENVIRONMENT. (3 Credits)
An examination of population patterns and trends, emphasizing historical growth and more recent demographic changes; using geographic tools to understand patterns of spatial distribution, to use and analyze data sources, and to gain experience interpreting and displaying data about population structure and dynamics; and developing the ability to evaluate the relationship between population, consumption, resources, and quality of life. Patterns of consumption, as individuals and societies will be examined and different future scenarios will be examined with reference to environmental, social and economic sustainability. (Bacc Core Course) Equivalent course is GEO 350.
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: GEO 350

GEOG 340. *INTRODUCTION TO WATER SCIENCE AND POLICY. (3 Credits)
Policy and science of the hydrologic cycle. Emphasis on interaction between water’s natural time-space fluctuations and human uses. (Bacc Core Course) Equivalent course is GEO 335 and SOIL 335.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: CSS 335, CSS 335H, GEO 335, GEO 335H, GEOG 340H, SOIL 335

GEOG 340H. *INTRODUCTION TO WATER SCIENCE AND POLICY. (3 Credits)
Policy and science of the hydrologic cycle. Emphasis on interaction between water’s natural time-space fluctuations and human uses. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: CSS 335, CSS 335H, GEO 335, GEO 335H, GEOG 340H, SOIL 335

GEOG 350. *GEOGRAPHY OF NATURAL HAZARDS. (3 Credits)
Introduction to the geography of risk, natural hazards, and disasters, focusing on concepts of vulnerability, adaptation and resilience of human society in the Pacific Northwest and globally. Equivalent course is GEO 304.
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: GEO 304

GEOG 350. GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY. (4 Credits)
Fundamentals of spatial data, geographic information systems (GIS), and introductory spatial analysis, programming, and modeling. Equivalent course is GEO 365 and GEO 465.
Equivalent to: GEO 365

GEOG 361. GISCIENCE II: ANALYSIS AND APPLICATIONS. (4 Credits)
Applications-based course. Development and conduct of geospatial analyses using various spatial data structures, techniques and models. Students acquire, clean, integrate, manipulate, visualize and analyze geospatial data through laboratory work. Lec/lab. Equivalent course is GEO 480.
Prerequisites: GEOG 360 with C- or better and MTH 112 [C-] and (ST 201 [C-] or ST 351 [C-])
Equivalent to: GEO 480

GEOG 370. GEOVISUALIZATION: CARTOGRAPHY. (4 Credits)
Basic cartographic principles. Design, compilation, and construction of maps. Equivalent course is GEO 360.
Prerequisites: GEOG 201 with D- or better or GEO 301 with D- or better
Equivalent to: GEO 360

GEOG 371. GEOVISUALIZATION: WEB MAPPING. (4 Credits)
Current developments in Internet mapping and advanced cartographic skills applied to web-based maps. Techniques of Internet mapping and principles of web-based cartography, including multimedia, animation, 3D visualization, and user interface design. Lec/lab.
Prerequisites: GEOG 201 with D- or better or GEO 301 with D- or better

GEOG 399. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: GEO 399H

GEOG 399H. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: GEO 399

GEOG 400. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged.
This course is repeatable for 48 credits.

GEOG 401. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.

GEOG 403. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.

GEOG 405. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.

GEOG 407. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

GEOG 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
GEOG 410. INTERNSHIP. (1-16 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 16 credits.
Recommended: 12 credits of upper-division geography

GEOG 423. SNOW HYDROLOGY. (3 Credits)
Fundamentals of snow hydrology. Physical principles of snow formation, snowpack accumulation, energy balance, snowcover-climate interactions, snow metamorphism, snowpack ablation, snowpack/snowmelt chemistry, remote sensing of snow, avalanches, field methods, snowmelt/ runoff modeling techniques, and watershed processes. Equivalent course is GEO 483.
Equivalent to: GEO 483

GEOG 424. HYDROLOGY FOR WATER RESOURCES MANAGEMENT. (3 Credits)
A quantitative introduction to surface and subsurface hydrology with a focus on decision making for the water resource professional.
Prerequisites: MTH 251 with C- or better

GEOG 430. RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT. (3 Credits)
Causes and consequences of conflict over natural resource management at local to global scales; principles for managing social-ecological systems for resilience. Field trip(s) may be required; transportation fee charged. Equivalent course is GEO 420.
Equivalent to: GEO 420

GEOG 431. GLOBAL RESOURCES AND DEVELOPMENT. (3 Credits)
Examines resource development issues and strategies in the Global South. Issues and strategies from agriculture, forestry, fisheries, energy, wildlife management, mineral development, land use, and health are examined. Equivalent course is GEO 426.
Equivalent to: GEO 426

GEOG 432. *GEOGRAPHY OF FOOD AND AGRICULTURE. (3 Credits)
Overview of food and agriculture in relation to production and consumption regions as a basis for distinguishing different types of food and agricultural systems. Local and global examination of the geographic aspects of breeding, location in agricultural systems, and adaptation in agro-ecosystems using field study, explorations of literature, and lecture. Field trip required, transportation fee charged. (Bacc Core Course) Equivalent course is GEO 449.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: GEO 449

GEOG 433. CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY. (3 Credits)
Climate change poses challenges for human security and well-being, and for social and economic development. Evaluate how climate change impacts vary based on vulnerability, exposure, sensitivity, adaptive capacity, and risk.
Prerequisites: ATS 201 with C- or better or GEOG 240 with C- or better or GEOG 323 with C- or better

GEOG 440. WATER RESOURCES MANAGEMENT IN THE UNITED STATES. (3 Credits)
An investigation of the various approaches to water resources geography within the U.S. Explores the disciplines that address water resources management, their tools, and their limitations. Topics include engineering, law, economics, risk assessment, game theory, conflict resolution, and the fine arts. Equivalent course is GEO 425.
Equivalent to: GEO 425
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 441. INTERNATIONAL WATER RESOURCES MANAGEMENT. (3 Credits)
An investigation of the various approaches to water resources geography at the international level. Explores the interaction between water science and policy through issues of current ‘hydropolitics’ and water resources development. Topics include water quality, dams and development, conflict and cooperation, climate change, and water institutions. Equivalent course is GEO 424.
Equivalent to: GEO 424
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 450. LAND USE IN THE AMERICAN WEST. (3 Credits)
Development of a conceptual framework for land use study; analysis of land as a resource, land use trends, land use principles, and management issues as related to planning, focusing on the American West, the fastest growing region in the nation. Equivalent course is GEO 423.
Equivalent to: GEO 423

GEOG 451. PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES. (4 Credits)
Applies GIS skills and techniques to determine and analyze future land uses. Determine suitable land uses that incorporate community goals, site constraints and minimize use conflicts. Regulatory and market-based implementation strategies for land uses will also be discussed. Lec/lab.
Equivalent course is GEO 452.
Prerequisites: GEOG 360 with C- or better or GEOG 560 with C- or better or GEO 365 with C- or better or GEO 465 with C- or better
Equivalent to: GEO 452

GEOG 452. SUSTAINABLE SITE PLANNING. (3 Credits)
Use of geographic concepts and techniques in site planning to create sustainable management reports for local sites. Inventory of environmental characteristics and human uses, conceptual design for future uses of the site, principles of green infrastructure and sustainable building practices. Local field trip required, transportation fee charged.
Equivalent to: ENSC 452, GEO 451
Recommended: GEOG 250

GEOG 456. GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS. (4 Credits)
Introduction to the extension of geographic information systems (GIS) through programming. No prior programming experience is expected. Teaches a pragmatic approach to design and write programs for geospatial analysis. Equivalent course is GEO 578.
Prerequisites: GEOG 361 with C- or better or GEOG 561 with C- or better or GEO 480 with C- or better
Equivalent to: GEO 578

GEOG 463. GISCIENCE IV: SPATIAL MODELING. (4 Credits)
Introduction to spatial simulation models representing attraction, segregation, individual entities, and processes of spread, applied to contemporary problems in human and physical geography.
Prerequisites: GEOG 462 with C- or better or GEOG 562 with C- or better or GEO 578 with C- or better
GEOG 464. GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS. (3 Credits)
Applications and implications of geospatial science (GIS, remote sensing, and spatial analysis) in intelligence, human, environmental, and ethical domains. Concepts and practices of ethics in geospatial science, including data access, management, visualization, and decision-making. Equivalent course is GEO 567.
Prerequisites: GEOG 360 with C- or better or GEO 560 with C- or better or GEO 365 with C- or better or GEO 465 with C- or better
Equivalent to: GEO 567
Recommended: Senior standing

GEOG 472. GEOVISUALIZATION: GEOVISUAL ANALYTICS. (3 Credits)
Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages. Lec/lab. Equivalent course is GEO 445.
Prerequisites: GEOG 370 with C- or better or GEOG 371 with C- or better or GEO 360 with C- or better
Equivalent to: GEO 445

GEOG 480. REMOTE SENSING I: PRINCIPLES AND APPLICATIONS. (4 Credits)
Fundamentals of satellite remote sensing and image analysis. Topics include physical principles of remote sensing from the ultraviolet to the microwave, sensors and sensor technology, and environmental applications of remote sensing through image analysis. Lec/lab. Equivalent course is GEO 444.
Prerequisites: GEOG 201 with C- or better or GEO 301 with C- or better
Equivalent to: GEO 444

GEOG 481. REMOTE SENSING II: DIGITAL IMAGE PROCESSING. (4 Credits)
Digital analysis of remote sensor data. Image display enhancement, classification, and rectification principles. Practical experience with an image processing system. Equivalent course is GEO 466.
Prerequisites: (GEOG 480 with C- or better or GEOG 580 with C- or better or GEO 444 with C- or better or GEO 544 with C- or better) and (ST 202 [D-] or ST 352 [D-])
Equivalent to: GEO 466

GEOG 495. FIELD GEOGRAPHY SYNTHESIS. (3 Credits)
Explore how geographers use field work to investigate landscapes such as mountains, forests, coasts, tundra and desert to understand how they were formed and explain how they have changed over time. Learn techniques for finding out how landscape processes impact humans and, in turn, how humans impact the environment around them. Apply geographic theories and concepts to synthesize, analyze and interpret the relationship between human communities and the environment through the planning and execution of field work.
Prerequisites: GEOG 295 with C- or better or GEO 295 with C- or better
Equivalent to: GEO 435
Recommended: Junior or senior standing

GEOG 499. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 500. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee charged. Students may prepare guides for trips. Faculty sponsor must be prearranged. This course is repeatable for 48 credits.

GEOG 501. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged. This course is repeatable for 24 credits.

GEOG 503. THESIS. (1-16 Credits)
Independent, original study that culminates in a thesis. Faculty sponsor must be prearranged. This course is repeatable for 999 credits.

GEOG 505. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged. This course is repeatable for 16 credits.

GEOG 507. SEMINAR. (1-16 Credits)
Graded P/N. This course is repeatable for 16 credits.

GEOG 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 510. INTERNSHIP. (1-15 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N. This course is repeatable for 16 credits.

GEOG 511. HISTORY AND PHILOSOPHY OF GEOGRAPHY. (3 Credits)
The historical development of research traditions in the discipline of geography. This includes an examination of changes in conceptual structures and current trends. Equivalent course is GEO 515.
Equivalent to: GEO 515

GEOG 512. SOCIAL-ECOLOGICAL SYSTEMS. (3 Credits)
Exploration of critical debates surrounding theories associated with social-ecological systems, resilience, vulnerability, adaptation, social learning, transformation, adaptive governance. Equivalent course is GEO 554.
Equivalent to: GEO 554
Recommended: 9 credits of graduate study.

GEOG 523. SNOW HYDROLOGY. (3 Credits)
Fundamentals of snow hydrology. Physical principles of snow formation, snowpack accumulation, energy balance, snowcover-climate interactions, snow metamorphism, snowpack ablation, snowpack/snowmelt chemistry, remote sensing of snow, avalanches, field methods, snowmelt/ runoff modeling techniques, and watershed processes. Equivalent course is GEO 583.
Equivalent to: GEO 583

GEOG 524. HYDROLOGY FOR WATER RESOURCES MANAGEMENT. (3 Credits)
A quantitative introduction to surface and subsurface hydrology with a focus on decision making for the water resource professional.
Recommended: MTH 251

GEOG 530. RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT. (3 Credits)
Causes and consequences of conflict over natural resource management at local to global scales; principles for managing social-ecological systems for resilience. Field trip(s) may be required; transportation fee charged. Equivalent course is GEO 520.
Equivalent to: GEO 520
GEOG 531. GLOBAL RESOURCES AND DEVELOPMENT. (3 Credits)
Examines resource development issues and strategies in the Global South. Issues and strategies from agriculture, forestry, fisheries, energy, wildlife management, mineral development, land use, and health are examined. Equivalent course is GEO 526.
Equivalent to: GEO 526

GEOG 532. GEOGRAPHY OF FOOD AND AGRICULTURE. (3 Credits)
Overview of food and agriculture in relation to production and consumption regions as a basis for distinguishing different types of food and agricultural systems. Local and global examination of the geographic aspects of breeding, location in agricultural systems, and adaptation in agro-ecosystems using field study, explorations of literature, and lecture. Field trip required, transportation fee charged. Equivalent course is GEO 549.
Equivalent to: GEO 549

GEOG 533. CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY. (3 Credits)
Climate change poses challenges for human security and well-being, and for social and economic development. Evaluate how climate change impacts vary based on vulnerability, exposure, sensitivity, adaptive capacity, and risk.

GEOG 540. WATER RESOURCES MANAGEMENT IN THE UNITED STATES. (3 Credits)
An investigation of the various approaches to water resources geography within the U.S. Explores the disciplines that address water resources management, their tools, and their limitations. Topics include engineering, law, economics, risk assessment, game theory, conflict resolution, and the fine arts. Equivalent course is GEO 525.
Equivalent to: GEO 525
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 541. THE WORLD’S WATER. (3 Credits)
An investigation of the various approaches to water resources geography at the international level. Explores the interaction between water science and policy through issues of current ‘hydropolitics’ and water resources development. Topics include water quality, dams and development, conflict and cooperation, climate change, and water institutions. Equivalent course is GEO 524.
Equivalent to: GEO 524
Recommended: 9 credits of upper-division geography and any course dealing with the hydrologic cycle.

GEOG 546. ADVANCED LANDSCAPE AND SEASCAPE ECOLOGY. (4 Credits)
Pattern-process interactions in large scale ecological and physical systems, including terrestrial, aquatic, and marine/ocean ecosystems. Principles of pattern-process interactions from genetic to community levels of ecological organization applied to design of conservation reserves. Hypothesis testing, field techniques, spatial models/statistics, GIS/remote sensing. Lec/lab. Equivalent course is GEO 546.
Equivalent to: GEO 546

GEOG 550. LAND USE IN THE AMERICAN WEST. (3 Credits)
Development of a conceptual framework for land use study; analysis of land as a resource, land use trends, land use principles, and management issues as related to planning, focusing on the American West, the fastest growing region in the nation. Equivalent course is GEO 523.
Equivalent to: GEO 523

GEOG 551. PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES. (4 Credits)
Applies GIS skills and techniques to determine and analyze future land uses. Determine suitable land uses that incorporate community goals, site constraints and minimize use conflicts. Regulatory and market-based implementation strategies for land uses will also be discussed. Lec/lab. Equivalent course is GEO 552.
Prerequisites: GEOG 360 with C or better or GEOG 560 with C or better
Equivalent to: GEO 552

GEOG 552. SUSTAINABLE SITE PLANNING. (3 Credits)
Use of geographic concepts and techniques in site planning to create sustainable management reports for local sites. Inventory of environmental characteristics and human uses, conceptual design for future uses of the site, principles of green infrastructure and sustainable building practices. Local field trip required, transportation fee charged. Equivalent course is GEO 551.
Equivalent to: GEO 551
Recommended: GEOG 250

GEOG 554. GISCIENCE I: INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE. (4 Credits)
Introduction to modern spatial data processing, development, and functions of geographic information systems (GIS); theory, concepts and applications of geographic information science (GIScience). Equivalent course is GEO 565.
Equivalent to: GEO 565

GEOG 556. GISCIENCE II: ANALYSIS AND APPLICATIONS. (4 Credits)
Applications-based course. Development and conduct of geospatial analyses using various spatial data structures, techniques and models. Students acquire, clean, integrate, manipulate, visualize and analyze geospatial data through laboratory work. Lec/lab. Equivalent course is GEO 580.
Prerequisites: GEOG 560 with C or better
Equivalent to: GEO 580

GEOG 560. GISCIENCE III: PROGRAMMING FOR GEOSPATIAL ANALYSIS. (4 Credits)
Introduction to the extension of geographic information systems (GIS) through programming. No prior programming experience is expected. Teaches a pragmatic approach to design and write programs for geospatial analysis. Equivalent course is GEO 578.
Prerequisites: GEOG 361 with C or better or GEOG 561 with C or better
Equivalent to: GEO 578

GEOG 563. GISCIENCE IV: SPATIAL MODELING. (4 Credits)
Introduction to spatial simulation models representing attraction, segregation, individual entities, and processes of spread, applied to contemporary problems in human and physical geography.
Prerequisites: GEOG 462 with C or better or GEOG 562 with C or better

GEOG 564. GEOSPATIAL PERSPECTIVES ON INTELLIGENCE, SECURITY AND ETHICS. (3 Credits)
Applications and implications of geospatial science (GIS, remote sensing, and spatial analysis) in intelligence, human, environmental, and ethical domains. Concepts and practices of ethics in geospatial science, including data access, management, visualization, and decision-making. Equivalent course is GEO 567.
Prerequisites: GEOG 360 with C or better or GEOG 560 with C or better
Equivalent to: GEO 567
GEOG 565. SPATIO-TEMPORAL VARIATION IN ECOLOGY AND EARTH SCIENCE. (4 Credits)
Objectives and techniques of spatial and temporal analysis. Point patterns, geostatistics, spectral analysis, wavelet analysis, interpolation, and mapping. Equivalent course is GEO 541.
Equivalent to: GEO 541

GEOG 566. ADVANCED SPATIAL STATISTICS AND GISCIENCE. (4 Credits)
Provides advanced graduate students from a variety of disciplines in earth science and ecology the opportunity to structure and conduct spatio-temporal analyses using available software tools and their own datasets for their graduate research. Equivalent course is GEO 584.
Equivalent to: GEO 584

GEOG 571. GEOVISUALIZATION: WEB MAPPING. (4 Credits)
Overview of methods and applications in interactive, dynamic cartographic visualization. Design and construction of customized user interfaces to geographic information. Lec/lab. Equivalent course is GEO 568.
Equivalent to: GEO 568
Recommended: GEOG 370

GEOG 572. GEOVISUALIZATION: GEOVISUAL ANALYTICS. (3 Credits)
Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages. Lec/lab. Equivalent course is GEO 545.
Equivalent to: GEO 545
Recommended: GEOG 370 or GEOG 371

GEOG 580. REMOTE SENSING I: PRINCIPLES AND APPLICATIONS. (4 Credits)
Fundamentals of satellite remote sensing and image analysis. Topics include physical principles of remote sensing from the ultraviolet to the microwave, sensors and sensor technology, and environmental applications of remote sensing through image analysis. Lec/lab. Equivalent course is GEO 544.
Equivalent to: GEO 544
Recommended: GEOG 201 or GEO 301

GEOG 581. REMOTE SENSING II: DIGITAL IMAGE PROCESSING. (4 Credits)
Digital analysis of remote sensor data. Image display enhancement, classification, and rectification principles. Practical experience with an image processing system. Equivalent course is GEO 566.
Prerequisites: GEOG 580 with C or better
Equivalent to: GEO 566
Recommended: ST 352 or ST 202

GEOG 595. FIELD GEOGRAPHY OF OREGON II. (3 Credits)
Designed to introduce students to the widest possible range of topics on all aspects of Oregon geography within a limited time, then turn that experience into a viable research proposal. While physical processes are the primary topic, resource and environmental effects are stressed. Field trip required, transportation fee charged. Equivalent course is GEO 534.
Equivalent to: GEO 534

GEOG 596. FIELD RESEARCH IN GEOMORPHOLOGY AND LANDSCAPE ECOLOGY. (3 Credits)
Natural history interpretation of disturbance and recovery processes and management implications in forest-stream landscapes of western Oregon. Course consists of field experience and several seminars. Transportation and lodging fee charged. Equivalent course is GEO 548.
Equivalent to: GEO 548
Recommended: 9 graduate credits in sciences or engineering.

GEOG 599. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 24 credits.

GEOG 600. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee charged. Students may prepare guides for trips. Faculty sponsor must be prearranged.
This course is repeatable for 48 credits.

GEOG 601. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.
This course is repeatable for 36 credits.

GEOG 603. THESIS. (1-16 Credits)
Independent, original study that culminates in a thesis Faculty sponsor must be prearranged.
This course is repeatable for 999 credits.

GEOG 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.

GEOG 607. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

GEOG 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

GEOG 699. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 24 credits.

Geophysics (GPH)

GPH 501. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N.
This course is repeatable for 24 credits.

GPH 503. THESIS. (1-16 Credits)
Thesis research and writing.
This course is repeatable for 999 credits.

GPH 505. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in geophysics, guided by discussions with supervising faculty. A written report may be required.
This course is repeatable for 16 credits.

GPH 507. SEMINAR. (1-16 Credits)
This course is repeatable for 48 credits.

GPH 601. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N.
This course is repeatable for 36 credits.

GPH 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

GPH 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in geophysics guided by discussions with supervising faculty. A written report may be required.
This course is repeatable for 16 credits.
GPH 607. SEMINAR. (1-16 Credits)
This course is repeatable for 48 credits.

GPH 630. ELEMENTS OF SEISMOLOGY. (4 Credits)
Survey of basic concepts in global seismology: world seismicity; elastic structure of the earth; seismic wave paths in the earth; locating earthquakes; earthquake focal mechanisms, magnitudes, stress drop, energy; stress and strain, elasticity, wave equation, plane waves in homogeneous and layered media, surface waves, free oscillations; ray theory; seismometry; earthquake prediction. Laboratory exercises include interpretation and analysis of seismograms from global seismographic networks.

Recommended: Differential equations.

GPH 632. CRUSTAL SEISMOLOGY. (3 Credits)
Structure of the earth's crust and upper mantle from seismic reflection and large offset (refraction, wide-angle reflection) data. Methods of data collection, data processing theory and practice, modeling and interpretation techniques, correlation of seismic results with laboratory measurements of rock properties, and regional case studies.

Prerequisites: GPH 630 with C or better

GPH 640. GEODESY. (4 Credits)
Physical and observational geodesy, including the Earth's gravity field and potential and determination of the Earth's geoid. Interpretation of geoid, geoid anomalies, and isostatic compensation. Gravity, point-position and remote sensing geodetic measurement techniques, including GPS, InSAR, VLBI, leveling, triangulation/trilateration, and low-Earth orbit gravity satellite missions are covered as are geodetic reference frames. Offered alternate years.

GPH 641. ELECTROMAGNETIC METHODS IN GEOPHYSICS. (3 Credits)
Survey of electromagnetic (EM) methods in geophysics. Review of electromagnetic theory, Maxwell's equations in the quasi-static limit, the diffusion of EM fields in a layered conductor, qualitative discussion of EM fields in 2- and 3-D conductors. EM techniques, including DC resistivity, magnetotellurics, controlled source EM, induced polarization, and long-period magnetometer array methods. Applications to exploration, to basic research on crustal structure and to studies of upper-mantle conductivity.

Recommended: Upper-division EM course.

GPH 642. EARTH MAGNETISM. (3 Credits)
Geomagnetism and magnetic potential: general morphology and secular change; internal and external sources; principles of paleomagnetism, including field and laboratory procedures; origin of remnant magnetism in rocks and the controlling physical and chemical processes; the origin of the Earth's magnetic field.

GPH 650. GEOPHYSICAL INVERSE THEORY. (4 Credits)
Survey of the theory and applications of inverse methods currently used in the geophysical sciences for the interpretation of inaccurate and inadequate data. Backus-Gilbert inverse theory, resolution, regularization methods (such as damped least squares) for linear and non-linear problems, stochastic inversion, and extremal models. Applications to seismic, gravity, magnetic and electromagnetic data.

Recommended: Linear algebra

GPH 651. GEODYNAMICS I. (3 Credits)
Application of the techniques of continuum mechanics to geological problems. Thermal and subsidence history of the lithosphere; stress and strain in the earth; elasticity and flexure of the lithosphere; gravitational compensation. Lec. Offered odd years on Corvallis campus in fall term (subject to change).

GPH 665. GEOPHYSICAL FIELD TECHNIQUES. (3 Credits)
Instrumentation, field methods and interpretation of gravimetric, magnetic, electrical and seismic prospecting techniques. Students will be required to collect, reduce, analyze, and interpret data.

GPH 689. SPECIAL TOPICS IN GEOPHYSICS. (1-4 Credits)
Special topics of current interest in geophysics, not covered in detail in other courses. May be repeated on different topics for credit.

This course is repeatable for 16 credits.

Geosciences (GEO)

GEO 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

GEO 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students' understanding of the connection between theory and practice in their respective disciplines.

GEO 100. *NATURAL DISASTERS: HOLLYWOOD VERSUS REALITY. (4 Credits)
Introduction to natural hazards, as seen through the lens of popular media. Course will explore the causes and consequences of natural disasters via in-class exercises and activities designed to develop students' skills in scientific analysis and problem solving. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

GEO 101. *THE SOLID EARTH. (4 Credits)
Solid earth processes and materials. Earthquakes, volcanoes, earth structure, rocks, minerals, ores. Solid earth hazard prediction and planning. Geologic time. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

GEO 199. SPECIAL STUDIES. (1-16 Credits)
Equivalent to: GEO 199H

This course is repeatable for 16 credits.

GEO 201. *PHYSICAL GEOLOGY. (4 Credits)
Study of earth's interior. Tectonic processes and their influence on mountains, volcanoes, earthquakes, minerals, and rocks. Field trip(s) required, transportation fee charged. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

Equivalent to: GEO 201H

GEO 202. *EARTH SYSTEMS SCIENCE. (4 Credits)
Surficial processes (glaciers, rivers), climate, soils, vegetation, and their interrelationships. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science

Equivalent to: GEO 201H, GEO 202H

GEO 203. *EVOLUTION OF PLANET EARTH. (4 Credits)
History of earth and life as interpreted from fossils and the rock record. Field trip(s) required; transportation fee charged. Lec/lab. (Bacc Core Course)

Attributes: CPPS – Core, Pers, Physical Science
GEO 221. *ENVIRONMENTAL GEOLOGY. (4 Credits)
Introductory geology emphasizing geologic hazards (volcanoes, earthquakes, landslides, flooding), geologic resources (water, soil, air, mineral, energy), and associated environmental problems and mitigation strategies. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

GEO 295. INTRODUCTION TO FIELD GEOLOGY. (3 Credits)
Two-week course taught in the fall program in various locations throughout the west. Collect field data to make geological maps, cross-sections, columns, and reports. Serves as an introduction to upper-level course work for Geology degree. Lec/lab.
Prerequisites: GEO 201 with C- or better

GEO 305. *LIVING WITH ACTIVE CASCADE VOLCANOES. (3 Credits)
The impact of volcanic activity on people, infrastructure, and natural resources; how and why volcanic activity in the Cascade Range occurs; volcano monitoring and hazard assessment. Field trip required, transportation fee charged. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 306. *MINERALS, ENERGY, WATER, AND THE ENVIRONMENT. (3 Credits)
Geologic occurrences, environmental consequences, and future of non-renewable earth resources, including metals, materials, oil, soil, and groundwater. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 307. *NATIONAL PARK GEOLOGY AND PRESERVATION. (3 Credits)
National parks as classrooms to study geological processes and the importance of preserving natural landscapes. Field trip(s) required; transportation fee charged. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: GEO 307H

GEO 307H. *NATIONAL PARK GEOLOGY AND PRESERVATION. (3 Credits)
National parks as classrooms to study geological processes and the importance of preserving natural landscapes. Field trip(s) required; transportation fee charged. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: GEO 307

GEO 308. *GLOBAL CHANGE AND EARTH SCIENCES. (3 Credits)
Study of global change over different time scales during the history of the earth, with emphasis on evolution of its atmosphere, plate tectonics, paleoclimates, and mass extinctions. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

GEO 309. *ENVIRONMENTAL JUSTICE. (3 Credits)
Technical and social issues surrounding the unequal exposure to environmental hazards based on race and the environmental justice movement that has grown to address charges of such environmental racism. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: WR 121 with C- or better or WR 121H with C- or better

GEO 309H.

GEO 310. EARTH MATERIALS I: MINERALOGY. (4 Credits)
Principles of crystal morphology, and structure. Characteristics, identification, and origins of minerals. Lec/lab.
Prerequisites: (GEO 201 with D- or better or GEO 221 with D- or better) and ((CH 121 with D- or better or (CH 231 with D- or better and CH 261 [D-]) or (CH 231 [D-] and CH 261H [D-])))

GEO 315. EARTH MATERIALS II: PETROLOGY. (4 Credits)
Origin, identification and classification of igneous, sedimentary, and metamorphic rocks. Field trip(s) required, transportation fee charged. Lec/lab.
Prerequisites: GEO 310 with D- or better

GEO 322. SURFACE PROCESSES. (4 Credits)
Examination of surficial processes and terrestrial landforms of the earth, including slopes, rivers, glaciers, deserts, and coastlines. Field trip(s) required; transportation fee charged. Lec/lab.
Prerequisites: (GEO 102 with D- or better or GEO 102H with D- or better or GEO 202 with D- or better and GEO 202H with D- or better) and (MTH 251 [C-] or MTH 251H [C-]) and (PH 201 [D-] or PH 201H [D-] or PH 211 [D-] or PH 211H [D-])

GEO 331. *ASTROBIOLOGY: LIFE BEYOND EARTH. (3 Credits)
Evaluates the potential distribution of life in the Universe, presents the science and technology used to search for life, and explores the societal impacts of its discovery.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended Completion of 12 credits of biological and physical science in the Bacc Core

GEO 340. STRUCTURAL GEOLOGY. (4 Credits)
Analysis of geometry and kinematics of geologic structures including brittle and ductile faults, folds, joints, deformation fabrics. Field trip(s) required; transportation fee charged. Lec/lab.
Prerequisites: GEO 201 with D- or better
Equivalent to: GEO 450

GEO 352. *OREGON: GEOLOGY, PLACE, AND LIFE ON THE RING OF FIRE. (4 Credits)
Provides an overview of the geology of Oregon in the context of the Pacific Northwest including tectonic setting, geologic features and landscapes, as well as topics and concepts of interest to society in general. Lessons will include discussion of the relationship between people and the landscape, incorporating the concept of ethnographic landscapes–geologic structures, natural resources and geologic hazards that are part of the identity of a place. Emphasizes written and graphic communication skills. Field trip required, transportation fee charged. Lec/lab. (Bacc core course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 352H. *OREGON: GEOLOGY, PLACE, AND LIFE ON THE RING OF FIRE. (4 Credits)
Provides an overview of the geology of Oregon in the context of the Pacific Northwest including tectonic setting, geologic features and landscapes, as well as topics and concepts of interest to society in general. Lessons will include discussion of the relationship between people and the landscape, incorporating the concept of ethnographic landscapes–geologic structures, natural resources and geologic hazards that are part of the identity of a place. Emphasizes written and graphic communication skills. Field trip required, transportation fee charged. Lec/lab. (Bacc core course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: GEO 352
GEO 370. STRATIGRAPHY AND SEDIMENTOLOGY. (4 Credits)
Basic principles of sedimentology and stratigraphy. Sedimentology is largely concerned with classifying and interpreting the origin of sedimentary rocks. Stratigraphy provides formal rules and strategies for organizing sedimentary (and other) rocks into a temporal framework. Reconstruction of Earth history with various approaches centered on paleoclimatology, paleogeography, paleooceanography, and tectonics. Lec/lab.
Prerequisites: GEO 201 with C- or better and GEO 203 [C-]
Equivalent to: GEO 470

GEO 380. *EARTHQUAKES IN THE PACIFIC NORTHWEST. (3 Credits)
Earthquake hazards in the Northwest; responses to reducing earthquake risk at state, local, and personal levels. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

GEO 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

GEO 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

GEO 400. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged. Graded P/N.
This course is repeatable for 48 credits.

GEO 401. RESEARCH. (1-16 Credits)
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged. Graded P/N.
This course is repeatable for 24 credits.

GEO 403. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged.
This course is repeatable for 24 credits.

GEO 405. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.
This course is repeatable for 16 credits.

GEO 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: GEO 407H
This course is repeatable for 12 credits.

GEO 407H. SEMINAR. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: GEO 407
This course is repeatable for 12 credits.

GEO 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 12 credits.

GEO 410. INTERNSHIP. (1-15 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 48 credits.

GEO 412. IGNEOUS PETROLOGY. (4 Credits)
Petrogenesis of igneous rocks. Petrographic analysis using polarizing microscopes. Field trip may be required, transportation fee charged. Lec/lab.
Prerequisites: GEO 315 with D- or better
Recommended: GEO 415 [C-]

GEO 415. EARTH MATERIALS III: PETROGRAPHY. (4 Credits)
Microscope-based study of minerals and igneous, sedimentary and metamorphic rocks. Representation and interpretation of geological processes based on microscopic observation. Lec/lab.
Prerequisites: GEO 201 with D- or better and GEO 310 [D-] and GEO 315 [D-]
Equivalent to: GEO 320

GEO 427. *VOLCANOLOGY. (4 Credits)
A survey of volcanoes: their distribution, forms, composition, eruptive products, eruptive styles, and associated phenomena. Field trip may be required; transportation fee charged. Offered alternate years. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GEO 315 with D- or better

GEO 430. GEOCHEMISTRY. (4 Credits)
Principles of geochemistry applied to problems of earth science. Field trip(s) may be required; transportation fees charged. Lec/rec.
Prerequisites: GEO 315 (may be taken concurrently) with D- or better and (((CH 121 with D- or better and CH 122 [D-]) or ((CH 231 [D-] or CH 231H [D-]) and (CH 261 [D-] or CH 261H [D-])) and (CH 232 [D-] or CH 232H [D-]) and (CH 262 [D-] or CH 262H [D-]) )
Equivalent to: GEO 449

GEO 431. ENVIRONMENTAL GEOCHEMISTRY. (3 Credits)
An introduction to natural processes at and near the earth's surface, as well as an examination of the impact of human activities on the natural environment. Study includes discussion of the sources, transformations, transport, and fate of contaminants. Field trip(s) required; transportation fee charge.
Prerequisites: (CH 121 with D- or better and CH 122 [D-] and CH 123 [D-]) or ((CH 231 [D-] or CH 231H [D-]) and (CH 232 [D-] or CH 232H [D-]) and (CH 233 [D-] or CH 233H [D-])]

GEO 432. APPLIED GEOMORPHOLOGY. (3 Credits)
Effect of landform processes upon human activity; consequences of resource management strategies on erosional balance within landscapes; identification of mitigation of natural hazards; role of geomorphic process studies in environmental planning. Taught as seminar, themes TBA. Field trip(s) may be required; transportation fee charged.
Equivalent to: GEO 449
Recommended: GEO 322

GEO 433. COASTAL GEOMORPHOLOGY. (3 Credits)
Morphodynamic approach to coastal landforms, processes and evolution including the impacts and response of humans to coastal change.
Prerequisites: (PH 211 with D- or better or PH 211H with D- or better) and (PH 212 [D-] or PH 212H [D-]) and GEO 322 [D-]
Recommended: MTH 251 [D-] and MTH 252 [D-]

GEO 440. ECONOMIC GEOLOGY. (4 Credits)
Principles of the origin, distribution, and importance of metallic mineral deposits formed by magmatic, hydrothermal, and sedimentary processes.
Lec/lab.
Prerequisites: GEO 315 with D- or better
Recommended: GEO 340 [C-]
GEO 461. GEOLOGY OF EARTHQUAKES. (3 Credits)  
Tectonics of the present day as based on surface geology, geodesy, seismicity, and crustal structure; description of active faults and folds; use of neotectonics in evaluation of earthquake hazard. Field trip(s) may be required; transportation fee charged. Offered alternate years.  
**Prerequisites:** GEO 340 with D- or better

GEO 463. GEOPHYSICS AND TECTONICS. (4 Credits)  
Geophysical observations as constraints on geologic interpretation. Lec/lab. (Writing Intensive Course)  
**Attributes:** CWIC – Core, Skills, WIC  
**Equivalent to:** GPH 463  
**Recommended:** MTH 251 [D-] and (PH 202 [D-] or PH 212 [D-])

GEO 481. GLACIAL GEOLOGY. (4 Credits)  
Mass balance of glaciers, physics of glacial flow, processes of glacial erosion and deposition, glacial meltwater, glacial isostasy and eustasy, and Quaternary stratigraphy. Field trip(s) may be required; transportation fee charged. Lec/lab. Offered alternate years.  
**Recommended:** GEO 202 [C-]

GEO 484. INTRODUCTION TO BIOGEOCHEMISTRY. (3 Credits)  
Interdisciplinary course, applying concepts from chemistry, physics, biology and geology to Earth systems including terrestrial, ocean and freshwater environments; water and energy cycles; carbon, nitrogen, phosphorus and sulfur cycles; biogeochemical cycles through Earth history.  
**Prerequisites:** MTH 111 with D- or better and (((CH 121 with D- or better and CH 122 [D-]) or (CH 231 [D-] and CH 261 [D-]) and CH 232 [D-] and CH 262 [D-]) or (GEO 295 with C- or better and GEO 315 [C-] and GEO 340 [C-] and GEO 370 [C-]) and GEO 484 [C-] and GEO 495 [C-])

GEO 485. QUATERNARY PALEOClimATOLOGY. (3 Credits)  
Introduction to geochronology, climate proxies, climate forcing, and climate modeling applied to paleoclimatic problems. Emphasis on Quaternary climate history.  
**Prerequisites:** (GEO 202 with D- or better or GEO 203 with D- or better) and (CH 122 [D-] or CH 222 [D-] or (CH 232 [D-] or CH 232H [D-]) and (CH 262 [D-] or CH 262H [D-] or CH 272 [D-]))

GEO 487. HYDROGEOLOGY. (4 Credits)  
**Prerequisites:** MTH 252 with D- or better or MTH 252H with D- or better

GEO 488. QUATERNARY STRATIGRAPHY OF NORTH AMERICA. (3 Credits)  
Stratigraphic principles applied to Quaternary deposits. Survey Quaternary dating methods. Proxy records of glaciation and climate change. Quaternary stratigraphy of North America, emphasizing stratigraphic records of ice sheets, glaciers, and pluvial lakes. Offered alternate years.  
**Recommended:** GEO 481 or GEO 581

GEO 495. ADVANCED FIELD GEOLOGY. (6 Credits)  
Six-week summer program in central Oregon. Collect field data to make geological maps, cross-sections, columns, and reports. Fee charged.  
**Prerequisites:** GEO 295 with C- or better and GEO 315 [C-] and GEO 340 [C-] and GEO 370 [C-]

GEO 497. FIELD MAPPING OF ORE DEPOSITS. (3 Credits)  
Eight-day field trip over spring vacation to a mineral district in the western United States, emphasizing detailed mapping of outcrops, trenches, and underground workings. Students prepare final maps and a report suitable for presentation to management or publication during spring term. Transportation fee charged. Not offered every year.  
**Recommended:** GEO 440 [C-] and GEO 495 [C-]

GEO 499. SPECIAL TOPICS. (0-16 Credits)  
**Equivalent to:** GEO 499H  
This course is repeatable for 16 credits.

GEO 500. FIELD TRIPS. (1-16 Credits)  
Participation in group field trips that are not a part of any other course. Transportation fee is charged. Students may prepare guides for trips. Faculty sponsor must be prearranged. Graded P/N.  
This course is repeatable for 48 credits.

GEO 501. RESEARCH. (1-16 Credits)  
Independent, original research subjects guided by faculty conferences and resulting in a brief written report. Faculty sponsor must be prearranged.  
This course is repeatable for 24 credits.

GEO 503. THESIS. (1-16 Credits)  
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged.  
This course is repeatable for 999 credits.

GEO 505. READING AND CONFERENCE. (1-16 Credits)  
Independent reading in specialized topics guided by and discussed in faculty conferences. Faculty sponsor must be prearranged.  
This course is repeatable for 16 credits.

GEO 507. SEMINAR. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 48 credits.

GEO 508. WORKSHOP. (1-16 Credits)  
This course is repeatable for 24 credits.

GEO 510. INTERNSHIP. (1-15 Credits)  
Pre-career professional experience under joint faculty and employer supervision. May not be used to meet minimum credit hour requirements for graduate degrees in geosciences. Graded P/N.  
This course is repeatable for 16 credits.

GEO 512. IGNEOUS PETROLOGY. (4 Credits)  
Petrogenesis of igneous rocks. Petrographic analysis using polarizing microscopes. Field trip may be required, transportation fee charged. Lec/lab.

GEO 516. INTERPRETATION OF GEOLOGIC MAPS. (3 Credits)  
Development of skills in formulating geologic problems, using geologic maps, and developing solutions by the scientific method.

GEO 518. GEOSCIENCE COMMUNICATION. (3 Credits)  
Professional development of the skills of technical editing and writing for geoscientists. Practice the craft of presentation development and delivery, and the broader issues of problem development, and manuscript and proposal writing specific to geoscience graduate students.

GEO 527. VOLCANOLOGY. (4 Credits)  
A survey of volcanoes: their distribution, forms, composition, eruptive products, eruptive styles, and associated phenomena. Field trip may be required; transportation fee charged. Offered alternate years. Lec/lab.

GEO 530. GEOCHEMISTRY. (4 Credits)  
Principles of geochemistry applied to problems of earth science. Field trip(s) may be required; transportation fees charged. Lec/rec.
GEO 531. ENVIRONMENTAL GEOCHEMISTRY. (3 Credits)
An introduction to natural processes at and near the earth's surface, as well as an examination of the impact of human activities on the natural environment. Study includes discussion of the sources, transformations, transport, and fate of contaminants. Field trip(s) required; transportation fee charged.

GEO 532. APPLIED GEOMORPHOLOGY. (3 Credits)
Effect of landform processes upon human activity; consequences of resource management strategies on erosional balance within landscape; identification of mitigation of natural hazards; role of geomorphic process studies in environmental planning. Taught as seminar, themes TBA. Field trip(s) may be required; transportation fee charged.
Equivalent to: GEOG 549

GEO 533. COASTAL GEOMORPHOLOGY. (3 Credits)
Morphodynamic approach to coastal landforms, processes and evolution including the impacts and response of humans to coastal change.

GEO 535. GEOCHEMICAL ANALYSIS TECHNIQUES. (3 Credits)
An introduction to the theory, techniques and instrumentation used for the chemical analysis of earth materials, with emphasis on analysis of solid earth material samples (predominantly, but not restricted to, rocks). Includes discussions of laboratory safety, relevant statistical approaches, basic physical and chemical principles of analysis, sample preparation techniques and data processing and reporting. Course also includes a large component of hands-on experience with instrumentation available in-house in the College of Earth, Ocean, and Atmospheric Sciences. Lec/lab.
Prerequisites: GEO 530 with C or better

GEO 536. STRUCTURAL AND NEOTECTONIC FIELD METHODS. (3 Credits)
Field-intensive mapping experience emphasizing a topical issue in active tectonics, neotectonics, earthquake geology, or structural geology. One-week field trip required; transportation fee charged. Weekly discussions during quarter. Offered alternate years.

GEO 537. TECTONIC GEOMORPHOLOGY. (3 Credits)
Exploration of linkages between patterns of erosion, crustal deformation, and landscape evolution from geomorphic, geologic, geophysical, and modeling perspectives. Field trip required; transportation fee charged. Offered alternate years.

GEO 540. ECONOMIC GEOLOGY. (4 Credits)
Principles of the origin, distribution, and importance of metallic mineral deposits formed by magmatic, hydrothermal, and sedimentary processes. Lec/lab.

GEO 550. COASTAL HAZARDS: PROCESSES, RESPONSE, AND ADAPTATION. (3 Credits)
Coastal hazards and the associated risks they pose to rapidly expanding coastal communities. Examination of coastal hazards from a trans-disciplinary perspective including the physical processes, the coastal response, and coastal adaptation/methodologies options for dealing with the hazards. Emphasizes probabilistic and other user-inspired approaches for assessing coastal vulnerability to the various hazards.

GEO 561. GEOLOGY OF EARTHQUAKES. (3 Credits)
Tectonics of the present day as based on surface geology, geodesy, seismicity, and crustal structure; description of major faults and folds; use of neotectonics in evaluation of earthquake hazard. Field trip(s) may be required; transportation fee charged. Offered alternate years.

GEO 563. GEOPHYSICS AND TECTONICS. (4 Credits)
Geophysical observations as constraints on geologic interpretation. Lec/lab.
Equivalent to: GPH 563

GEO 581. GLACIAL GEOLOGY. (4 Credits)
Mass balance of glaciers, physics of glacial flow, processes of glacial erosion and deposition, glacial meltwater, glacial isostasy and eustasy, and Quaternary stratigraphy. Field trip(s) may be required; transportation fee charged. Lec/lab. Offered alternate years.

GEO 586. QUATERNARY PALEOClimatoLOGY. (3 Credits)
Introduction to geochronology, climate proxies, climate forcing, and climate modeling applied to paleoclimatic problems. Emphasis on Quaternary climate history.

GEO 588. QUATERNARY STRATIGRAPHY OF NORTH AMERICA. (3 Credits)
Stratigraphic principles applied to Quaternary deposits. Survey Quaternary dating methods. Proxy records of glaciation and climate change. Quaternary stratigraphy of North America, emphasizing stratigraphic records of ice sheets, glaciers, and pluvial lakes. Offered alternate years.

GEO 597. FIELD MAPPING OF ORE DEPOSITS. (3 Credits)
Eight-day field trip over spring vacation to a mineral district in the western United States, emphasizing detailed mapping of outcrops, trenches, and underground workings. Students prepare final maps and a report suitable for presentation to management or publication during spring term. Transportation fee charged. Not offered every year.
Recommended: GEO 440 [C-] or GEO 540 [C-]

GEO 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 24 credits.

GEO 600. FIELD TRIPS. (1-16 Credits)
Participation in group field trips that are not part of any other course. Transportation fee charged. Students may prepare guide for trips. Faculty sponsors must be arranged. Graded P/N.
This course is repeatable for 84 credits.

GEO 601. RESEARCH. (1-16 Credits)
This course is repeatable for 36 credits.

GEO 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

GEO 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

GEO 606. PROJECTS. (1-16 Credits)
This course is repeatable for 84 credits.

GEO 607. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 48 credits.

GEO 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

GEO 622. IGNEOUS PETROLOGY. (3 Credits)
Controls on the distribution of major and trace elements; theory, applications, and examples. Field trip(s) may be required; transportation fee charged. Offered alternate years.
Recommended: GEO 412 [C-] or GEO 512 [C-]

GEO 633. GEOCHRONOLOGY AND ISOTOPE GEOLOGY. (3 Credits)
Measurements of cosmic and geologic time by radioactive decay. Use of radiogenic and stable isotopic tracers in geology. Offered alternate years.
Equivalent to: OC 633
GEO 666. STABLE ISOTYPE GEOCHEMISTRY. (3 Credits)
Study of the principles governing terrestrial stable isotope distributions, with application to geologic, oceanographic, atmospheric and planetary processes. The primary focus is on isotopes of the light elements such as oxygen, hydrogen, carbon, and sulfur, but may include other isotope systems, including Sr/Nd isotopes as geochemical tracers, noble gases, and metal isotopes (e.g. Mo, Cu, Fe).

GEO 684. GLOBAL BIOGEOCHEMICAL CYCLES. (4 Credits)
An in-depth treatment of global biogeochemical cycles, focusing on cycles of carbon, oxygen, nitrogen, phosphorus, and sulfur in the atmosphere, hydrosphere, and lithosphere. CROSSLISTED as GEO 684/ SOIL 684.
Equivalent to: SOIL 684

GEO 691. MASS AND HEAT TRANSPORT IN THE ENVIRONMENT. (4 Credits)
Quantitative treatment of processes affecting transport in lakes, streams, and groundwater: advection; diffusion; dispersion. Lec/lab. Offered alternate years.

GEO 694. TOPICS IN ORE GENESIS. (1-3 Credits)
In-depth examination of published research on selected mineral deposits to build an understanding of environments and processes of ore formation. Offered alternate years.
This course is repeatable for 6 credits.

GEO 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

German (GER)

GER 100. BASIC GERMAN. (5 Credits)
Exposes students to the basic elements of German grammar, vocabulary, speaking and listening. This course fulfills the Deficient in a Foreign Language (DFL) admission requirement. Course credits do not count towards the BA requirement in a second language, German minor, German major, German language certificate or International Degree. Taught in English.

GER 111. FIRST-YEAR GERMAN. (4 Credits)
Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111, GER 112, or GER 113. Lec/lab/rec.

GER 112. FIRST-YEAR GERMAN. (4 Credits)
Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111, GER 112, or GER 113. Lec/lab/rec.
Prerequisites: GER 111 with D- or better

GER 113. FIRST-YEAR GERMAN. (4 Credits)
Development of basic writing, reading, listening, and speaking skills; includes cultural component. Designed solely for students with no prior training in German. Native or bilingual speakers of German will not receive credit for GER 111, GER 112, or GER 113. Lec/lab/rec.
Prerequisites: GER 112 with D- or better

GER 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

GER 211. SECOND-YEAR GERMAN. (4 Credits)
Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of second-year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Native or bilingual speakers of German will not receive credit for GER 211, GER 212 or GER 213. Lec/lab/rec.
Prerequisites: GER 113 with D- or better

GER 212. SECOND-YEAR GERMAN. (4 Credits)
Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of Second-Year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Native or bilingual speakers of German will not receive credit for GER 211, GER 212, or GER 213. Lec/rec.
Prerequisites: GER 211 with D- or better

GER 213. SECOND-YEAR GERMAN. (4 Credits)
Continuing development of writing, reading, listening, and speaking skills; cultural component. Completion of Second-Year German or equivalent with a GPA of 2.50 or higher serves as a prerequisite for upper-division courses. Completion of GER 213 with grade of C- or better satisfies BA requirement in foreign languages. Native or bilingual speakers of German will not receive credit for GER 211, GER 212, or GER 213. Lec/rec.
Prerequisites: GER 212 with D- or better

GER 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

GER 311. THIRD-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. Required of German majors and minors.
Prerequisites: GER 213 with C or better

GER 312. THIRD-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. Required of German majors and minors.
Prerequisites: GER 213 with C- or better

GER 313. THIRD-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. Both courses required of German majors and minors.
Prerequisites: GER 213 with C- or better

GER 319. SELECTED TOPICS IN GERMAN LANGUAGE. (3 Credits)
Focus on development of German language skills and/or history of the language. Conducted in German. May be repeated for credit when topic varies. Lec/rec. Not offered every year.
This course is repeatable for 9 credits.

GER 329. SELECTED TOPICS IN LITERATURE AND/OR CULTURE. (3 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.

GER 331. *GERMAN CULTURE. (3 Credits)
Aspects of history, politics, art, music, literature, and everyday life in German-speaking countries. Attention to development of German language skills. Conducted in German. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: GER 213
GER 332. *GERMAN CULTURE. (3 Credits)
Aspects of history, politics, art, music, literature, and everyday life in German-speaking countries. Attention to development of German language skills. Conducted in German. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Prerequisites: GER 213 with D- or better

GER 339. SELECTED TOPICS IN GERMAN CULTURE. (3 Credits)
Focus on specific aspects of German culture. Attention to development of German language skills. Conducted in German. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.
Recommended: Completion of 9 credits from GER 311, GER 312, GER 313.

GER 349. SELECTED TOPICS IN GERMAN LITERATURE. (3 Credits)
Attention to development of German language skills. Conducted in German. May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 9 credits.
Recommended: GER 213

GER 351. GERMAN PRONUNCIATION AND PHONETICS. (3 Credits)
Analysis of the fundamentals of the German sound system, including pronunciation, phonology, phonetic and contrastive analysis of sounds; phonemes, intonation, and tone patterns. Required of students working toward a teaching certificate in German. Not offered every year.
Recommended: GER 312 with D- or better

GER 355. TRANSLATION. (3 Credits)
Introduces students to translation studies in theory and practice. Students will learn problems behind translating texts and strategies to overcome these issues, before working on shorter and longer translation projects of a variety of texts. Taught in English.
Prerequisites: GER 312 with D- or better

GER 361. CRITICAL ISSUES OF GERMAN CINEMA. (3 Credits)
Critique of current scholarly debates in German cinema (popular cinema, stars, institutional and cultural frameworks, cultural politics, and transnational connections) in connection with the critical viewing of a large variety of films from various periods. Taught in English.

GER 362. DIVIDED SCREEN: GERMAN CINEMA BETWEEN 1945 AND 1990. (3 Credits)
Introduces German cinema between the corner dates 1945–division into East and West—and German unification in 1990. Compares and contrasts films made in East and West Germany to understand differences and similarities in the political and cultural set-up of the two states.

GER 363. CONTEMPORARY GERMAN CINEMA. (3 Credits)
Introduces German cinema after unification in 1990. Analyzes German films from various genres, 'schools', and directors. Reflects and compares contemporary issues of Germany, Austria, and Switzerland to Hollywood cinema.

GER 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students, with assignments as proctors or tutors in lower-division German language courses. No more than 2 credits may be used to satisfy degree requirements for a major in German; no credit may be used to satisfy requirements for a minor in German. Graded P/N.
This course is repeatable for 6 credits.
Recommended: Completion of 12 upper-division credits in German, including GER 311, GER 312, GER 313

GER 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

GER 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

GER 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

GER 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

GER 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

GER 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

GER 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

GER 411. *FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GER 313 with C- or better

GER 412. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Prerequisites: GER 411 with C- or better

GER 413. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Prerequisites: GER 412 with C- or better

GER 421. GERMAN LANGUAGE TANDEM. (1 Credit)
Optional course that can be taken to fine-tune advanced German speaking skills with the help of a native speaker. Graded P/N.
This course is repeatable for 6 credits.

GER 449. SELECTED TOPICS IN GERMAN LITERATURE. (3 Credits)
May be repeated for credit when topic varies. Conducted in German.
This course is repeatable for 9 credits.
Recommended: 9 upper-division credits in German.

GER 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

GER 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

GER 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

GER 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

GER 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

GER 511. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Recommended: GER 313

GER 512. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Recommended: GER 411 or GER 511
GER 513. FOURTH-YEAR GERMAN. (3 Credits)
Focus on development of German writing, speaking, and listening skills. Conducted in German.
Recommended: GER 412 or GER 512

GER 549. SELECTED TOPICS IN GERMAN LITERATURE. (3 Credits)
May be repeated for credit when topic varies. Conducted in German. This course is repeatable for 9 credits.
Recommended: 9 upper-division credits in German.

Graduate Education (GRAD)

GRAD 402. INDEPENDENT STUDY. (1-16 Credits)
Lab/Field trip fee. This course is repeatable for 16 credits.

GRAD 420. GRADUATE SCHOOL PREPARATION. (1 Credit)
Applying for graduate or professional school can be a daunting task. How and where to apply, how to choose an advisor, what to look for in a school, and how to obtain funding are hurdles to overcome during the application process. Supplemental materials will be provided as part of the course materials.
Equivalent to: IST 420

GRAD 430. INTRODUCTION TO SCIENTIFIC DIVING. (4 Credits)
Incorporates academic, confined water and open water training to prepare the student to manage the task loading associated with performing scientific tasks underwater. Introduces the diver to basic techniques and equipment used in underwater data collection. Qualifies the student for acceptance into the OSU Scientific Diving Program as a Scientific Diver-in-Training, at the discretion of the DSO and OSU Diving Control Board. Includes field trips.

GRAD 499. SPECIAL TOPICS. (4 Credits)
Graduate school preparation.
Equivalent to: IST 499

GRAD 502. INDEPENDENT STUDY. (1-16 Credits)
Lab/Field trip fee. This course is repeatable for 16 credits.

GRAD 505. READING AND CONFERENCE. (1-16 Credits)
Reading and discussions on special topics. Graded P/N. This course is repeatable for 16 credits.

GRAD 506. PROJECTS. (1-16 Credits)
Graded P/N. This course is repeatable for 16 credits.

GRAD 509. PRACTICUM. (1-16 Credits)
Graded P/N. This course is repeatable for 16 credits.

GRAD 511. DESIGNING A PATH FOR SUCCESS. (1 Credit)
Graduate student learners will be oriented onto paths that will help lead them toward degree completion and success. Students will receive foundational knowledge about graduate school requirements, effective mentor/mentee relationships, financing their education, research integrity and professional conduct, innovation and commercialization, and other soft skills essential for their progress through their graduate program.
Equivalent to: WGSS 511, WGSS 512, WGSS 513

GRAD 512. CURRENT ISSUES IN HIGHER EDUCATION. (3 Credits)
Explores current, work-relevant issues in higher education nationally. Development of plan to stay current with important issues.

GRAD 513. PROFESSIONAL DEVELOPMENT IN COLLEGE AND UNIVERSITY TEACHING. (1-3 Credits)
Self-directed learning experience, providing structure and context for professional development opportunities in teaching, such as workshops, seminars, webinars, symposia, and other relevant programming. Designed to encourage and reward continuing investment in the development of knowledge and skill sets as educators. Consists of participating in self-selected teaching-related programming (in-person or online), as well as reading, writing, and reflecting on your chosen experiences. This course is repeatable for 3 credits.

GRAD 520. RESPONSIBLE CONDUCT OF RESEARCH. (2 Credits)
Careful examination of all aspects of research data management best practices. Designed to prepare students to exceed funder mandates for performance in data planning, documentation, preservation and sharing in an increasingly complex digital research environment. Open to students of all disciplines.

GRAD 521. RESEARCH DATA MANAGEMENT. (2 Credits)
Careful examination of all aspects of research data management best practices. Designed to prepare students to exceed funder mandates for performance in data planning, documentation, preservation and sharing in an increasingly complex digital research environment. Open to students of all disciplines.

GRAD 522. PREPARING AN IRB SUBMISSION. (1 Credit)
Workshop-style course resulting in applications that are ready for IRB review. Ethical issues in research will be discussed. Students will draft all submission materials outside of class and participate in the critique of each other’s protocols and consent forms. IRB approval will not be granted as part of this class. Graded P/N.

GRAD 530. INTRODUCTION TO SCIENTIFIC DIVING. (4 Credits)
Incorporates academic, confined water and open water training to prepare the student to manage the task loading associated with performing scientific tasks underwater. Introduces the diver to basic techniques and equipment used in underwater data collection. Qualifies the student for acceptance into the OSU Scientific Diving Program as a Scientific Diver-in-Training, at the discretion of the DSO and OSU Diving Control Board. Includes field trips.

GRAD 542. THE INCLUSIVE CLASSROOM: DIFFERENCE, POWER AND DISCRIMINATION. (3 Credits)
An examination of multidisciplinary scholarship on difference, power, and discrimination; critical pedagogies; and curriculum transformation. Discussions of theory and research are coupled with practical hands-on opportunities for students to develop and hone their teaching and course development skills. CROSSTLISTED as GRAD 542/WGSS 542.
Equivalent to: WGSS 542

GRAD 550. INTRODUCTION TO ONLINE COURSE DEVELOPMENT AND FACILITATION. (2 Credits)
Prepares students to develop and teach distance courses. Students explore practical aspects of course development and facilitation: a brief history of distance education and pedagogical theory; course design principles; engagement of adult learners; active learning; and investigation of how online instruction, in addition to offering flexibility and convenience, also offers distinct pedagogical benefits. Open to students in all disciplines.
**Graphic Design (GD)**

**GD 110. GRAPHIC DESIGN TOOLS AND TECHNIQUES. (4 Credits)**
A foundation-level course covering software skills and production techniques aimed at building a confident understanding and demonstration of the tools of design, making, craft, and delivery.

**GD 121. ADOBE SOFTWARE BASICS. (3 Credits)**
Instruction in drawing, editing, and layout techniques using Adobe Illustrator, and Photoshop CS6 and CC.
Equivalent to: DHE 121

**GD 126. GRAPHIC DESIGN PRO APPLICATION. (2 Credits)**
Required pre-graphic design course. Course will focus on the development of a final portfolio to be reviewed by the graphic design faculty at the end of the spring term. Lec/lab/studio.
Prerequisites: ART 101 with C- or better and ART 115 [C-] and ART 121 [C-] and ART 131 [C-]
Recommended: ART 120 and ART 122 and DHE 121

**GD 200. GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 1. (4 Credits)**
A second year level course (2 series) covering software skills and production techniques aimed at building a confident understanding and demonstration of the tools of design, making, craft, and delivery.

**GD 220. GRAPHIC DESIGN TECHNOLOGY AND PRODUCTION 2. (4 Credits)**
A second-year level course (2 series) covering software skills and production techniques aimed at building a confident understanding and demonstration of the tools of design, making, craft, and delivery.
Prerequisites: GD 200 with C- or better

**GD 224. INTERACTIVE DESIGN 1. (4 Credits)**
Introductory class to interactive design principles in the graphic design professional core.
Prerequisites: GD 126 with C- or better and GD 226 (may be taken concurrently) [C-] and GD 228 (may be taken concurrently) [C-]

**GD 226. TYPOGRAPHY 1. (4 Credits)**
An introductory course in the discipline, function and tradition of typography as it relates to visual and verbal communication.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 226

**GD 228. PROCESS: MAKING AND MEANING. (4 Credits)**
Course utilizes creative problem solving techniques, communication theories, combined with media explorations to bring together message, meaning, medium, and form.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 228

**GD 230. GRAPHIC DESIGN PROFESSIONAL DEVELOPMENT. (2 Credits)**
A required professional development course for graphic design sophomores aimed at preparing and empowering students to navigate professional opportunities ‘as students’. This course is a prerequisite for GD 430 Graphic Design Practicum.

**GD 269. GRAPHIC DESIGN HISTORY. (3 Credits)**
A historical and theoretical overview of the evolution and innovations in graphic design.
Prerequisites: GD 126 with D- or better
Equivalent to: GD 369
GD 300. GRAPHIC DESIGN ADVANCED TOOLS AND TECHNIQUES II. (4 Credits)
An intermediate technology course covering software skills and production techniques for interactive and motion delivery, aimed at building a confident understanding and demonstration of the industry standard tools of interactive and time-based design.
Prerequisites: GD 210 with C- or better

GD 312. *CONTEMPORARY ISSUES IN DESIGN. (3 Credits)
For all graphic design students in the professional graphic design program. The course examines contemporary design issues through reading, research, writing, presentations and discussion. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: GD 126 with D- or better
Equivalent to: GD 412

GD 325. GRAPHIC DESIGN: COLLABORATIVE PROCESSES. (4 Credits)
Intermediate course in graphic design. Emphasis on collaborative projects exploring principles of group problem solving in typography.
Equivalent to: ART 325

GD 326. TYPOGRAPHY 2. (4 Credits)
An intermediate course exploring the design of organizational typographic structures and systems.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 326

GD 327. TYPOGRAPHY 3. (4 Credits)
An intermediate course exploring the visual, expressive vocabulary of typography, using innovative experimentation.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 327

GD 328. INTERACTIVE 2. (4 Credits)
An introduction to the contemporary issues of interactive design: experience design, application design, e-publication design, and from a visual communications perspective.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 328

GD 330. GRAPHIC DESIGN AND SUSTAINABILITY. (4 Credits)
An in-depth and hands-on exploration of the strategies, frameworks, and problem solving skills required for a sustainable and regenerative graphic design practice. Focus is on applying perspectives and systems thinking skills to design projects in the real world.
Prerequisites: GD 210 with C- or better

GD 355. THE PHOTOGRAPHIC BOOK. (4 Credits)
Practical studio course focusing on the photographic book in all of its forms. Use appropriated imagery as well as original imagery to create a variety of zines as well as soft and hardcover photo-books. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. CROSSLISTED as ART 355/ GD 355.
Prerequisites: ART 263 with C- or better
Equivalent to: ART 355

GD 369. GRAPHIC DESIGN HISTORY. (3 Credits)
An intermediate lecture course providing a historical and theoretical overview of the evolution and innovation in graphic design.
Equivalent to: ART 369, GD 269
Recommended: ART 204 and ART 205 and ART 206 and ART 367

GD 412. *CONTEMPORARY ISSUES IN DESIGN. (3 Credits)
How contemporary culture shapes the practice of graphic design and how design shapes the culture in which we live. Issues examined through lectures, readings, discussion and writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ART 412

GD 419. PORTFOLIO REVIEW. (3 Credits)
A course to advise students during their final portfolio preparation. The objective is to complete the portfolio and hone presentation skills and techniques.
Prerequisites: GD 420 with C- or better
Equivalent to: ART 419

GD 420. PROFESSIONAL PRACTICES. (3 Credits)
Professional ethics and standards, business practices and tactics, and pre-press production techniques and concerns for graphic designers.
Prerequisites: GD 126 with D- or better
Equivalent to: ART 420

GD 421. INFORMATION AND PUBLICATION DESIGN. (4 Credits)
Theoretical and historical issues of organizing and visualizing statistics, numbers, and/or complex relationships. Emphasis on conceptualization, visual diagramming, and analysis of subtle visual relationships.
Equivalent to: ART 421

GD 422. NEW MEDIA: INTERACTIVE. (4 Credits)
An advanced course designing digital experiences with emphasis on innovative navigation, architectural structures, theoretical, and historical issues of new media.
Recommended: Junior block in graphic design and CS 295.

GD 423. EXPERIMENTAL TYPOGRAPHY. (4 Credits)
An advanced course in experimental typography focusing on intent, meaning, and method.
Equivalent to: ART 423

GD 424. BRAND IDENTITY SYSTEMS. (4 Credits)
Studio course that explores both the theory and the practice of brand identity systems, through the creation of a comprehensive visual branding project.
Prerequisites: GD 126 with C- or better
Equivalent to: ART 424
This course is repeatable for 12 credits.

GD 426. GRAPHIC DESIGN CAPSTONE 1. (3 Credits)
The first in a two-course sequence of senior-level graphic design capstone courses. The focus is on applying more in-depth design research methods to graphic design senior capstone projects.

GD 427. CAPSTONE 2. (4 Credits)
The second in a two-course sequence of senior-level graphic design capstone courses. The focus is on the design and development of the senior capstone project.
Prerequisites: GD 126 with C- or better and GD 426 [C-]
Equivalent to: GD 428

GD 429. GRAPHIC DESIGN STUDIO. (4 Credits)
Provides opportunity for students to work with clients on actual projects in a professional environment. Lec/lab.
Equivalent to: ART 429
This course is repeatable for 16 credits.
GD 430. GRAPHIC DESIGN PRACTICUM. (2 Credits)
Works from the skills and lessons learned in GD 230, Professional Development, to provide a system of evaluation and reflection in a structured class environment for students in a graphic design internship or project-based practicum.
Prerequisites: GD 230 with C- or better
This course is repeatable for 8 credits.

GD 455. THE PHOTOGRAPHIC BOOK II. (4 Credits)
Practical studio course focusing on advanced practices and techniques in relation to the photographic book. Use appropriated imagery as well as original imagery to complete well-developed book projects. Structure, form, materials, and layout will be discussed as well as content, sequencing, and physical construction. Advanced elements such as application of blanking, slip cases, screen printing, and other construction techniques will be taught. CROSSLISTED as ART 455/GD 455.
Prerequisites: ART 355 with C- or better
Equivalent to: ART 455

GD 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Health and Human Sciences (HHS)

HHS 001. SERVICE LEARNING. (0 Credits)
Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.
HHS 002. LEADERSHIP. (0 Credits)
Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

HHS 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

HHS 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 231. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness
Equivalent to: HHP 231, HHS 231H

HHS 231H. *LIFETIME FITNESS FOR HEALTH. (2 Credits)
Provides up-to-date and relevant health and wellness information; practical strategies to implement positive behavior change in physical activity, nutrition, and stress management throughout college and the lifespan. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness; HNRS – Honors Course Designator
Equivalent to: HHS 231

HHS 241. *LIFETIME FITNESS. (1 Credit)
Assessment, evaluation and practice of physical fitness and health behaviors leading to the development of a personal fitness program. (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness

HHS 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 18 credits.

HHS 440. GLOBAL NUTRITION. (3 Credits)
Examines causes and consequences of nutritional problems including malnutrition, both under- and overnutrition, that impact health, developmental capacity, and economic well-being of populations in developing societies. Explores policies, practices, and cultural approaches to improving nutritional status at the household, local and international levels.

HHS 513. INTEGRATED APPROACH TO PUBLIC HEALTH I. (6 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health. This course is the first of a two-part course sequence.

HHS 514. INTEGRATED APPROACH TO PUBLIC HEALTH II. (6 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health; public health and health care systems; planning and management to promote health; and policy in public health. This course is the second of a two part course sequence.
Prerequisites: HHS 513 with B- or better

HHS 517. CASE STUDIES IN PUBLIC HEALTH PRACTICE. (3 Credits)
Case-based learning to illustrate the complexity of public health issues and to demonstrate the need for integrated approaches for developing and implementing successful strategies in public health practice. Students will apply a wide range of knowledge and skills essential to public health practice that relate to outbreak investigation, policy analysis, regulatory decision-making, ethics, program development, program evaluation, research synthesis, screening programs, working with stakeholders, health risk communication, and disaster preparedness.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 526. LINEAR REGRESSION IN PUBLIC HEALTH. (2 Credits)
Biostatistical tools for scientific applications in public health using linear regression analysis. Confounding, effect modification, variable selection, assessing model fit, observational studies, and exploratory data analysis. Emphasis on the use of statistical packages for analyzing public health data.
Prerequisites: H 524 with B- or better
This course is repeatable for 4 credits.
HHS 527. LOGISTIC REGRESSION IN PUBLIC HEALTH. (2 Credits)
Biostatistical tools for scientific applications in public health using logistic regression analysis. Confounding, effect modification, variable selection, assessing model fit, exploratory data analysis, and observational studies. Emphasis on the use of statistical packages for analyzing public health data.
Prerequisites: H 524 with B- or better

HHS 537. EVIDENCE-BASED LEADERSHIP IN PUBLIC HEALTH. (3 Credits)
Examines how collaboration differs from working together, and offer opportunities to develop skills for successful and effective group functioning. Students will be challenged to examine personal strengths (and the strengths of others) as they relate to leadership and followership. Explores evidence-based management – identifying and using organizational and scientific data in decision making.
Prerequisites: H 536 with B- or better

HHS 540. GLOBAL NUTRITION. (3 Credits)
Examines causes and consequences of nutritional problems including malnutrition, both under- and overnutrition, that impact health, developmental capacity, and economic well-being of populations in developing societies. Explores policies, practices, and cultural approaches to improving nutritional status at the household, local and international levels.

HHS 541. PUBLIC HEALTH PERSPECTIVE ON GLOBAL FOOD SECURITY. (3 Credits)
Explore food insecurity and hunger in the U.S. and global contexts, including examination of the causes, correlates, and consequences of hunger and community, national, and international food safety nets.

HHS 550. COMMUNICATING FOR PUBLIC HEALTH POLICY IMPACT. (3 Credits)
Successful public health professionals communicate clearly and in compelling ways with non-scientific audiences. In this hands-on course, the theory and practice of effective public health communication will be explored, with a focus on advancing a public health policy. Through a selected public health policy topic, students will develop and enhance skills in planning and implementing impactful public health communications, including message development, data visualization, media interviewing, engaging through social media and presenting to policymakers. Professionals in the field, including those in legislative and media roles, will share examples of effective communication and provide constructive feedback on students’ work.

HHS 578. EVIDENCE-BASED PUBLIC HEALTH I. (3 Credits)
Evidence-based public health is the process of integrating science-based interventions with community preferences to improve the health of populations. This is the first in a two-course series and provides theoretical and practical bases to identify, implement and evaluate evidence-based research (i.e. programs, surveillance, policies). Students will develop skills to select and adapt evidence-based public health programming for a specific community and/or population.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 579. EVIDENCE-BASED PUBLIC HEALTH II. (3 Credits)
Evidence-based public health is the process of integrating science-based interventions with community preferences to improve the health of populations. This is the second in a two-course series. Applies science and adaptation frameworks learned in the first course to the development of a program plan. Provides instruction and application of program planning and program evaluation frameworks. Course learning is synthesized through the development of a grant proposal for adapted public-health program plus evaluation plan.
Prerequisites: H 575 with B- or better and HHS 578 [B-]

HHS 580. GRANT WRITING FOR PUBLIC HEALTH PRACTITIONERS. (4 Credits)
Provides an introduction to principles of grant writing, with an emphasis on grants seeking funding from national, regional, or local entities (e.g., CDC, foundations) that support research and program that aim to improve community health through health promotion. There will be a focus on grants that MPH-level practitioners seek to conduct research, enhance practice, and/or support delivery of programs within communities. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a grant proposal.
Prerequisites: H 515 with C- or better and H 575 [C] and H 576 [C-]

HHS 584. SURVEILLANCE AND FIELD EPIDEMIOLOGY FOR PUBLIC HEALTH. (3 Credits)
A review of public health surveillance systems, and the continuum of communicable disease surveillance into field epidemiology and other responses to identified events.
Prerequisites: H 524 with B- or better or HHS 514 with B- or better

HHS 590. PUBLIC HEALTH LAW. (2 Credits)
Explores the use of law and policy tools to promote access to health and healthy living conditions. Examines the legal powers and duties of government at the federal, state, and local levels to ensure the conditions required for people to be healthy. Discussion of individual rights as limitations on the power of the government to act in furtherance of public health goals.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

HHS 597. GLOBAL HEALTH SYSTEMS. (3 Credits)
Explores key components of global health systems, using case studies of institutions, processes, and health outcomes.

HHS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HHS 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Hebrew (HEBR)

HEBR 111. INTRODUCTION TO HEBREW. (4 Credits)
Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with no prior training in Hebrew. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 111, HEBR 112, HEBR 113.

HEBR 112. INTERMEDIATE HEBREW. (4 Credits)
Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with prior training in Hebrew. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 111, HEBR 112, HEBR 113.
Prerequisites: HEBR 111 with D- or better

HEBR 113. INTERMEDIATE HEBREW II. (4 Credits)
Pronunciation, grammar, reading, writing, listening comprehension, speaking, conversation. Designed specifically for students with prior training in Hebrew. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 111, HEBR 112, HEBR 113.
Prerequisites: HEBR 111 with D- or better and HEBR 112 [D-]

HEBR 211. SECOND-YEAR HEBREW I. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 211. Taught via Ecampus only.
Prerequisites: HEBR 113 with D- or better
HEBR 212. SECOND-YEAR HEBREW II. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 211, HEBR 212, HERB 213. Taught via Ecampus only.
Prerequisites: HEBR 211 with D- or better

HEBR 213. SECOND-YEAR HEBREW III. (4 Credits)
Continued development of basic language skills, pronunciation, and vocabulary acquisition; introduction to extensive reading. Native and/or bilingual speakers of Hebrew will not receive credit for HEBR 211, HEBR 212, HEBR 213.
Prerequisites: HEBR 212 with D or better

History (HST)

HST 101. *HISTORY OF WESTERN CIVILIZATION. (4 Credits)
Provides an awareness and understanding of the Western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the Western tradition. Covers the Ancient World to 1000 A.D. HST 101, HST 102 and HST 103 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 101H

HST 102. *HISTORY OF WESTERN CIVILIZATION. (4 Credits)
Provides an awareness and understanding of the Western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the Western tradition. Covers 1000 A.D. to 1789. HST 101, HST 102 and HST 103 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 102H

HST 103. *HISTORY OF WESTERN CIVILIZATION. (4 Credits)
Provides an awareness and understanding of the Western cultural heritage. Stresses the major ideas and developments that have been of primary importance in shaping the Western tradition. Covers 1789 to the present. HST 101, HST 102 and HST 103 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 103H

HST 104. *WORLD HISTORY I: ANCIENT CIVILIZATIONS. (3 Credits)
A survey of the historical development of several world civilizations from antiquity to roughly 600 to 700 A.D. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: HST 201H

HST 105. *WORLD HISTORY II: MIDDLE AND EARLY MODERN AGES. (3 Credits)
A survey of the historical development of several world civilizations roughly from the 8th century to the late 18th century. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 105H

HST 106. *WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD. (3 Credits)
A survey of the historical development of several world civilizations from the 18th century to the contemporary period. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: HST 106H

HST 106H. *WORLD HISTORY III: THE MODERN AND CONTEMPORARY WORLD. (3 Credits)
A survey of the historical development of several world civilizations from the 18th century to the contemporary period. Exploration of religious, cultural, social, political, and economic institutions of various societies. Cultural diversity analysis of both ancient Western and non-Western civilizations. Not offered every year. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 106

HST 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

HST 201. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers pre-Columbian and colonial origins to 1820. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 201H
HST 201H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers pre-Columbian and colonial origins to 1820. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 201
HST 202. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1820 to 1920. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 202H
HST 202H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1820 to 1920. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 202
HST 203. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1920 to present. HST 201, HST 202, HST 203 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 202H
HST 203H. *HISTORY OF THE UNITED STATES. (4 Credits)
Provides an overview of the development of the U.S. from the pre-Columbian era to the present. Attention is given to economic, political, and social trends, as well as to international relations. Covers 1920 to present. HST 202H and HST 203H need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 203
HST 210. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: HST 210H, PHL 210, PHL 210H, REL 210
HST 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, PHL 210, PHL 210H, REL 210, REL 210H
HST 215. *INTRODUCTION TO JEWISH TRADITIONS. (4 Credits)
An introduction to Judaism's traditions, histories, and practices. Covers historical origins and developments from the biblical period through the Middle Ages, and considers Judaism in the modern world. Topics include the Jewish calendar (including holidays and their traditions), Jewish life cycle events, Jewish prayer, and traditional texts such as the Mishnah and Talmud. CROSSLISTED as HST 215/REL 215. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: REL 215
HST 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
HST 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HST 299
This course is repeatable for 16 credits.
HST 310. THE HISTORIAN'S CRAFT. (4 Credits)
A study of the practice as well as theory of historical work. Combines training in reading, writing, and thinking historically with a survey of the development of history, philosophies of history, types and use of historical evidence, varieties of historical investigation, and factors that influence the writing of history. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 420
Recommended: 9 credits of history or upper-division standing.
HST 315. THE EUROPEAN MILITARY, 1400-1815. (4 Credits)
Major aspects of European military history, 1400-1815, notable developments in weaponry and strategy, the social history of the military, impact of war on the civilian front, and pacifism and antimilitarism. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
HST 316. THE AMERICAN MILITARY, 1607-1865. (4 Credits)
Major aspects of American military history, 1607-1865, notable developments in weaponry and strategy, the social history of the military, impact of war on the civilian front, and pacifism and antimilitarism. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
HST 317. *WHY WAR: A HISTORICAL PERSPECTIVE. (4 Credits)
An inquiry into the origins of mass violence. Theory and case studies are used to suggest possible causes of international war, civil war, revolution, and genocide. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 317H
HST 317H. *WHY WAR: A HISTORICAL PERSPECTIVE. (4 Credits)
An inquiry into the origins of mass violence. Theory and case studies are used to suggest possible causes of international war, civil war, revolution, and genocide. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 317

HST 318. THE AMERICAN MILITARY, 1865-PRESENT. (4 Credits)
Major aspects of American military history, 1865-present: evolution of strategy, tactics, and technology in war; the impact of the military on American society in peace and war; historiographic aspects of U.S. military history. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 319. *THE HISTORY OF HUMAN RIGHTS IN THE MODERN WORLD. (4 Credits)
Historical examination of the articulations, development, and enforcement of human rights in a global context since the 1770s. Particular attention devoted to nineteenth-century transnational humanitarian missions, wartime codes of conduct, international wars crimes tribunals, European imperialism and decolonization, twentieth-century genocides, the International Criminal Court, the United Nations’ “Universal Declaration of Human Rights” (UDHR), and the legacy of the UDHR. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

HST 320. *ANCIENT NEAR EAST. (4 Credits)
A detailed survey of the peoples and cultures of the ancient Near East, including Assyria, Babylon, Egypt, Israel, Mesopotamia, and Persia, from the earliest recorded beginnings of civilization to about 500 B.C. Particular attention is given to the art, religion, law, and literature of these civilizations. (H) (NC) (Bacc Core Course)
Attributes: CPSC – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LANC – Liberal Arts Non-Western Core

HST 321. GREECE. (4 Credits)
The history of the Greek city-states and the civilization they produced; the archaeological discovery of early Greece; the development of the polis; Sparta, Athenian democracy, the Persian and Peloponnesian Wars; Greek private life and religion. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 322. ROMAN REPUBLIC. (4 Credits)
The rise of Rome from a city-state to a world power, Rome’s wars with Carthage, her growing domination of the Mediterranean, the ensuing breakdown of Roman society and traditional values, and the rise of ambitious leaders who ultimately destroyed the Republic. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 323. ROMAN EMPIRE. (4 Credits)
Roman history from 31 B.C. to A.D. 493. The establishment of the Principate, Roman social and private life, the rise of Christianity, the decline and fall of the Western Empire, Rome’s contributions to arts, religion, and law. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 324. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPSC – Core, Pers, Cult Diversity
Equivalent to: HST 324H, REL 324, REL 324H

HST 324H. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPSC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: HST 324, REL 324, REL 324H

HST 325. *EARLY CHRISTIANITY: ORIGINS TO 600. (4 Credits)
Traces early Christianity from its origins to the beginning of the Middle Ages. It deals with the origins and Jewish background of Christianity in Palestine, the ministry and teachings of Jesus, the spread of Christianity throughout the Roman Empire by his disciples and early missionaries, the formation of the Church, the development of Christian doctrine, controversies over heresy, and the role of monasticism and the Papacy. CROSSLISTED as HST 325/REL 325. (Bacc Core Course)
Attributes: CPSC – Core, Pers, West Culture
Equivalent to: REL 325

HST 326. *HISTORY OF CHRISTIANITY. (4 Credits)
Examines the history of global Christianity from the fifth through the seventeenth centuries. Themes to be investigated include the evolving relationship between the church and the state; mysticism; conversion and resistance; the emergence of Protestantism; marriage and sex, as well as women in the history of Christianity. CROSSLISTED as HST 326/REL 326.
Attributes: CPSC – Core, Pers, West Culture
Equivalent to: REL 326

HST 327. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 284 A.D. to 1000. Not offered every year. CROSSLISTED as HST 327/REL 327. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 327

HST 328. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 1000 to 1400. Not offered every year. CROSSLISTED as HST 328/REL 328. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 328

HST 329. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the Renaissance. HST 329, HST 330, and HST 331 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 330. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the Reformation. Not offered every year. CROSSLISTED as HST 330/REL 330. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 330

HST 331. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the scientific revolution. HST 329, HST 330, and HST 331 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
HST 333. MEDIEVAL AND EARLY MODERN SPANISH HISTORY. (4 Credits)
From Islamic conquest to conquest of America, the social, religious, political and economic history of Spain from 1000 to 1700. Offered fall term in odd years. CROSSLISTED as HST 333/REL 333. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 333

HST 335. *NINETEENTH-CENTURY EUROPE. (4 Credits)
A thematic overview of the 'long' nineteenth century, from the French Revolution (1789) to the outbreak of the first World War (1914): the industrial revolution and the class struggles that accompanied it; the growing importance of the nation in politics and culture; imperial expansion and Europeans' contacts with non-Europeans; urbanization; Darwinism and Social Darwinism; and the developments leading to the cataclysm of Europe's first 'modern' war. Not offered every year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

HST 336. TWENTIETH-CENTURY EUROPE. (4 Credits)
Examines the politics, culture, and society of Europe from World War I to the present. Themes include total war; ways that art and literature influenced politics; communist and fascist visions of the relationship of the individual to the society or collective; racial theories and genocide; the cold war division of Europe into East and West; decolonization; and the development of the European Community. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 338. *HITLER'S EUROPE. (4 Credits)
Examines WWII and Nazi Germany's efforts to construct an empire. Themes include: the Nazi Party's rise to power in 1933 and pursuit of war, battles and occupation policies in Western and Eastern Europe, anti-Semitism and the concept of Lebensraum, collaboration among occupied peoples and Germans, and the Holocaust. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

HST 340. HISTORY OF RUSSIA. (4 Credits)
Survey of political, economic, and social developments from the origin of Russia to the post-Soviet period. Focuses on the period from 862 to 1917. Not offered every year. HST 340 and HST 341 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 440, HST 540

HST 341. HISTORY OF RUSSIA. (4 Credits)
Survey of political, economic, and social developments from the origin of Russia to the post-Soviet period. Focuses on the period from 1917 to the present. Not offered every year. HST 340 and HST 341 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 441, HST 541

HST 344. SPECIAL TOPICS IN RUSSIAN HISTORY. (4 Credits)
Special topics and problems in Russian history not covered in other courses. May be repeated when topic varies. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 345. SOCIETY IN MODERN RUSSIA. (4 Credits)
Development of Russian/Soviet/Post-Soviet society since 1861, focusing on gender, urbanization, and the general social ramifications of modernization. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 445, HST 545

HST 348. *INDIGENOUS HISTORY OF LATIN AMERICA. (4 Credits)
Dedicated to studying the indigenous histories of Mexico, Central, and South America from 2000 BCE to 1600 CE through their own voices with an emphasis on religion, gender, and society. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 350. *MODERN LATIN AMERICA. (4 Credits)
History of Latin America leading up to and after Spanish and Portuguese conquest. Focus on indigenous American, European and African cultures and religions in contact under colonial government and economic systems. Covers the period from 1400 to 1810. CROSSLISTED as HST 350/REL 350. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 350H, REL 350

HST 351. *MODERN LATIN AMERICA. (4 Credits)
History of the development of Latin America, emphasizing the issues of imperialism, economic dependency, social stratification, political instability, and nationalism within an international context. Covers 1850 to the present. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 352. *AFRICANS IN LATIN AMERICAN HISTORY. (4 Credits)
A survey of the role of Africans and their descendants in Latin American history, linking the history of the Americas, Europe and Africa. CROSSLISTED as HST 352/REL 352. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 353. *SLAVERY IN THE AMERICAS. (4 Credits)
A survey of the roles of Africans and their descendants in the history of the Atlantic World, linking Europe, Africa, and the Americas. Examines slavery and freedom in the African Diaspora, as well as social, cultural, and spiritual life. CROSSLISTED as HST 353/REL 353. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 362. WOMEN IN UNITED STATES HISTORY. (4 Credits)
Women in the United States—their roles in and contribution to American political, economic, social, cultural, and intellectual life. Course sequence pays particular attention to the diversity of American women's backgrounds and experiences. Covers 1620 to 1890. Not offered every year. HST 362 and HST 363 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
HST 363. WOMEN IN UNITED STATES HISTORY. (4 Credits)
Women in the United States—their roles in and contribution to American political, economic, social, cultural, and intellectual life. Course sequence pays particular attention to the diversity of American women's backgrounds and experiences. Covers 1890 to the present. Not offered every year. HST 362 and HST 363 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 364. *UNITED STATES RELIGION AND SOCIAL REFORM. (4 Credits)
Provides an awareness of how various religious groups have thought about and engaged with social change pertaining to slavery, feminism, civil rights, same-sex marriage, and immigration. Focus on reading primary sources related to each of these issues. CROS LisTed as HST 364/REL 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: REL 364

HST 365. *THE CIVIL RIGHTS MOVEMENT IN THE MODERN U.S.. (4 Credits)
An exploration of the 'long civil rights movement' among African Americans and their allies during the 20th century United States, with attention to the structure of racial inequality, movement philosophies and strategies, white allies and opponents, relationships to other freedom movements, and the movement's legacies. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 365H

HST 365H. *THE CIVIL RIGHTS MOVEMENT IN THE MODERN U.S.. (4 Credits)
An exploration of the 'long civil rights movement' among African Americans and their allies during the 20th century United States, with attention to the structure of racial inequality, movement philosophies and strategies, white allies and opponents, relationships to other freedom movements, and the movement's legacies. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

HST 366. *NATIVE NORTH AMERICA. (4 Credits)
Explores the history, culture, and representation of various Native American groups from the pre-Columbian era to the twenty-first century. Through a range of interdisciplinary readings and media, students will explore themes like the construction and maintenance of cultural identity, politics and warfare between indigenous groups and European or American interlopers, the influence of Native economies, and Native groups' persistence in American life amidst ongoing economic and demographic change. (Bacc Core Course) (H)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

HST 368. *LESBIAN AND GAY MOVEMENTS IN MODERN AMERICA. (4 Credits)
Examination of lesbian and gay male identities, lives, and collectivities in American culture from the post-Civil War period to the present. The political and cultural participation, rather than human sexual behaviors, orientations, or values. Not offered every year. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACH – Liberal Arts Humanities Core

HST 369. **IMMIGRATION TO THE U.S. SINCE 1880. (4 Credits)
The history of immigrants to the U.S. after 1880. Focuses on the experience of immigrants and their children in the U.S. and on the history of U.S. immigration policy. Includes several types of writing assignments: nongraded, drafts and revisions, and a research paper using outside primary and secondary sources and scholarly notations specific to the discipline of history. HST 369 satisfies WIC requirement for Liberal Studies majors but not History majors. (Baccalaureate Core Course) (Writing Intensive Course) Taught via Ecampus only.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CWIC – Core, Skills, WIC

HST 370. *SOCIAL CHANGE AND AMERICAN POPULAR MUSIC. (4 Credits)
An examination of the interactions between social history and popular music, including creation, performance, production, distribution, and reception. Social, ethnic, and economics groups have notoriously used popular music to identify themselves and their boundaries. This course examines how the functions of popular music in our culture and economy have changed over time, and the ways in which popular music reflects and sometimes helps precipitate social change. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

HST 375. *GLOBAL HISTORY OF SPORTS. (4 Credits)
Historical and contemporary examination of the ties between global sports and politics, economy, culture, and society. Particular attention devoted to the development of various sports and their modern articulation. Among other, the course deals with these crucial questions: How is 'sports' defined? What led to the development of different sports in different places throughout the world? How are global sports institutions influencing our lives? What are the changes witnessed in consuming sports in the last half a century? How can sports tackle institutionalized racism, but also promote nefarious practices, chauvinism, and exclusion based on ethnicity or religion?
Attributes: CSGI – Core, Synth, Global Issues

HST 376. RELIGION AND GENDER: A GLOBAL PERSPECTIVE. (4 Credits)
Introduces students to the academic study of religion, as well as the academic study of gender. In order to offer a global perspective, we will read a series of case studies that deal with the religion as a gendered experience. Students will produce two essays, one of which will be based on independent research. CROS LisTed as HST 378/REL 378/ WGSS 378. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: REL 378, WGSS 378

HST 381. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Africa before 1830. HST 381 and HST 382 need not be taken in sequence. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 382. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Nineteenth and Twentieth century Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 382H
HST 382H. *HISTORY OF AFRICA. (4 Credits)
History of Africa from earliest times to present, including origins of human society, slave trade, European imperialism and African nationalism. Covers Nineteenth and Twentieth century Africa. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 382

HST 385. *THE ARAB-ISRAELI CONFLICT. (4 Credits)
Examination of the origins of the Arab-Israeli conflict and subsequent efforts to find a lasting solution. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 385H

HST 386. *MODERN IRAN: REVOLUTION AND ITS AFTERMATH. (4 Credits)
The history of 20th century Iran with a focus on the Islamic revolution and its consequences. Readings will provide the cultural and political background for understanding contemporary Iran and its place in the world. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HST 386

HST 386H. *MODERN IRAN: REVOLUTION AND ITS AFTERMATH. (4 Credits)
The history of 20th century Iran with a focus on the Islamic revolution and its consequences. Readings will provide the cultural and political background for understanding contemporary Iran and its place in the world. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 386H

HST 387. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 600 to 1400. Early history and the formation of Islamic society to the Mongol invasion. CROSSLISTED as HST 387/REL 387. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: REL 387

HST 388. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 1400 to the present. The expansion of Islam, Turckic, and Asian dynasties, impact of Western imperialism and modern Islamic world. CROSSLISTED as HST 388/REL 388. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: REL 388

HST 389. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: HST 399H
This course is repeatable for 16 credits.

HST 390. *MIDEAST WOMEN: IN THEIR OWN WORDS. (4 Credits)
The lives of modern Middle Eastern women as told in memoirs, autobiography and film. First-person narratives and film portrayals provide the means for understanding historical events and contemporary trends in the region. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HST 390H

HST 390H. *MIDEAST WOMEN: IN THEIR OWN WORDS. (4 Credits)
The lives of modern Middle Eastern women as told in memoirs, autobiography and film. First-person narratives and film portrayals provide the means for understanding historical events and contemporary trends in the region. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HST 390

HST 391. *TRADITIONAL CHINA AND JAPAN. (4 Credits)
Prehistory to Western encounters in the middle of the nineteenth century, with emphasis on the philosophical, artistic heritage, and social institutions of these two countries which form East Asia. HST 391 and HST 392 need not be taken in sequence. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 392. *MODERN CHINA AND JAPAN. (4 Credits)
From the opening of East Asia in the mid-nineteenth century to the present, with emphasis on modern political movements and cultural transformation. HST 391 and HST 392 need not be taken in sequence. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core

HST 396. *GENDER, FAMILY AND POLITICS IN TRADITIONAL CHINA. (4 Credits)
Study of the interaction between gender, family and politics as major factors shaping traditional Chinese experience. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 397. *GENDER, FAMILY AND POLITICS IN MODERN CHINA. (4 Credits)
Study of the interaction between gender, family and politics as three factors shaping modern Chinese experience. Elective for history majors. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

HST 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HST 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HST 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HST 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Requirements</th>
<th>Attributes</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>HST 407</td>
<td>*SEMINAR. (5 Credits)</td>
<td></td>
<td>(Writing Intensive Course)</td>
<td><strong>Attributes:</strong> CWIC – Core, Skills, WIC&lt;br&gt;<strong>Equivalent to:</strong> HST 407H &lt;br&gt;<strong>This course is repeatable for 20 credits.</strong></td>
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<td><strong>Attributes:</strong> CWIC – Core, Skills, WIC; HNRS – Honors Course Designator&lt;br&gt;<strong>Equivalent to:</strong> HST 407 &lt;br&gt;<strong>This course is repeatable for 20 credits.</strong></td>
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<td>HST 410</td>
<td>HISTORY INTERNSHIP. (1-12 Credits)</td>
<td></td>
<td>Supervised work of a historical nature with historical societies, archives, museums, or other public or private organizations. No more than 6 of the maximum 12 credits may be used to satisfy the history major requirement of 51 credits. &lt;br&gt;<strong>This course is repeatable for 12 credits.</strong></td>
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<td>HST 415</td>
<td>SELECTED TOPICS. (4 Credits)</td>
<td></td>
<td>Selected topics of special or current interest not covered in other courses. (H)</td>
<td><strong>Attributes:</strong> LACH – Liberal Arts Humanities Core&lt;br&gt;<strong>Equivalent to:</strong> HST 415H &lt;br&gt;<strong>This course is repeatable for 99 credits.</strong></td>
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<tr>
<td>HST 415H</td>
<td>SELECTED TOPICS. (4 Credits)</td>
<td></td>
<td>Selected topics of special or current interest not covered in other courses. (H)</td>
<td><strong>Attributes:</strong> HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core&lt;br&gt;<strong>Equivalent to:</strong> HST 415 &lt;br&gt;<strong>This course is repeatable for 99 credits.</strong></td>
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<tr>
<td>HST 416</td>
<td>FOOD IN WORLD HISTORY. (4 Credits)</td>
<td></td>
<td>Historical analysis of food and cooking from pre-history to the present, with an emphasis on cross-cultural differences of food production and consumption. (Bacc Core Course) (H)</td>
<td><strong>Attributes:</strong> CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core</td>
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<tr>
<td>HST 421</td>
<td>HELLENISTIC GREECE. (4 Credits)</td>
<td></td>
<td>History of the Greek world from the end of the Peloponnesian War to the Roman conquest of Greece; the careers of Alexander the Great and his successors; the art, literature, science, religion, and philosophy of the post-classical or Hellenistic world. Not offered every year. (H)</td>
<td><strong>Attributes:</strong> LACH – Liberal Arts Humanities Core</td>
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<tr>
<td>HST 422</td>
<td>MEDIEVAL SLAVERY. (4 Credits)</td>
<td></td>
<td>A seminar-style course on the history of slavery from late Rome until the beginning of the Atlantic slave trade. Focuses on both primary sources which shed light on premodern slavery, and on recent scholarly debates, as seen in secondary sources. Through the study of slavery, students will investigate the social and cultural history of the long Middle Ages, including questions of class, religion, economics, gender, race, and law.</td>
<td><strong>Attributes:</strong> LACH – Liberal Arts Humanities Core</td>
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<tr>
<td>HST 425</td>
<td>THE HOLOCAUST IN ITS HISTORY. (4 Credits)</td>
<td></td>
<td>An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSILISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)</td>
<td><strong>Attributes:</strong> CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core&lt;br&gt;<strong>Equivalent to:</strong> HST 425H, REL 425, REL 425H</td>
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<td>An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSILISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)</td>
<td><strong>Attributes:</strong> CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core&lt;br&gt;<strong>Equivalent to:</strong> HST 425, REL 425, REL 425H</td>
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<tr>
<td>HST 426</td>
<td>WORLD WAR I: A GLOBAL HISTORY. (4 Credits)</td>
<td></td>
<td>Examines World War I from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at Great Britain, France, Russia, Germany and their colonial possessions. Topics will include the concept of total war and the home fronts of a number of nations.</td>
<td><strong>Prerequisites:</strong> HST 103 with D- or better&lt;br&gt;<strong>Equivalent to:</strong> HST 425H</td>
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<tr>
<td>HST 427</td>
<td>TEACHING THE HOLOCAUST. (4 Credits)</td>
<td></td>
<td>Provides a broad sense of the Holocaust; reviews the event itself, its long-term background (the history of anti-Semitism), and the rise of Nazism and Fascism in the years before World War II. Examines what has been learned from the Holocaust and addresses the broader issue of genocide, especially in the 20th century.</td>
<td><strong>Equivalent to:</strong> HST 426</td>
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<tr>
<td>HST 428</td>
<td>HISTORY OF WESTERN THOUGHT. (4 Credits)</td>
<td></td>
<td>A synthesis of major developments in philosophy, science, social, and political theory and the arts in the European Enlightenment (1715-1789). Not offered every year. HST 428, HST 429, HST 430 need not be taken in sequence. (H)</td>
<td><strong>Attributes:</strong> LACH – Liberal Arts Humanities Core</td>
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<tr>
<td>HST 429</td>
<td>HISTORY OF WESTERN THOUGHT. (4 Credits)</td>
<td></td>
<td>A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1789 and 1890. Not offered every year. HST 428, HST 429, HST 430 need not be taken in sequence.</td>
<td><strong>Attributes:</strong> LACH – Liberal Arts Humanities Core</td>
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<tr>
<td>HST 430</td>
<td>HISTORY OF WESTERN THOUGHT. (4 Credits)</td>
<td></td>
<td>A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1890 and 1945. Not offered every year. HST 428, HST 429, HST 430 need not be taken in sequence. (H)</td>
<td><strong>Attributes:</strong> LACH – Liberal Arts Humanities Core</td>
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<td>HST 431</td>
<td>A HISTORY OF CHILDHOOD. (4 Credits)</td>
<td></td>
<td>Examines childhood as a social and historical construct and explores how race, class, gender, and geography have created unequal access to this protected category for individual children and continues to produce inequalities in children's health, education, and access to designated safe spaces. Explores how historical phenomena have impacted children, including colonialism, slavery, revolution, the rise of the modern state, the professionalization of medicine and social work, compulsory education, developing legal concepts about children's rights, the development of consumer mass culture, WWI, WWII, and the Cold War. Traces shifting understandings of the 'normal' child. (Bacc Core Course)</td>
<td><strong>Attributes:</strong> CPSI – Core, Pers, Soc Proc &amp; Inst</td>
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</table>
HST 432. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present. (H) (SS)
Attributes: LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 432H

HST 432H. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present. (H) (SS)
Attributes: HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HST 432

HST 433. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social, and religious developments that have shaped the history of England and ultimately of America and much of the world. Medieval and Tudor-Stuart England. HST 433/HST 533, HST 434/HST 534 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 434. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social, and religious developments that have shaped the history of England and ultimately of America and much of the world. England since 1668. HST 433/HST 533, HST 434/HST 534 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 435. THE HISTORY OF EUROPEAN WOMEN FROM 1400 TO 1789. (4 Credits)
Focuses on the social, economic, and cultural roles women in Europe between 1400 and 1789. Topics include Christianity and women, the Renaissance lady, the European witch craze, women rulers, the debate about female intellectual abilities, and the beginning of the campaign for female equality.
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 102 and HST 103

HST 436. HISTORY OF MODERN GERMANY. (4 Credits)
Political, economic, social and intellectual developments from 1815 through the imperial, Weimar, and Nazi eras to the present. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 452. MODERN MEXICO. (4 Credits)
History of Mexico since 1810--economic, political, and social change and relations with the United States. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 350 or HST 351 or upper-division standing.

HST 456. PROBLEMS IN LATIN AMERICAN HISTORY. (4 Credits)
A focused examination of the origins and development of selective institutions and problems important to understanding the region, such as the church, the military, labor, political instability, economic stagnation, and social stratification. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 350 or HST 351 or upper-division standing.

HST 460. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1776 to 1860. Not offered every year. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 461. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1860 to 1930. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 462. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1930 to the present. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 464. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from the nation’s founding to 1898. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 465. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 465H
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 465H. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 465
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.
HST 466. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSLISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: REL 466
Recommended: HST 201 or upper-division standing.

HST 467. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 468. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 469. HISTORY OF THE PACIFIC NORTHWEST. (4 Credits)
The demographic, ecological, and cultural transformation of Oregon, Washington, and Idaho from Indian times to the present. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 and HST 203 or upper-division standing.

HST 470. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSLISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: REL 470

HST 471. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from the English background to 1689. HST 471/ HST 571, HST 472/572 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 472. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from 1689 to 1763. HST 471/HST 571, HST 472/572 need not be taken in sequence. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 473. THE ERA OF THE AMERICAN REVOLUTION. (4 Credits)
The American Revolution, the drafting of the Constitution, and the launching of the new nation, 1763 to 1789. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 474. JEFFERSONIAN AND JACKSONIAN DEMOCRACY. (4 Credits)
American political, economic, religious, and social development during the early and middle national era with emphasis on the formation and growth of political parties, territorial expansion and western settlement, and the beginnings of sectional conflict. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 and HST 202 or upper-division standing.

HST 475. CIVIL WAR AND RECONSTRUCTION. (4 Credits)
Origins of the war, nature of the war, and the critical postwar era, 1830s to 1880s, with special attention to the changing historiography of the period. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 201 or upper-division standing.

HST 477. THE PROGRESSIVE AND NEW DEAL ERAS. (4 Credits)
Twentieth-century U.S. history from 1900 to 1939, with emphasis on political and economic developments; attention given to diplomatic, cultural, and social change. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 203

HST 478. THE U.S. SINCE 1939. (4 Credits)
United States political, cultural, and diplomatic history from the Second World War through the 1970s, with special emphasis on the Cold War at home and abroad. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 203 or upper-division standing.

HST 481. ENVIRONMENTAL HISTORY OF THE UNITED STATES. (4 Credits)
A study of human interaction with the environment and the transformation of the landscape and ecology of North America from the Indian period to the present, with special attention to the progressive alterations induced by the modernizing world of agriculture, industry, urbanism, and their relation to the market system in the United States. Not offered every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Recommended: HST 201, HST 202 and HST 203

HST 484. RELIGION AND LAW. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western "secular" society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others' laws, and the ways in which modern societies have used law to separate "religion" from the state. CROSSLISTED as HST 484/REL 484 and HST 584/REL 584.
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 484
HST 485. *POLITICS AND RELIGION IN THE MODERN MIDDLE EAST. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSLISTED as HST 485/REL 485 and HST 585/REL 585. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: REL 485

HST 486. A HISTORY OF CHRISTIANITY IN AFRICA. (4 Credits)
An investigation of the historical development and changing character of Christianity in Africa. Topics include the examination of the role of Christianity in the development of social identity and politics in historic Ethiopia from the early first millennium CE; Portuguese missionary efforts in Central Africa during the period of the Atlantic slave trade from the 15th to the 18th centuries; the role of 19th century missionaries in both spreading Christianity in Africa and during the European colonization of Africa at the end of the 19th century, the emergence of African independence churches and prophetic Christianity in the 20th century; and the .
Attributes: LACH – Liberal Arts Humanities Core
Recommended: HST 381 and/or HST 382

HST 487. WORLD WAR II: A GLOBAL HISTORY. (4 Credits)
Examines World War II from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at the US, USSR, Britain, Germany and Japan. Topics will include the concept of total war and the home fronts of a number of nations.
Recommended: HST 103

HST 488. *THE UNITED STATES AND VIETNAM 1945-1995. (4 Credits)
Examines the Vietnam War from both the US and Vietnamese perspective within the context of the Cold War. Political, military, social and moral issues will be covered within the concept of American exceptionalism. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

HST 490. *ISRAELI SOCIETY AND PLURALISM. (4 Credits)
Overwhelmingly a nation of immigrants, modern Israel displays an extraordinary amount of ethnic and social diversity among the 75% of its citizens who identify as Jews and among the 25% defined as Arab or “other.” By introducing students to Israel’s ethnic, religious, LGBTQ, migrant worker and refugee communities, this course examines the tensions that inform Israel’s efforts to construct a national identity within a multicultural society. Israel aspires to be both liberal democratic and Jewish, secular and religious. As such, it provides an unparalleled case study for investigating how a society negotiates the dynamics of inclusion, exclusion and difference.
Attributes: CSGI – Core, Synth, Global Issues

HST 494. MODERN JAPAN: A CULTURAL HISTORY. (4 Credits)
Japanese history from the Meiji to the contemporary period (1980s/1990s). Examination of Japanese tradition and the Tokugawa period. Investigation of Westernization/modernization, imperialism, national identity, gender, atomic bomb(s), and post-war culture. (H)
Attributes: LACH – Liberal Arts Humanities Core

HST 495. CHINA IN 20TH CENTURY. (4 Credits)
Treats the decline of the Confucian tradition, shifts in the economy, and metamorphoses of the political system. Attention is given to China’s attempt to balance her Communist revolutionary legacies with her current modernizing goals. (H) (NC)
Attributes: LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Recommended: HST 391 and HST 392 or upper-division standing.

HST 499. SPECIAL TOPICS. (1-16 Credits)
Supervised readings designed to allow students to explore in depth key issues in Asian history. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 499H
This course is repeatable for 16 credits.

HST 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HST 499
This course is repeatable for 16 credits.

HST 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HST 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

HST 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HST 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HST 507. SEMINAR, (5 Credits)
PREREQ: Graduate standing.
This course is repeatable for 20 credits.

HST 510. HISTORY INTERNSHIP. (1-12 Credits)
Supervised work of a historical nature with historical societies, archives, museums, or other public or private organizations. No more than 6 of the maximum 12 credits may be used to satisfy the history major requirement of 51 credits.
This course is repeatable for 12 credits.

HST 511. HISTORIOGRAPHY IN HISTORY. (4 Credits)
Introduces graduate students to the range of scholarship within the literature of history. Reveals the full sweep of history as an academic discipline and the process of its professionalization.

HST 512. METHODOLOGIES OF HISTORY. (4 Credits)
A study of the practice as well as theory of historical work. Combines training in reading, writing, and thinking historically with a survey of the development of history, philosophies of history, types and use of historical evidence, varieties of historical investigation, and factors that influence the writing of history.

HST 514. PUBLIC HISTORY. (4 Credits)
Introduces graduate students to the varied aspects and roles of public history, including cultural resource management, research, and report writing.

HST 515. SELECTED TOPICS. (4 Credits)
Selected topics of special or current interest not covered in other courses.
This course is repeatable for 16 credits.

HST 516. FOOD IN WORLD HISTORY. (4 Credits)
Historical analysis of food and cooking from pre-history to the present, with an emphasis on cross-cultural differences of food production and consumption.
HST 521. HELLENISTIC GREECE. (4 Credits)
History of the Greek world from the end of the Peloponnesian War to the Roman conquest of Greece; the careers of Alexander the Great and his successors; the art, literature, science, religion, and philosophy of the post-classical or Hellenistic world. Not offered every year.
Recommended: HST 101

HST 522. MEDIEVAL SLAVERY. (4 Credits)
A seminar-style course on the history of slavery from late Rome until the beginning of the Atlantic slave trade. Focuses on both primary sources which shed light on premodern slavery, and on recent scholarly debates, as seen in secondary sources. Through the study of slavery, students will investigate the social and cultural history of the long Middle Ages, including questions of class, religion, economics, gender, race, and law.

HST 525. THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525.
Equivalent to: REL 525

HST 526. WORLD WAR I: A GLOBAL HISTORY. (4 Credits)
Examines World War I from a global perspective. Its origins, the course of the conflict and its aftermath, looking especially at Great Britain, France, Russia, Germany and their colonial possessions. Topics will include the concept of total war and the home fronts of a number of nations.
Recommended: HST 103

HST 527. TEACHING THE HOLOCAUST. (4 Credits)
Provides a broad sense of the Holocaust; reviews the event itself, its long-term background (the history of anti-Semitism), and the rise of Nazism and Fascism in the years before World War II. Examines what has been learned from the Holocaust and addresses the broader issue of genocide, especially in the 20th century.

HST 528. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts in the European Enlightenment (1715-1789). Not offered every year. HST 528, HST 529, HST 530 need not be taken in sequence.

HST 529. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1789 and 1890. Not offered every year. HST 528, HST 529, HST 530 need not be taken in sequence.

HST 530. HISTORY OF WESTERN THOUGHT. (4 Credits)
A synthesis of major developments in philosophy, science, social, and political theory and the arts between 1890 and 1945. Not offered every year. HST 528, HST 529, HST 530 need not be taken in sequence.

HST 531. A HISTORY OF CHILDHOOD. (4 Credits)
Examines childhood as a social and historical construct and explores how race, class, gender, and geography have created unequal access to this protected category for individual children and continue to produce inequalities in children's health, education, and access to designated safe spaces. Explores how historical phenomena have impacted children, including colonialism, slavery, revolution, the rise of the modern state, the professionalization of medicine and social work, compulsory education, developing legal concepts about children's rights, the development of consumer mass culture, WWI, WWII, and the Cold War. Traces shifting understandings of the 'normal' child.

HST 532. THE HISTORY OF SEXUALITY. (4 Credits)
The history of human sexuality from ancient Greece to the present.

HST 533. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social and religious developments that have shaped the history of England and ultimately of America and much of the world. Medieval and Tudor-Stuart England. HST 433/ HST 533, HST 434/HST 534 need not be taken in sequence. Not offered every year.

HST 534. ENGLISH HISTORY. (4 Credits)
The major political, cultural, economic, social and religious developments that have shaped the history of England and ultimately of America and much of the world. England since 1688. HST 433/HST 533, HST 434/ HST 534 need not be taken in sequence. Not offered every year.

HST 535. THE HISTORY OF EUROPEAN WOMEN FROM 1400 TO 1789. (4 Credits)
Focuses on the social, economic, and cultural roles women in Europe between 1400 and 1789. Topics include Christianity and women, the Renaissance lady, the European witch craze, women rulers, the debate about female intellectual abilities, and the beginning of the campaign for female equality.
Recommended: HST 102 or HST 103

HST 536. HISTORY OF MODERN GERMANY. (4 Credits)
Political, economic, social and intellectual developments from 1815 through the imperial, Weimar, and Nazi eras to the present. Not offered every year.

HST 552. MODERN MEXICO. (4 Credits)
History of Mexico since 1810–economic, political, and social change and relations with the United States. Not offered every year.
Recommended: HST 350 or HST 351

HST 556. PROBLEMS IN LATIN AMERICAN HISTORY. (4 Credits)
A focused examination of the origins and development of selective institutions and problems important to understanding the region, such as the church, the military, labor, political instability, economic stagnation, and social stratification.
Recommended: HST 350 or HST 351

HST 560. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1776 to 1860. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 561. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1860 to 1930. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203

HST 562. AMERICAN THOUGHT AND CULTURE. (4 Credits)
An examination of the main currents of American thought and culture, emphasizing ideas and concepts that have influenced the development and growth of American institutions and values from 1930 to the present. HST 460/HST 560, HST 461/HST 561, HST 462/HST 562 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 564. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from the nation’s founding to 1898.
HST 464/HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 565. AMERICAN DIPLOMATIC HISTORY. (4 Credits)
American diplomatic relations from 1898 to the present. HST 464/ HST 564 and HST 465/HST 565 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 566. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSLISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: REL 566
Recommended: HST 202 and HST 203
HST 567. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 568. HISTORY OF THE AMERICAN WEST. (4 Credits)
Important themes in the transformation of western America from the pre-industrial world of native Americans to the emergence of the region as a major force in the cultural, economic, and political life of the United States. HST 467/HST 567 and HST 468/HST 568 need not be taken in sequence. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 569. HISTORY OF THE PACIFIC NORTHWEST. (4 Credits)
The demographic, ecological, and cultural transformation of Oregon, Washington, and Idaho from Indian times to the present. Not offered every year.
Recommended: HST 201 and HST 202 and HST 203
HST 570. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSLISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: REL 570
HST 571. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from the English background to 1689. HST 471/ HST 571, HST 472/572 need not be taken in sequence. Not offered every year.
Recommended: HST 201
HST 572. COLONIAL AMERICA. (4 Credits)
Economic, political, social, religious, and intellectual development of colonial North America from 1689 to 1763. HST 471/HST 571, HST 472/572 need not be taken in sequence. Not offered every year.
Recommended: HST 201
HST 573. THE ERA OF THE AMERICAN REVOLUTION. (4 Credits)
The American Revolution, the drafting of the Constitution, and the launching of the new nation, 1763 to 1789. Not offered every year.
Recommended: HST 201
HST 574. JEFFERSONIAN AND JACKSONIAN DEMOCRACY. (4 Credits)
American political, economic, religious, and social development during the early and middle national era with emphasis on the formation and growth of political parties, territorial expansion and western settlement, and the beginnings of sectional conflict. Not offered every year.
Recommended: HST 201 and HST 202
HST 575. CIVIL WAR AND RECONSTRUCTION. (4 Credits)
Origins of the war, nature of the war, and the critical postwar era, 1830s to 1880s, with special attention to the changing historiography of the period. Not offered every year.
Recommended: HST 202
HST 577. THE PROGRESSIVE AND NEW DEAL ERAS. (4 Credits)
Twentieth-century U.S. history from 1900 to 1939, with emphasis on political and economic developments; attention given to diplomatic, cultural, and social change. Not offered every year.
Recommended: HST 203
HST 578. THE U.S. SINCE 1939. (4 Credits)
United States political, cultural, and diplomatic history from the Second World War through the 1970s, with special emphasis on the Cold War at home and abroad. Not offered every year.
Recommended: HST 203
HST 581. ENVIRONMENTAL HISTORY OF THE UNITED STATES. (4 Credits)
A study of human interaction with the environment and the transformation of the landscape and ecology of North America from the Indian period to the present, with special attention to the progressive alterations induced by the modernizing world of agriculture, industry, urbanism, and their relation to the market system in the United States. Not offered every year.
Recommended: HST 201, HST 202, HST 203
HST 584. RELIGION AND LAW. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western “secular” society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others’ laws, and the ways in which modern societies have used law to separate “religion” from the state. CROSSLISTED as HST 484/REL 484 and HST 584/REL 584.
Equivalent to: REL 584
HST 585. POLITICS AND RELIGION IN THE MODERN MIDDLE EAST. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSLISTED as HST 485/REL 485 and HST 585/REL 585.
Equivalent to: REL 585
HST 586. A HISTORY OF CHRISTIANITY IN AFRICA. (4 Credits)
An investigation of the historical development and changing character of Christianity in Africa. Topics include the examination of the role of Christianity in the development of social identity and politics in historic Ethiopia from the early first millennium CE; Portuguese missionary efforts in Central Africa during the period of the Atlantic slave trade from the 15th to the 18th centuries; the role of 19th century missionaries in both spreading Christianity in Africa and during the European colonization of Africa at the end of the 19th century; the emergence of African independence churches and prophetic Christianity in the 20th century; and the .
Recommended: HST 381 and/or HST 382

HST 587. WORLD WAR II: A GLOBAL HISTORY. (4 Credits)
Examines World War II from a global perspective, its origins, the course of the conflict and its aftermath, looking especially at the US, USSR, Britain, Germany and Japan. Topics will include the concept of total war and the home fronts of a number of nations.
Recommended: Completion or concurrent enrollment in HST 103

HST 588. THE UNITED STATES AND VIETNAM 1945-1995. (4 Credits)
Examines the Vietnam War from both the US and Vietnamese perspective within the context of the Cold War. Political, military, social and moral issues will be covered within the concept of American exceptionalism.

HST 590. ISRAELI SOCIETY AND PLURALISM. (4 Credits)
Overwhelmingly a nation of immigrants, modern Israel displays an extraordinary amount of ethnic and social diversity among the 75% of its citizens who identify as Jews and among the 25% defined as Arab or "other." By introducing students to Israel's ethnic, religious, LGBTQ+, migrant worker and refugee communities, this course examines the tensions that inform Israel's efforts to construct a national identity within a multicultural society. Israel aspires to be both liberal democratic and Jewish, secular and religious. As such, it provides an unparalleled case study for investigating how a society negotiates the dynamics of inclusion, exclusion and difference.

HST 594. MODERN JAPAN: A CULTURAL HISTORY. (4 Credits)
Japanese history from the Meiji to the contemporary period (1980s/1990s). Examination of Japanese tradition and the Tokugawa period. Investigation of Westernization/modernization, imperialism, national identity, gender, atomic bomb(s), and post-war culture.

HST 595. CHINA IN 20TH CENTURY. (4 Credits)
Treats the decline of the Confucian tradition, shifts in the economy, and metamorphoses of the political system. Attention is given to China's attempt to balance her Communist revolutionary legacies with her current modernizing goals.
Recommended: HST 391 and HST 392

HST 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

History of Science (HSTS)

HSTS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 407. SEMINAR. (1-16 Credits)
Equivalent to: HSTS 407H
This course is repeatable for 16 credits.

HSTS 411. *HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas within their social and cultural contexts. Scientific thought from ancient civilizations to the post-Roman era. Not offered every year. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence. (H) (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Recommended: Upper-division standing and at least one science sequence

HSTS 412. *HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas within their social and cultural context. Origin of modern science in the 16th and 17th centuries. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and at least one science sequence

HSTS 413. *HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas with their social and cultural context. Development of modern science in the 18th and 19th centuries and to the present. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and at least one science sequence

HSTS 414. *HISTORY OF TWENTIETH-CENTURY SCIENCE. (4 Credits)
Focuses on the organization, practice, and theories of the natural sciences in the twentieth century, with emphasis primarily on the European and American scientific traditions from the 1890s to the present. (H) (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core

HSTS 415. **THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin's theory of evolution. Reception of theory and history of evolution to the present. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 415H
Recommended: Upper-division standing.

HSTS 415H. **THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin's theory of evolution. Reception of theory and history of evolution to the present. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 415

HSTS 416. *HISTORY OF MEDICINE PRE-1800. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture, to 1800. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
HSTS 417. **HISTORY OF MEDICINE. (4 Credits)**
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 417H

HSTS 417H. **HISTORY OF MEDICINE. (4 Credits)**
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 417

HSTS 418. *SCIENCE AND SOCIETY. (4 Credits)*
Historical study of the interaction of science and society. Case studies are used from the 18th through 20th centuries. Topics vary by term. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HSTS 419. **STUDIES IN SCIENTIFIC CONTROVERSY: METHODS AND PRACTICES. (4 Credits)**
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries. (H) (SS) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 419H

HSTS 419H. **STUDIES IN SCIENTIFIC CONTROVERSY: METHODS AND PRACTICES. (4 Credits)**
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core
Equivalent to: HSTS 419

HSTS 421. *TECHNOLOGY AND CHANGE. (4 Credits)*
Current views of technology and associated cultural changes and the contexts in which these developed; the changing role of technology in modern industrial society, especially in the United States; recent efforts to predict and control technological developments and the social and cultural consequences. (H) (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core; LACS – Liberal Arts Social Core

HSTS 422. **HISTORICAL STUDIES OF SCIENCE AND POLITICS. (4 Credits)**
The historical study of scientists, their work, their political and ethical choices mainly in the United States and Europe from the 1920s to the 1950s. (H) (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC; LACH – Liberal Arts Humanities Core

HSTS 423. *SCIENCE AND RELIGION. (4 Credits)*
A historical survey of critical issues in the relationship of Western science and religion from ancient times to the end of the twentieth century. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core

HSTS 425. **HISTORY OF THE LIFE SCIENCES. (4 Credits)**
History of ideas about life from Greeks to present day. Cultural background and development of major theories of the life sciences with emphasis on natural history. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC – Core, Skills, WIC
Recommended: Upper-division standing plus one year college sciences.

HSTS 437. *HISTORY OF ANIMALS IN SCIENCE. (4 Credits)*
Using a variety of sources, this course explores the ways humans have thought about and used animals in science and medicine from the seventeenth century to the present. How has science constructed the boundaries between humans and animals, and what have the consequences been for each? (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

HSTS 440. *HISTORY OF PSYCHOTHERAPY. (4 Credits)*
The history of psychotherapy in modern Western societies, from biomedical, cultural, political, and psychosocial perspectives. Not offered every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 440H

HSTS 440H. *HISTORY OF PSYCHOTHERAPY. (4 Credits)*
The history of psychotherapy in modern Western societies, from biomedical, cultural, political, and psychosocial perspectives. Not offered every year. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 440

HSTS 451. **THE HISTORY OF OUTER SPACE. (4 Credits)**
Advancements in technology and science has made it possible to observe, robotically explore, personally visit, and daily use outer space including an overview of what we have learned, how this endeavor has shaped human civilization and culture, and what may lie ahead. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
HSTS 452. *A WOMEN'S HISTORY OF OUTER SPACE. (4 Credits)
Since early Babylon, women have also observed the sky, performed fundamental calculations, examined astronomical plates, and made significant fundamental discoveries that changed the way we see the cosmos. At NASA, women have gone from purely secretarial positions in 1958 to commanding the International Space Station and administering the Mars Rover Program today. These advancements in opportunity and responsibility reflect a larger story of how traditional roles for women have evolved in response to changes in both technology and social norms. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HSTS 499. SPECIAL TOPICS. (1-16 Credits)
(H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HSTS 499H
This course is repeatable for 16 credits.

HSTS 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

HSTS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HSTS 511. HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas within their social and cultural context. Scientific thought from ancient civilizations to the post-Roman era. Not offered every year. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence.
Recommended: At least one science sequence

HSTS 512. HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas with their social and cultural context. Origin of modern science in the 16th and 17th centuries. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence.
Recommended: At least one science sequence

HSTS 513. HISTORY OF SCIENCE. (4 Credits)
Stresses the interaction of scientific ideas with their social and cultural context. Development of modern science in the 18th and 19th centuries and to the present. HSTS 411/HSTS 511, HSTS 412/HSTS 512, HSTS 413/HSTS 513 need not be taken in sequence.
Recommended: At least one science sequence

HSTS 514. HISTORY OF TWENTIETH-CENTURY SCIENCE. (4 Credits)
Focuses on the organization, practice, and theories of the natural sciences in the twentieth century, with emphasis primarily on the European and American scientific traditions from the 1890s to the present.

HSTS 515. THEORY OF EVOLUTION AND FOUNDATION OF MODERN BIOLOGY. (4 Credits)
Origin and development of Darwin's theory of evolution. Reception of theory and history of evolution to the present.

HSTS 516. HISTORY OF MEDICINE PRE-1800. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture, to 1800.

HSTS 517. HISTORY OF MEDICINE. (4 Credits)
History of medical theory and the changing role of the physician; internal development of medicine as a discipline as well as a profession; relationship of medicine's development to general changes in science and culture.

HSTS 518. SCIENCE AND SOCIETY. (4 Credits)
Historical study of the interaction of science and society. Case studies are used from the 18th through 20th centuries. Topics vary by term.

HSTS 519. STUDIES IN SCIENTIFIC CONTROVERSY: METHOD AND PRACTICE OF. (4 Credits)
Course focuses on accounts of scientific discoveries that have been controversial, to understand the rational, psychological, and social characteristics which have defined the meaning and procedures of the natural sciences. Case studies are used from the 18th through 20th centuries.

HSTS 521. TECHNOLOGY AND CHANGE. (4 Credits)
Current views of technology and associated cultural changes and the contexts in which these developed; the changing role of technology in modern industrial society, especially in the United States; recent efforts to predict and control technological developments and the social and cultural consequences.

HSTS 522. HISTORICAL STUDIES OF SCIENCE AND POLITICS. (4 Credits)
The historical study of scientists, their work, their political and ethical choices mainly in the United States and Europe from the 1920s to the 1950s.

HSTS 523. SCIENCE AND RELIGION. (4 Credits)
A historical survey of critical issues in the relationship of Western science and religion from ancient times to the end of the twentieth century.

HSTS 525. HISTORY OF THE LIFE SCIENCES. (4 Credits)
History of ideas about life from Greeks to present day. Cultural background and development of major theories of the life sciences with emphasis on natural history.
Recommended: One year of college sciences

HSTS 537. HISTORY OF ANIMALS IN SCIENCE. (4 Credits)
Using a variety of sources, this course explores the ways humans have thought about and used animals in science and medicine from the seventeenth century to the present. How has science constructed the boundaries between humans and animals, and what have the consequences been for each?

HSTS 540. HISTORY OF PSYCHOTHERAPY. (4 Credits)
The history of psychotherapy in modern Western societies, from biomedical, cultural, political, and psychosocial perspectives. Not offered every year.

HSTS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 36 credits.

HSTS 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
Honors College (HC)

HC 001. SERVICE LEARNING. (0 Credits)
Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.
Attributes: HNRS – Honors Course Designator

HC 002. LEADERSHIP. (0 Credits)
Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.
Attributes: HNRS – Honors Course Designator

HC 199. *HONORS WRITING. (3 Credits)
Through a range of assignments, texts, and guest speakers, Honors College students will develop critical thinking skills and a strategy for writing in their discipline. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator
Prerequisites: WR 121 with D- or better or WR 121H with D- or better

HC 299. SELECTED TOPICS. (1-16 Credits)
Selected topics for Honors College students.
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 399. SELECTED TOPICS. (1-16 Credits)
Upper-division special topics for Honors College students.
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 402. INDEPENDENT STUDY. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 403. THESIS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 404. WRITING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 405. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 406. PROJECTS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 407. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 18 credits.

HC 408. WORKSHOP. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 409. PRACTICUM. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

HC 499. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
This course is repeatable for 16 credits.

Horticulture (HORT)

HORT 112. INTRODUCTION TO HORTICULTURAL SYSTEMS, PRACTICES AND CAREERS. (2 Credits)
Overview of horticultural systems and practices, with an emphasis on the Pacific Northwest. Exploration of career opportunities in horticulture. Includes viticulture, environmental landscaping, turf management, greenhouse and nursery production, farming, education, and research. Required field trips.

HORT 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: HORT 199H
This course is repeatable for 16 credits.

HORT 199H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 199
This course is repeatable for 16 credits.

HORT 212. INTRODUCTION TO ORGANIC AGRICULTURAL SYSTEMS. (4 Credits)
An introduction to organic agricultural systems with a focus on history, regulations, principles and practices, performance, trends, and careers.

HORT 217. *SOCIAL IMPACTS OF SCIENCE. (3 Credits)
Contemporary societies provide funding for scientific research, at the same time they struggle with existing and emerging societal problems. This course will discuss how social problems can be addressed by science and technology, and how the impacts of research are quantified. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

HORT 226. LANDSCAPE PLANT MATERIALS I: DECIDUOUS HARDWOODS AND CONIFERS. (4 Credits)
Identification of trees, shrubs, vines, and ground covers used in landscape horticulture. Basic plant taxonomy, nomenclature, anatomy, and use of plants in the landscape. Diverse plant material covered with an emphasis on deciduous hardwoods and conifers.

HORT 228. LANDSCAPE PLANT MATERIALS II: SPRING FLOWERING TREES AND SHRUBS. (4 Credits)
Identification of trees, shrubs, vines, and ground covers used in landscape horticulture. Basic plant taxonomy, nomenclature, anatomy, and use of plants in the landscape. Diverse plant material covered with an emphasis on spring flowering trees and shrubs. Lec/rec.

HORT 251. TEMPERATE TREE FRUIT, BERRIES, GRAPES, AND NUTS. (2 Credits)
Covers fruit and nut crops for temperate zones. Emphasis placed on scientific and common names, plant adaptation, basic morphology, major cultivars, and markets. Offered alternate years.

HORT 255. HERBACEOUS ORNAMENTAL PLANT MATERIALS. (3 Credits)
Identification and culture of herbaceous plants used in the landscape. Offered via Ecampus only.
HORT 260. ORGANIC FARMING AND GARDENING. (3 Credits)
Organic farming and gardening methods are discussed in class and practiced in the field. The philosophical background of organic farming as well as the biological, environmental and social factors involved in organic food production are covered. Emphasis is on hands-on application of scientific principles to create sustainable food production systems. Lec/lab.

HORT 270. INTRODUCTION TO THERAPEUTIC HORTICULTURE. (2 Credits)
An introduction to the history, benefits, and methods of therapeutic horticulture. Surveys program models for vocational, social/recreational, wellness and therapeutic applications of horticulture.

HORT 271. TECHNIQUES AND ADAPTIVE STRATEGIES IN THERAPEUTIC HORTICULTURE. (2 Credits)
An introduction to the characteristics of therapeutic gardens. Survey of year-round, indoor and outdoor therapeutic horticultural programming adaptations, strategies and techniques for different special populations.
Prerequisites: HORT 270 with D- or better

HORT 272. BASIC THERAPEUTIC SKILLS I. (2 Credits)
The assessment and evaluation process in therapeutic horticulture. Development of communication strategies, helping skills, and horticultural skills for therapeutic situations.
Prerequisites: HORT 271 with D- or better

HORT 273. BASIC THERAPEUTIC SKILLS II. (2 Credits)
Assessment and documentation tools in therapeutic horticulture. Treatment issues related to different types of physical and mental issues. Conduct and evaluate therapeutic horticultural activity sessions.
Prerequisites: HORT 272 with D- or better

HORT 274. THERAPEUTIC HORTICULTURAL PROGRAMS FOR OLDER ADULTS/CHILDREN. (2 Credits)
Benefits and applications of therapeutic horticulture to older adults and special needs children.
Prerequisites: HORT 273 with D- or better

HORT 275. THERAPEUTIC GARDEN DESIGN, MAINTENANCE AND PROGRAMMING. (2 Credits)
The history, characteristics and design of the therapeutic garden. The use of the garden in therapeutic horticultural programming.
Prerequisites: HORT 274 with D- or better and HORT 280 [D-]

HORT 283. INTRODUCTION TO URBAN AGRICULTURE. (3 Credits)
Focuses on the adoption of agricultural principles to the urban environment, specifically the production of plant crops. Topics include: (I) urban environments and infrastructure, (II) urban crop production practices, (III) urban markets and farm management. Exposes students to the breadth of items that they should consider in order to be a successful urban grower.
Recommended: General background or previous coursework in agriculture

HORT 285. PERMACULTURE DESIGN AND THEORY: CERTIFICATE COURSE. (4 Credits)
Permaculture design course meets internationally recognized standards for certification. Lectures, hands-on activities, experiential learning, group discussions, readings, student projects and presentations. Two mandatory weekend days. Design intensive, utilizing graphic and verbal presentation skills. Research into other functioning permaculture systems through literature, websites, and as observed on field trips. Lec/lab.
This course is repeatable for 8 credits.

HORT 289. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: HORT 299H
This course is repeatable for 16 credits.

HORT 299H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 299
This course is repeatable for 16 credits.

HORT 300. CROP PRODUCTION IN PACIFIC NORTHWEST AGROECOSYSTEMS. (4 Credits)
Relation of crop production to human culture and the natural environment. Origins of agriculture and the processes of agricultural change, and productivity and sustainability of specific crop production systems in the Pacific Northwest. History, geography, resource requirements, and key challenges faced are presented. Fundamental crop production practices in relation to productivity and sustainability. Lec/lab/rec. CROSSTLISTED as CROP 300/HORT 300.
Equivalent to: CROP 300, CSS 300
Recommended: One year of general biology

HORT 301. GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS. (3 Credits)
Gain fundamental knowledge of plant growth and development of horticultural crops from a micro- to macro-level starting at double fertilization through fruit growth--covering seed-to-seed. The last section specifically examines how environmental factors affect growth and development. Lec/lab.
Recommended: General biology or botany sequence.

HORT 303. HORTICULTURAL PROJECTS. (2 Credits)
Student-managed crop production projects with emphasis on container grown, greenhouse crops. Crop scheduling, propagation and planting, selecting temperature and lighting regimes, specifying growth regulator applications, nutrient management, irrigation management, pest monitoring, and problem diagnosis and correction.
Recommended: HORT 301

HORT 306. INPUTS IN ORGANIC CROPPING SYSTEMS: SOURCING AND EFFICACY. (2 Credits)
Applied course focused on the regulation, sourcing, and efficacy of organic inputs including soil amendments, fertilizers, and pesticides. Gain experience using science-, practice-, and regulation-based information to source and determine effectiveness of inputs in certified organic cropping systems.
Prerequisites: HORT 212 with C- or better and CROP 355 [C-]

HORT 307. ORGANIC SYSTEM PREDICAMENTS. (3 Credits)
Analyze controversial organic agriculture and systems issues while developing critical- and systems-thinking skills. Synthesis of information from diverse sources and application of scientific knowledge will be required to recommend possible solutions to real world organic agriculture predicaments.

HORT 308. WEED MANAGEMENT IN ORGANIC CROPPING SYSTEMS. (3 Credits)
Applied organic weed identification and management course. Learn real-world application of science-, practice-, and regulation-based weed management information while designing and evaluating organic weed management plans for certified organic farming systems.
HORT 310. PRINCIPLES OF PLANT PROPAGATION. (3 Credits)
Plant propagation is the regeneration of plants using vegetative plant parts or seeds to maintain the desired genetic makeup. Theory and principles of horticultural and physiological concepts applicable for laboratory, greenhouse, nursery, field, and orchard propagators.
Prerequisites: HORT 301 with D- or better

HORT 311. PLANT PROPAGATION. (4 Credits)
The regeneration of plants from vegetative and reproductive tissue and organs. Horticultural and physiological principles, methods, and techniques for laboratory, greenhouse, nursery, field, and orchard.
Recommended: HORT 301

HORT 314. PRINCIPLES OF TURFGRASS MAINTENANCE. (4 Credits)
Identification and adaptation of common turfgrasses. Physiology of turfgrass growth and response to cultural and environmental stresses. Cultural practices including establishment, general maintenance, and pest control. Field trips required.
Recommended: (CSS 205 or CSS 305 or SOIL 205)

HORT 315. SUSTAINABLE LANDSCAPES: MAINTENANCE, CONSERVATION, RESTORE. (4 Credits)
Sustainable care and maintenance practices for non-turf landscape areas. Low input pruning, planting, fertilization, and pest control with an emphasis on IPM. Plant responses to stress, particularly those encountered in the urban environment. Outdoor labs required.
Recommended: Basic knowledge of plant physiology

HORT 316. PLANT NUTRITION. (4 Credits)
Basic concepts and principles of plant mineral nutrition that provide a basis for solving practical nutritional problems in horticultural crops. Areas covered include mineral nutrients, nutrient availability in the soil and plant uptake, nutrient deficiencies and toxicities and their causes and remedies, and plant and soil analysis. Lec/lab/rec.
Prerequisites: CSS 205 with D- or better or CSS 305 with D- or better or SOIL 205 with D- or better

HORT 318. *APPLIED ECOLOGY OF MANAGED ECOSYSTEMS. (3 Credits)
Survey of ecological processes in managed ecosystems emphasizing ecological management techniques. Ecosystem services; biodiversity management; weed dynamics; agroecology; urban ecology; restoration and mitigation; landscape management. Field trip required. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

HORT 319. RESTORATION HORTICULTURE. (3 Credits)
As world population increases to some 9 billion plus by 2044, the importance of ecologically sound horticultural practices becomes increasingly apparent. Integration of ecological concepts and theory in management and development of created landscapes is critical for the preservation of many ecological services currently provided by undeveloped areas. Offered via Ecampus only.
Recommended: WR 121 with proficiency in writing skills and ability to communicate through writing. Basic ecology course or practical experience providing understanding of ecological principals and concepts

HORT 330. *PLAGUES, PESTS, AND POLITICS. (3 Credits)
Integration and interaction of agricultural and public health aspects of entomology in society and history. CROSSLISTED as ENT 300/HORT 330. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: BI 300, ENT 300

HORT 331. *POLLINATORS IN PERIL. (3 Credits)
Pollinators, human influences on pollination systems, and the potential consequences of pollinator decline. An introduction to the skills needed to investigate media reports and multidisciplinary scientific research. Effects of pesticides, habitat fragmentation, climate change, invasive species, pests, pathogens, and other threats to pollinators in critical natural and agricultural systems around the world. CROSSLISTED as ENT 331/HORT 331. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: ENT 331
Recommended: Completion of a Baccalaureate Core biological science course.

HORT 344. INSECT AND DISEASE MANAGEMENT IN ORGANIC CROPPING SYSTEMS. (3 Credits)
A skills-based course on the science, practice, and regulations related to insect and disease management in organic cropping systems.
Prerequisites: BOT 350 with C- or better and ENT 311 [C-]
This course is repeatable for 3 credits.

HORT 349. DIAGNOSING PLANT PROBLEMS. (3 Credits)
Basic principles of problem diagnosis in crop, garden, and landscape plants are covered. Problems caused by cultural and environmental issues, plant diseases, insect pests, and other causes are addressed. Students will gain familiarity with resources for plant problem diagnosis. Offered via Ecampus only.
Recommended: Background in basic biology, plant pathology and/or entomology from a university or practical setting

HORT 350. URBAN FORESTRY. (3 Credits)
Introduction to principles and practices of planting and managing trees as a system of urban environment; understanding the economic, environmental, social aspects of urban forests, and an overview of contemporary land use issues and societal perspectives between people and plants. CROSSLISTED as FES 350/HORT 350.
Equivalent to: FES 350, FOR 350
Recommended: Foundational forestry and horticulture courses

HORT 351. FLORICULTURE AND GREENHOUSE SYSTEMS. (4 Credits)
For students interested in growing plants in commercial or educational greenhouses. Actively explores the production and scheduling of floriculture crops for various markets. Combines the practical aspects of growing floral crops under environments created by traditional and technologically advanced greenhouses. Greenhouse structures and crop environment manipulation will be emphasized. Students actively manage a floriculture crop and are responsible for developing and implementing production schedules, and for making key decisions on the culture of diverse floral crops.
Recommended: HORT 301

HORT 358. LANDSCAPE CONSTRUCTION TECHNIQUES. (4 Credits)
Study of landscape construction process from initial site analysis to finished landscape. Techniques used in building hardscape and landscape areas. Field trips required. Lec/lab.

HORT 360. IRRIGATION AND DRAINAGE. (4 Credits)
Familiarizes students with the principles and practices of irrigation and drainage systems. Optimum use of water, irrigation and drainage system design, installation, repairs, and troubleshooting are emphasized. Lec/lab.
Prerequisites: CSS 305 with D- or better or SOIL 205 with D- or better or SOIL 205 with D- or better
HORT 361. PLANT NURSERY SYSTEMS. (4 Credits)
Covers how to grow shrubs and trees, and herbaceous annuals and perennials in nurseries for use in urban landscapes and managed ecosystems such as forestry and restoration. Plant nursery systems are diverse and require intensive management involving a dynamic decision making process. This course actively explores field and container production systems as well as the marketing of plants, an overview of plant growth regulation and post-production handling, the influence of efficient production practices on plant quality, integrating pest management strategies, and natural resource utilization.
Recommended: HORT 301

HORT 380. SUSTAINABLE LANDSCAPE DESIGN. (3 Credits)
The assessment of design problems/situations, the development of solutions and the communication of those solutions to the client through the design. Specific topics include designing for ecosystem maintenance/enhancement, introduction to computer-aided design (CAD), using color in landscape designs and rendering section/elevation views.

HORT 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: HORT 405H
This course is repeatable for 16 credits.

HORT 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 405
This course is repeatable for 16 credits.

HORT 406. PROJECTS: DATA PRESENTATIONS. (1 Credit)
For any student doing research, to learn to develop and evaluate poster and slide presentations containing scientific data. Students are exposed to a variety of scientific disciplines as they prepare and critique their own and other students' posters and oral presentations. Students improve written and oral communication skills. Letter grade is based on participation, improvement, and the quality of a final poster project and oral presentation. Offered winter term. CROSSLISTED as BRR 406/HORT 406.
Equivalent to: BRR 406

HORT 407. SEMINAR. (1 Credit)
Senior seminar intended to instruct students on proper techniques for presentation of scientific material. Each student is expected to prepare and present a scientific seminar and to attend and evaluate the seminars given by other class members.

HORT 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 410. INTERNSHIP. (1-12 Credits)
Work internship to acquaint horticulture majors with the practices of the horticulture industry. Under direction of departmental internship committee. Requires approved statement of intent, submission of employer and employee evaluation forms and written report. This course is repeatable for 12 credits.

HORT 411. HORTICULTURE BOOK CLUB. (1 Credit)
Reading and discussion of noteworthy books and associated topics relating to agriculture, society and the environment. This course is repeatable for 2 credits.

HORT 412. CAREER EXPLORATION: INTERNSHIPS AND RESEARCH PROJECTS. (1 Credit)
Provides orientation to the horticulture major internship and research project requirement. Covers procedures for selecting, performing, and reporting on an internship or research project. Includes guidance and skill development valuable in the pursuit of horticultural career goals, such as cover letter and resume preparation and interviewing experience.

HORT 414. PRECISION AGRICULTURE. (4 Credits)
Provides insight into the technology available to support precision agriculture and data management planning applications. Examines the concepts and applications of precision agriculture to teach practical use of hardware, equipment and software. An overview of current technology including autonomous vehicles, GPS, soil and crop proximal sensors, imagery and mapping, variable rate control systems, and yield monitors. Lec/lab. CROSSLISTED as CROP 414/HORT 414.
Equivalent to: CROP 414

HORT 418. GOLF COURSE MAINTENANCE. (4 Credits)
Basic aspects of golf course maintenance under temperate zone conditions. Lec/lab.
Recommended: HORT 314

HORT 421. HERBS, SPICES, AND MEDICINAL PLANTS. (3 Credits)
Principles of crop ecology, morphology, chemistry and utilization of natural products of herbs, spices, and medicinal plants (HSMP). Examines the history and importance of HSMP, their historic and modern uses, current market trends, botany, collection in the wild, fundamentals of production systems for HSMP, harvesting, drying, and other postharvest operations, natural products and their uses, regulations and legal concerns of herbal products.
Recommended: CROP 200 or equivalent horticulture course

HORT 433. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years. CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Prerequisites: BI 102 with D- or better or BI 213 with D- or better or BI 311 with D- or better or HORT 430 with D- or better or CSS 430 with D- or better or HORT 450 with D- or better or CSS 450 with D- or better or PBG 450 with D- or better
Equivalent to: CROP 433, HORT 233
HORT 444. INSECT AGROECOLOGY. (3 Credits)  
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape. CROSSTLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.  
Equivalent to: ENT 444  
Recommended: General background or previous course work in entomology.  
HORT 447. ARBORICULTURE. (4 Credits)  
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSTLISTED as FES 447/HORT 447 and FES 547/HORT 547.  
Equivalent to: FES 447, FOR 447  
Recommended: (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)  
HORT 451. TREE FRUIT PHYSIOLOGY AND CULTURE. (4 Credits)  
Plant growth and development in relation to tree fruit production; emphasis on canopy development and pruning theory, flowering and fruit set, and development, dormancy, and cold acclimation. Field trips required.  
Recommended: Completion or concurrent enrollment in HORT 301 and BOT 331  
HORT 452. BERRY AND GRAPE PHYSIOLOGY AND CULTURE. (4 Credits)  
Production of wine grapes, caneberrries, strawberries, blueberries, and other miscellaneous berry crops. Emphasis on plant growth and development; pruning and training systems; flower and fruit development and cultivars. Field trips required. Offered in alternate years.  
Recommended: HORT 301  
HORT 453. GRAPEVINE GROWTH AND PHYSIOLOGY. (3 Credits)  
The physiological aspects of grapevine growth and development including dormancy, flowering and fruit set, vegetative growth, fruit development and water relations. Additional topics include taxonomy, morphology and physiological influences of vineyard mesoclimate and vine microclimate. Lec/lab.  
Prerequisites: HORT 301 with C- or better  
Recommended: HORT 301  
HORT 454. PRINCIPLES AND PRACTICES OF VINEYARD PRODUCTION. (3 Credits)  
The relationship of vineyard and canopy management to grapevine physiology and fruit quality. Nutrient/water relations within the soil/vine continuum. Vineyard microclimate, floor management, and pests will also be discussed. Lec/lab.  
Prerequisites: HORT 301 with D- or better  
Recommended: Completion or concurrent enrollment in HORT 453  
HORT 455. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)  
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSTLISTED as FES 455/HORT 455 and FES 555/HORT 555.  
Equivalent to: FES 455, FOR 455  
Recommended: FES 350 or FOR 350 or HORT 350  
HORT 456. PHYSIOLOGY AND PRODUCTION OF BERRY CROPS. (4 Credits)  
Physiology and production systems of blueberries, red and black raspberries, blackberries, and other berry crops. Emphasis on plant growth and development; flower and fruit development; cultivars; pruning and training systems; irrigation; harvesting; nutrient management; and conventional and organic production systems.  
Prerequisites: HORT 301 with D- or better  
HORT 463. SEED BIOLOGY. (3 Credits)  
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSTLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.  
Equivalent to: CROP 463, HORT 363  
HORT 480. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)  
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSTLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.  
Equivalent to: CROP 480  
Recommended: CROP 300 or HORT 300  
HORT 481. HORTICULTURE PRODUCTION CASE STUDIES. (4 Credits)  
Field-based case studies investigate production issues encountered in horticultural crops; individual and group activities; discussion of processes for troubleshooting, decision-making and management recommendations; assessment of economic, practical and logistical feasibility. Prior knowledge of plant physiology, soils, entomology, and plant nutrition are required. Multiple field trips required. A field trip fee will be charged.  
Prerequisites: HORT 301 with D- or better  
HORT 482. DESIGN AND MANAGEMENT OF ORGANIC CROPPING SYSTEMS. (3 Credits)  
This capstone course is the final stage of the Organic Farming Systems Certificate Program. Iteratively design and evaluate organic farming system management plans. Apply real-world science-, practice-, and regulation-based information to the design and management of organic farming systems.  
Prerequisites: HORT 212 with C- or better and CROP 355 [C-] and HORT 306 (may be taken concurrently) [C-] and HORT 307 (may be taken concurrently) [C-] and HORT 308 (may be taken concurrently) [C-] and HORT 344 (may be taken concurrently) [C-] and SOIL 360 (may be taken concurrently) [C-]  
HORT 483. CASE STUDIES IN URBAN AGRICULTURE. (3 Credits)  
Provides an overview of the diversity of endeavors that are available to potential urban agriculturists. These include urban and peri-urban farms (for profit and non-profit), community and school gardens, controlled climate facilities, rooftop farms and gardens, and more. For each case study, we will specifically examine: (1) the market where the farmer sells goods, (2) methods of achieving growth, particularly while avoiding debt, (3) increasing livelihood reliance upon on-farm income.  
Recommended: General background or previous coursework in agriculture
HORT 485. ADVANCED PERMACULTURE DESIGN TOOLS FOR CLIMATE RESILIENCE. (3 Credits)
Permaculture is a design system for creating sustainable human habitation that enriches the natural world. With climate change, geophysical and social conditions are shifting on the planet. There are specific tools that the permaculture designer can use to assess, analyze and project future climate scenarios and respond to them with resilient design. Climate analogue identification and climate change forecasting provide the basis for a student design project that addresses current and future climatic conditions. Students will complete all design mapping assignments using Google Earth Pro, and tutorials will be provided as a component of the course curriculum.

Prerequisites: HORT 285 with B or better

HORT 495. HORTICULTURAL MANAGEMENT PLANS. (3 Credits)
Develop an integrated management plan for a horticultural enterprise. This course is repeatable for 6 credits.

HORT 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: HORT 499H
This course is repeatable for 16 credits.

HORT 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HORT 499
This course is repeatable for 16 credits.

HORT 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

HORT 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 510. INTERNSHIP. (1-12 Credits)
Offered via Ecampus only.
This course is repeatable for 12 credits.

HORT 511. RESEARCH AND EDUCATIONAL PERSPECTIVES IN HORTICULTURE. (2 Credits)
Introduces beginning graduate students to the faculty in horticulture and provides an in-depth discussion of their research and education programs.

HORT 518. CURRENT TOPICS IN ENTOMOLOGY. (2 Credits)
A core course of the Horticulture graduate program. Provides an advanced understanding of entomology and its relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as ENT 518/HORT 518.
Equivalent to: ENT 518
This course is repeatable for 12 credits.

HORT 519. CURRENT TOPICS IN PLANT BREEDING AND GENETICS. (2 Credits)
Provides an advanced understanding of plant breeding and genetics and their relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as HORT 519/PBG 519.
Equivalent to: PBG 519
This course is repeatable for 12 credits.

HORT 520. CURRENT TOPICS IN HORTICULTURAL RESEARCH. (2 Credits)
This is a core course in the horticulture graduate program. Students gain an advanced understanding of horticulture science and its relationship to other disciplines through critical analysis of the scientific literature. Students practice synthesizing information and presenting findings to their peers. Instructors, topics and specific learning objectives vary from term to term.
This course is repeatable for 12 credits.

HORT 521. HERBS, SPICES, AND MEDICINAL PLANTS. (3 Credits)
Principles of crop ecology, morphology, chemistry and utilization of natural products of herbs, spices, and medicinal plants (HSMP). Examines the history and importance of HSMP, their historic and modern uses, current market trends, botany, collection in the wild, fundamentals of production systems for HSMP harvesting, drying, and other postharvest operations, natural products and their uses, regulations and legal concerns of herbal products.
Recommended: CROP 200 or equivalent course in HORT.

HORT 533. SYSTEMATICS AND ADAPTATION OF VEGETABLE CROPS. (4 Credits)
Covers the botanical and taxonomic relationships, breeding systems and adaptation of vegetable crops. Fresh material is used to illustrate varietal differences and traits of importance. Lec/lab. Offered even years. CROSSLISTED as CROP 433/HORT 433 and CROP 533/HORT 533.
Equivalent to: CROP 533
Recommended: BI 102 or BI 213 or BI 311 or HORT 430 or CSS 430 or HORT 450 or CSS 450

HORT 540. ORGANIC VEGETABLE PRODUCTION SYSTEMS: DESIGN AND MANAGEMENT. (3 Credits)
Design, management, and troubleshooting in organic vegetable production systems. Students learn to integrate knowledge from various technical disciplines and explore the social, economic, and environmental dimensions of vegetable production to analyze and evaluate organic vegetable farm enterprises.
Recommended: CROP/SOIL 530 and ENT 548

HORT 544. INSECT AGROECOLOGY. (3 Credits)
Agroecology incorporates ecological concepts and principles to the design and management of sustainable agricultural systems. Topics include: the role of insects in sustainable agricultural systems; application of the principles of insect ecology to better manage insect pests and maximize crop yield; conserving beneficial insects and other natural resources in agroecosystems and the surrounding landscape. CROSSLISTED as ENT 444/HORT 444 and ENT 544/HORT 544.
Equivalent to: ENT 544
Recommended: General background or previous course work in entomology.
HORT 547. ARBORICULTURE. (4 Credits)
The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. CROSSLISTED as FES 447/HORT 447 and FES 547/HORT 547.
Equivalent to: FES 547

HORT 552. BERRY AND GRAPE PHYSIOLOGY AND CULTURE. (4 Credits)
Production of wine grapes, caneberries, strawberries, blueberries, and other miscellaneous berry crops. Emphasis on plant growth and development; pruning and training systems; flower and fruit development and cultivars. Field trips required. Offered in alternate years.
Recommended: HORT 301

HORT 555. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)
Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as FES 455/HORT 455 and FES 555/HORT 555.
Equivalent to: FES 555, FOR 555
Recommended: FOR 350 or FES 350 or HORT 350

HORT 556. PHYSIOLOGY AND PRODUCTION OF BERRY CROPS. (4 Credits)
Physiology and production systems of blueberries, red and black raspberries, blackberries, and other berry crops. Emphasis on plant growth and development; flower and fruit development; cultivars; pruning and training systems; irrigation; harvesting; nutrient management; and conventional and organic production systems.

HORT 563. SEED BIOLOGY. (3 Credits)
Information about reproductive development of plants such as pollination and fertilization, which is important for the initiation of seed formation, will be provided. Embryo and endosperm development as well as accumulation of seed storage materials, which are major events during seed development, will be covered, as well as the dormancy and germination mechanisms in mature seeds. Lectures and discussions (presentations required for graduate students). Offered even years. Lec/lab. CROSSLISTED as CROP 463/HORT 463 and CROP 563/HORT 563.
Equivalent to: CROP 563, HORT 363

HORT 580. CASE STUDIES IN CROPPING SYSTEMS MANAGEMENT. (4 Credits)
Decision cases involving the production of field and horticultural crops; individual and group activities; discussion of the decision-making process. Multiple field trips required. A field trip fee will be charged. CROSSLISTED as CROP 480/HORT 480 and CROP 580/HORT 580.
Equivalent to: CROP 580
Recommended: CROP 300 or HORT 300

HORT 581. HORTICULTURE PRODUCTION CASE STUDIES. (4 Credits)
Field-based case studies investigate production issues encountered in horticultural crops; individual and group activities; discussion of processes for troubleshooting, decision-making and management recommendations; assessment of economic, practical and logistical feasibility. Prior knowledge of plant physiology, soils, entomology, and plant nutrition are required. Multiple field trips required. A field trip fee will be charged.
Recommended: HORT 301

HORT 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

HORT 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 99 credits.

HORT 605. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HORT 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Hospitality Management (HM)

HM 101. INTRODUCTION TO HOSPITALITY. (4 Credits)
Introduction to the food-service, lodging, and tourism components of the hospitality industry, and the essential leadership and management skills necessary for success in the field. Background information, current issues, and future challenges in various segments of the industry are included.

HM 210. HOSPITALITY INTERNSHIP. (3 Credits)
Students are required to complete this internship so that OSU and the sponsoring company can offer a platform from where students can apply the management concepts learned in class and acquire the necessary hands-on experience in a hotel, restaurant/food service and/or tourism industry to eventually qualify for a supervisory of managerial level role.
Prerequisites: HM 101 with C- or better

HM 230. LODGING MANAGEMENT. (4 Credits)
Provides a comprehensive introduction to the management of hotels and lodging properties. Focuses on operations, service, management and financials of the lodging industry.
Prerequisites: HM 101 with C- or better

HM 235. HOSPITALITY LAW AND LABOR RELATIONS. (4 Credits)
Provides insight into the laws and regulations governing the hospitality industry with an emphasis on labor relations and human resources best practices. Addresses the general concepts of tort, contracts, liability, risk management, employment practices, licensing and insurance needs. Explores the legal issues that today’s hospitality professionals face such as privacy, labor laws, the common law system for innkeepers and newer hospitality products in the shared economy such as AirBnB or VRBO.

HM 240. HOSPITALITY COST CONTROL. (4 Credits)
Introduces the basic techniques and control procedures used in the hospitality industry to maximize profit and minimize costs. Examines and discusses methods employed to protect and uphold the investors/owners strategic financial goals. Students will focus on all aspects of hospitality control objectives; from food and beverage costs, purchasing, labor costs, menu pricing, establishing room rates, cash flow, theft and loss prevention, to computer applications. The principles of effective budgeting, important hospitality financial ratios and the factors that determine hospitality profitability will also be reviewed.
HM 310. INTERNSHIP II. (3 Credits)
Hospitality Internship II builds on the knowledge students have gained from their course work internship (HM 210). Students are required to complete this internship in a hotel, restaurant/food service and/or related hospitality sector. In cooperation with OSU and the sponsoring company, students will apply the HM concepts learned in class to a real-world environment.

HM 320. SERVICE AUTOMATION AND TECHNOLOGY. (4 Credits)
Students discover the basic concepts of hospitality technology and service automation. The hospitality industry continues to see significant changes in all facets of business due to changing customer expectations, new and cheaper technology, and a challenging labor market. The result of these forces has led the hospitality industry to increasingly turn to automation of basic job tasks to stay competitive. Examines new technologies shaping the hospitality industry and how industry leaders are taking advantage of these new technologies to improve efficiency and service.

HM 321. HOSPITALITY TECHNOLOGY LABORATORY. (4 Credits)
Technology is critical to attracting, servicing and retaining hospitality customers. The Hospitality Technology Lab course introduces the student to each facet of technology in the industry. The course provides an opportunity for hands-on practical experience with the latest technology. At the end of the course, the student will have a basic working knowledge of Food 3D printers, hotel property management systems, global distribution systems, booking engines, revenue management solutions and other automation tools like Botlr.

HM 325. ONLINE MARKETING AND REPUTATION MANAGEMENT. (4 Credits)
Students are introduced to Online Internet Marketing techniques in the hospitality industry. The course will focus on online marketing, advertising strategies and the importance of a strong internet presence in order to maximize revenue. The course will show how organizations can encourage & capitalize on customer generated content practices to effectively retain customers and generate recurring revenue streams.

HM 340. VACATION PROPERTY MANAGEMENT. (4 Credits)
The vacation property market is one of the largest segments of the hospitality industry and is forecast to grow further over the next ten years. This course looks at each facet of this market including property development, contracts, management, promotion and financing. The course also explores the additional challenges and opportunities associated with the shared economy such as managing owner relations, homeowner associations, renovations and public policy.

HM 399. SPECIAL TOPICS. (4 Credits)
This course is repeatable for 16 credits.

HM 410. HOSPITALITY INTERNSHIP III. (3 Credits)
Hospitality Internship III builds on the knowledge the students have gained from their course work and their previous internships (HM 210 & HM 310). Students are required to complete this internship in a hotel, restaurant/food service and/or related hospitality sector. In cooperation with OSU and the sponsoring company, students apply the HM concepts learned in class to a real-world environment.
Prerequisites: HM 310 with C- or better

HM 420. REVENUE MANAGEMENT AND PRICING. (4 Credits)
Revenue management is critical to the hospitality industry due to the perishable nature of a service-based product. The fundamental principles and concepts of revenue management covered are capacity management, duration control, demand and revenue forecasting, discounting, overbooking practices, displacement analysis, channel management, and pricing execution.

HM 425. ADVANCED RESTAURANT MANAGEMENT AND OWNERSHIP. (4 Credits)
Covers concept development, design and funding of a new restaurant, and best practices in operations and management of a full-service foodservice operation. Intended for students wishing to develop their knowledge of foodservice entrepreneurship, creation, operations and management/ownership.

HM 430. SERVICE MANAGEMENT. (4 Credits)
With growing access to information and alternative products, customers can choose where to do business based on the level of service they receive. This course will study and analyze service delivery systems for the hospitality industry with particular emphasis on implementing a consumer driven quality service program. This course will review customer service philosophy and techniques. Quality issues, service design and delivery, customer interaction systems, complaint handling and service recovery are also addressed.

HM 460. HOSPITALITY INVESTMENT AND ASSET MANAGEMENT. (4 Credits)
Covers the principles of hospitality investment and asset management. Provides future hospitality owners/executives with the tools and knowledge to evaluate real estate investments in new hospitality ventures. Tools for financial analysis and assessment, debt and equity financing (public and private), and the use of industry benchmarks are discussed and practiced. Students explore the financial feasibility of a specific hospitality investment while considering financial risk, new income streams, competitor analysis and market forecasting, investment and asset management.

HM 470. ADVANCED HOSPITALITY. (4 Credits)
Capstone course for the hospitality management degree. Provides students with an in-depth understanding of the importance of core competencies in the hospitality and tourism industry. A broader interpretation of the hospitality industry is gained and the student will discover new and innovative practices within the industry. Students will apply the knowledge gained in this course and the program as a whole to a capstone project with an industry partner. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

Human Dev and Family Sciences (HDFS)

HDFS 101. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 107. INTRODUCTION TO HUMAN SERVICES. (3 Credits)
An exploration of the human services profession. Emphasis on prevention and early intervention concepts and programs. Development of internship search skills, including an introduction to a wide range of human services organizations.
Equivalent to: HDFS 262

HDFS 199. SPECIAL PROJECTS. (1-16 Credits)
Special projects designed with instructor Graded P/N.
This course is repeatable for 16 credits.

HDFS 201. *CONTEMPORARY FAMILIES IN THE U.S.. (3 Credits)
An introduction to families with application to personal life. Focuses on diversity in family structure, social class, race, gender, work and other social institutions. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: FCS 201
HDFS 209. HUMAN SERVICES PRACTICUM. (4 Credits)
Field experience to learn, primarily through observation, how to apply human service strategies and skills to helping individuals and families served by professional agencies. Supervision by agency and instructor. Requires 90 hours of work on-site. Seminar introduces basic theories and skills through readings, discussion and reflective exercises.
Prerequisites: HDFS 107 with C- or better
This course is repeatable for 8 credits.

HDFS 240. *HUMAN SEXUALITY. (3 Credits)
Physiological, psychological, social, and historical influences on sexuality; emphasis on developmental and relationship aspects. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

HDFS 262. INTRODUCTION TO HUMAN SERVICES. (3 Credits)
An exploration of the human services profession. Emphasis on prevention and early intervention concepts and programs. Development of internship search skills, including an introduction to a wide range of human services organizations.
Equivalent to: HDFS 107

HDFS 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 300. HUMAN SERVICES PRACTICUM. (4 Credits)
Field experience to learn, primarily through observation, how to apply human service intervention strategies and skills to helping individuals and families served by professional agencies and organizations. Supervision by agency and instructor. Requires 90 hours of work on-site. Supplementary bi-weekly seminar, readings, and reports. Graded P/N.
Prerequisites: HDFS 262 with C- or better
Equivalent to: HDFS 209
This course is repeatable for 8 credits.

HDFS 311. INFANT AND CHILD DEVELOPMENT. (4 Credits)
Research and theory on development from infancy through middle childhood. Discussion of biological, familial, and sociocultural influences. Development of skills in observing children’s behavior.
Equivalent to: HDFS 211

HDFS 312. PARENTING RESEARCH AND APPLICATION. (4 Credits)
Research and theory regarding parenting and parent education, including parenting styles and practices, discipline, parent-child interactions, attachment, and the family context with an emphasis on professional implications for promoting child health and well-being.
Equivalent to: HDFS 312X

HDFS 313. ADOLESCENT DEVELOPMENT. (4 Credits)
Advanced theories and research on physical, social and psychological development during adolescence; emphasizes influences of family, peers, schools, and community.

HDFS 314. ADULT DEVELOPMENT AND AGING. (4 Credits)
Advanced theories and research related to developmental changes and stability in early, middle, and late adulthood. Gender issues, personality, cognition, and adaptation.

HDFS 330. FOSTERING LEARNING IN EARLY CHILDHOOD DEVELOPMENT. (4 Credits)
Development of skills in applying theoretical approaches to observing, recording, and interpreting the behavior of young children in order to design interactions that support learning in group settings.
Prerequisites: HDFS 311 with C- or better

HDFS 331. DIRECTED EXPERIENCE IN EARLY CHILDHOOD. (3 Credits)
Placement in early childhood program to focus on guidance techniques, classroom management, and implementation of curricula, based on developmental observation, research, and theory. Supplementary weekly seminar, readings, and reports. Lab/rec. Taught on the OSU-Cascades campus only.
Prerequisites: (HDFS 311 with C- or better or HDFS 211 with C- or better) and HDFS 330 [C-
Equivalent to: HDFS 330

HDFS 341. FAMILY STUDIES. (4 Credits)
Study of family forms, family formation, and family change over the human life course is sociohistorical, economic, political, and cultural context.

HDFS 360. CRITICAL THINKING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (4 Credits)
Explores foundations of critical thinking, especially methods for sustaining open-minded inquiry and evaluating evidence and arguments. Current controversies in human development and family policy are targets of debate.

HDFS 361. APPLIED RESEARCH METHODS. (4 Credits)
Basic research methods as they are applied in human development and family studies.

HDFS 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 401. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 405. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 406. PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 410. HUMAN SERVICES INTERNSHIP. (6-12 Credits)
Field experience to apply theory and evidence-based practices to individual, family, and community problems in professional settings. Supervision by agency and instructor. Requires 300 hours of work on-site. Seminar includes reflection and constructive criticism processes. Can be taken across 2 consecutive terms (150 hours each) within the same agency. Graded P/N.
Prerequisites: HDFS 107 with C- or better and HDFS 209 [P] and HDFS 462 [C-]
This course is repeatable for 12 credits.

HDFS 430. *CHILD DEVELOPMENT CENTER INTERNSHIP. (12 Credits)
Participation in a research-based model early childhood program focused on student teaching, program development and evaluation, parent education and administration. Placement to be reserved one year in advance. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: HDFS 330 with C- or better
HDFS 431. FAMILY, SCHOOL, AND COMMUNITY COLLABORATION. (3 Credits)
Focus on family, school, community environments and interactions for children from infancy to adolescence. Resources and skills for enhancing child development across these settings are emphasized.
Prerequisites: HDFS 311 with C- or better or HDFS 313 with C- or better
Equivalent to: HDFS 436
HDFS 432. CHILDREN AND YOUTH WITH DISABILITIES. (3 Credits)
Developmental, educational, and family issues related to children and youth with disabilities. Highlights a broad range of human exceptionality, including giftedness.
Equivalent to: HDFS 420
Recommended: 6 credits of HDFS, SOC or PSY.
HDFS 433. EARLY CHILDHOOD INTERNSHIP. (10 Credits)
Students will complete an internship in a Pre-Kindergarten, Kindergarten or First Grade classroom and will focus on curriculum development, implementation and evaluation, individualizing for diverse student needs and communication with students.
Prerequisites: HDFS 311 with C- or better and HDFS 330 [C-] and HDFS 331 [C-]
Recommended: HDFS 261
HDFS 444. FAMILY VIOLENCE AND NEGLECT. (4 Credits)
Examination of the causes and consequences of family abuse and neglect, including child abuse, domestic violence and elder abuse.
Recommended: 6 credits of HDFS, SOC or PSY.
HDFS 447. *FAMILIES AND POVERTY. (4 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HDFS 446, HDFS 447H
HDFS 447H. *FAMILIES AND POVERTY. (4 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families. Community service required. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: HDFS 446, HDFS 447H
HDFS 460. FAMILY POLICY. (4 Credits)
Family policies aim to protect, promote, and strengthen families by addressing one or more of the five explicit functions families perform: (a) family formation, (b) partner relationships, (c) economic support, (d) childrearing, and (e) caregiving. This course will explore the relationships between family policies and family functioning using state, federal, and international policy examples. By reviewing theoretical frameworks for conceptualizing family policy, students will assess the consequences policies may have for family well-being.
HDFS 461. *PROGRAM DEVELOPMENT AND PROPOSAL WRITING. (4 Credits)
Principles of program development and evaluation applied to the development of a proposal for a human services program; analysis of needs and resources, identification of empirically-based strategies, and assessment. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: HDFS 360 with C- or better and HDFS 361 [C-]
HDFS 462. PROFESSIONAL HELPING SKILLS. (4 Credits)
Exploration of collaborative, strengths-based methods to resolve individual, family, and community problems. Application of ethical standards to case study, with emphasis on the values of human dignity and social justice. Development of basic helping skills within an empowerment framework.
Prerequisites: HDFS 262 with C- or better and HDFS 310 [P]
HDFS 465. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
Equivalent to: HDFS 465H
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY.
HDFS 465H. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
Attributes: HNRS – Honors Course Designator
Equivalent to: HDFS 465
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY.
HDFS 499. SPECIAL TOPICS. (1-16 Credits)
Prerequisites: HDFS 262 with C- or better and HDFS 310 [P]
Equivalent to: HDFS 499H
This course is repeatable for 16 credits.
HDFS 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: HDFS 499
This course is repeatable for 16 credits.
HDFS 501. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.
HDFS 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.
HDFS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
HDFS 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.
HDFS 506. SPECIAL PROBLEMS/SPECIAL PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.
HDFS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
HDFS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
HDFS 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.
HDFS 510. INTERNSHIP. (3-15 Credits)
This course is repeatable for 16 credits.
HDFS 511. THEORIES OF HUMAN DEVELOPMENT. (4 Credits)
Critical examination of significant theories of human development. Emphasizes evolution of theories and impact on current human development research.
HDFS 516. CHILD DEVELOPMENT. (4 Credits)
Study of theories, concepts, and issues related to physical, cognitive, social, and emotional development in infants and children. Covers family contexts, risk and resilience, nature/nurture issues, critical/sensitive periods, the importance of early experience, and the relationship between basic and applied research.
Recommended: 15 quarter credits of social and behavioral sciences.

HDFS 517. ADOLESCENT DEVELOPMENT. (4 Credits)
Study of theories, concepts, and issues related to biological, cognitive, social, and emotional development in adolescents. Covers identity formation, family contexts, adolescent sexuality, societal contexts for adolescent development, and risk and resilience processes.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 518. ADULT DEVELOPMENT AND AGING. (4 Credits)
Study of theories, concepts, and issues related to biological, cognitive, social, and emotional development throughout adulthood. Covers life transitions, stress-related growth, optimal aging, wisdom, and developmental methods.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 519. THE LIFE COURSE. (4 Credits)
Introduces students to key concepts, principles, and controversies in life-course studies. Emphasizes how the nature and rhythm of the life course is structured by time and place. Examines how the lives of individuals and groups are shaped by history, demography, social institutions, states and policies, and culture.

HDFS 529. INTRODUCTORY DATA ANALYSIS WITH SAS. (1 Credit)
Introduction to basic statistical concepts and the use of the SAS software for data analysis. Graded P/N.

HDFS 530. RESEARCH IN HUMAN DEVELOPMENT AND FAMILY SCIENCES I. (4 Credits)
An overview of research design, measurement, sampling and evaluation research. Introduces computer applications for data collection and analysis. Lec/lab.
Recommended: Undergraduate statistics and 12 credits of social science courses.

HDFS 531. APPLIED QUANTITATIVE METHODS I: ANOVA. (4 Credits)
Principles and application of general linear models for categorical predictors and repeated measures designs (e.g., ANOVA).
Prerequisites: HDFS 529 with B- or better

HDFS 532. APPLIED QUANTITATIVE METHODS II: LINEAR REGRESSION. (4 Credits)
Principles and application of general linear models for continuous predictors (e.g., multiple regression).
Prerequisites: HDFS 531 with B- or better
Equivalent to: HDFS 632

HDFS 533. SOCIAL POLICY AND HUMAN DEVELOPMENT. (4 Credits)
Probes how policies and governments affect human development over the life course. Examines experiences in family, education, work, and health. Families are a central lens for examining effects. Offered alternate years.
Equivalent to: HOEC 533

HDFS 534. SOCIAL PROGRAM AND POLICY EVALUATION. (4 Credits)
Models of evaluation and application of applied research methods to social programs and policies.
Prerequisites: HDFS 531 with C or better
Equivalent to: HOEC 534

HDFS 538. QUALITATIVE RESEARCH METHODS I. (4 Credits)
Critical survey of qualitative approaches in social science research. Examines historical roots, epistemological perspectives, and ethical issues. Includes ethnographic and observational methods, interview, grounded theory, case study, and participatory approaches.
Equivalent to: HDFS 635
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 539. QUALITATIVE METHODS II. (4 Credits)
Critical survey of qualitative approaches in social science research. Examines historical roots, epistemological perspectives, and ethical issues. Includes ethnographic and observational methods, interview, grounded theory, case study, and participatory approaches. Application of qualitative methods through completion of a qualitative research project.
Prerequisites: HDFS 538 with C or better

HDFS 541. FAMILY STUDIES. (4 Credits)
Critical survey of current research in family studies with a focus on diverse family structures and processes.
Recommended: 15 quarter credits of behavioral and social sciences.

HDFS 546. THEORIES OF FAMILY STUDIES. (4 Credits)
An overview of the major theoretical perspectives used in the study of families. Issues of theory construction and evaluation are also covered. Course goal is to enable the student to apply conceptual frameworks to a particular area of interest.
Equivalent to: HDFS 547

HDFS 547. FAMILIES AND POVERTY. (3 Credits)
Examines families in poverty focusing on causes and consequences of family poverty, including global economic factors, migration patterns, discrimination, and policies and programs for families.
Equivalent to: HDFS 546

HDFS 565. TOPICS IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (3 Credits)
Topics and issues in human development and family sciences. Examples: children and the law; gender and families; parenting; aging; relationship development across the lifespan.
This course is repeatable for 18 credits.
Recommended: 6 credits of HDFS, SOC or PSY.

HDFS 587. SOCIAL GERONTOLOGY. (3 Credits)
An introduction to aging research targeted toward understanding demographics of aging societies, lifespan theories, methods of aging research, psychosocial aging processes, family and caregiving issues, housing and long-term care, and current social policies.

HDFS 601. RESEARCH. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 602. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

HDFS 605. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 606. SPECIAL PROJECTS. (1-6 Credits)
This course is repeatable for 16 credits.

HDFS 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

HDFS 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
HDFS 610. PRACTICUM/INTERNSHIP. (3-15 Credits)
This course is repeatable for 16 credits.

HDFS 616. ADVANCED TOPICS IN CHILD-adoLESCENT DEVELOPMENT. (3 Credits)
Advanced critical study of theory and research related to specific topics of social, emotional, and cognitive development during infancy, childhood and/or adolescence.
This course is repeatable for 6 credits.

HDFS 617. ADVANCED TOPICS IN ADULT DEVELOPMENT AND AGING. (3 Credits)
Advanced critical study of theory and research related to specific topics of social and emotional development and stability in adulthood, including later life.
This course is repeatable for 9 credits.

HDFS 630. QUANTITATIVE METHODS IN FAMILY AND INDIVIDUAL DEVELOPMENT. (3 Credits)
Advanced quantitative techniques in human development and family studies. Includes longitudinal designs, structural equation modes. Content varies with each offering.
Prerequisites: HDFS 532 with B- or better
This course is repeatable for 9 credits.

HDFS 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotions.
Recommended: 9 credits of public health or HDFS graduate coursework

HDFS 655. TEACHING IN HUMAN DEVELOPMENT AND FAMILY SCIENCES. (1 Credit)
Principles and practices of pedagogy in human development and family sciences related to both on-campus and Ecampus instruction. Graded P/N.
This course is repeatable for 6 credits.

HDFS 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging of African-American, Latino, and Asian-Pacific Islander elderly. Taught spring
This course is repeatable for 9 credits.

HDFS 689. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 8 credits.

HDFS 808. WORKSHOP. (1-16 Credits)
PREREQ: Application to Early Childhood Leadership Directions.
This course is repeatable for 16 credits.

Humanitarian Engr Sci & Tech (HEST)

HEST 199. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 241. HOUSEHOLD ENERGY IN GUATEMALA: BACKGROUND. (1 Credit)
An introduction to the technical, social, environmental, and economic issues surrounding energy needs for households in developing countries and the technologies and policies needed to help address them. Students are introduced to concepts about global development, needs assessment and co-design, qualitative and quantitative evaluation, and local socioeconomic conditions. This course is preparation for the 10-day Summer HEST 242 faculty-led study abroad course in Guatemala. Students from any major are invited to participate in this multidisciplinary course series.

HEST 242. HOUSEHOLD ENERGY IN GUATEMALA: APPLICATIONS. (3 Credits)
Through immersion in rural communities during this 10-day interdisciplinary study abroad course, students will gain a deeper understanding of household energy needs in developing countries, as well as the social, environmental, technical, and economic issues surrounding technologies and polices to help meet these needs. The outcomes produced by a variety of household technologies such as biomass cookstoves will be evaluated through qualitative and quantitative data gathering, including experiments, observations, and surveys, giving students the chance to practice their research and cross-cultural communication skills under a variety of circumstances.
Recommended: HEST 241

HEST 299. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 310. *INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-BASED DESIGN. (3 Credits)
Includes study of civic problems and issues, design-thinking concepts and application to co-design of engineering, science and technology-based solutions with social impact, and development of dispositions for effective community engagement through field study and service-learning. Recommended course for student wanting to complete a HEST internship. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 320. *ENGINEERING FOR GLOBAL HEALTH SOLUTIONS. (3 Credits)
An introduction to the critical processes and drivers involved in the development of engineering solutions to address global health problems. Topics include world health challenges, accessing and interpreting health and economic data, basic healthcare systems around the world, the importance of ethical guidelines in ensuring the protection of human subjects, the process of cost effectiveness assessment of a technology, and the timescale and hurdles to adoption of a technology. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 399. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 411. ENGINEERING DESIGN FOR EMERGENCY & LOW-RESOURCE ENVIRONMENTS. (3 Credits)
Introduces the challenges of engineering in emergency and low-resource environments, concepts of appropriate technologies and response, and engineering design of discrete services and technologies such as water systems, environmental health systems and infrastructure.
Recommended: Completion of an undergraduate engineering fluid mechanics course
HEST 412. *MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY. (3 Credits)
Introduces students to multidisciplinary methods and perspectives applied to case studies in humanitarian engineering, science and technology. Applications to real world issues with global implications at the interface of humanity and nature are addressed from a systems perspective using a case study approach.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 499. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 511. ENGINEERING DESIGN FOR EMERGENCY & LOW-RESOURCE ENVIRONMENTS. (3 Credits)
Introduces the challenges of engineering in emergency and low-resource environments, concepts of appropriate technologies and response, and engineering design of discrete services and technologies such as water systems, environmental health systems and infrastructure.
Recommended: Completion of an undergraduate engineering fluid mechanics course

HEST 512. MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN ENGINEERING, SCIENCE AND TECHNOLOGY. (3 Credits)
Introduces students to multidisciplinary methods and perspectives applied to case studies in humanitarian engineering, science and technology. Applications to real world issues with global implications at the interface of humanity and nature are addressed from a systems perspective using a case study approach.

HEST 541. HOUSEHOLD ENERGY IN GUATEMALA: BACKGROUND. (1 Credit)
An introduction to the technical, social, environmental, and economic issues surrounding energy needs for households in developing countries and the technologies and policies needed to help address them. Students are introduced to concepts about global development, needs assessment and co-design, qualitative and quantitative evaluation, and local socioeconomic conditions. This course is preparation for the 10-day Summer HEST 542 faculty-led study abroad course in Guatemala. Students from any major are invited to participate in this multidisciplinary course series.

HEST 542. HOUSEHOLD ENERGY IN GUATEMALA: APPLICATIONS. (3 Credits)
Through immersion in rural communities during this 10-day interdisciplinary study abroad course, students will gain a deeper understanding of household energy needs in developing countries, as well as the social, environmental, technical, and economic issues surrounding technologies and policies to help meet these needs. The outcomes produced by a variety of household technologies such as biomass cookstoves will be evaluated through qualitative and quantitative data gathering, including experiments, observations, and surveys, giving students the chance to practice their research and cross-cultural communication skills under a variety of circumstances.
Recommended: HEST 541

HEST 599. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

Industrial and Mfg Engineering (IE)

IE 112. SPREADSHEET SKILLS FOR INDUSTRIAL & MANUFACTURING ENGINEERS. (1 Credit)
Basic spreadsheet functionality needed to create spreadsheet applications for common industrial and manufacturing engineering information processing tasks, including simple databases, statistical analysis, quality control, forecasting, production planning and control, and operations analysis and improvement. Topics include creating spreadsheets, formatting, data types, formulas, charts, user-defined functions, and pivot tables.

IE 199. SPECIAL TOPICS. (1-16 Credits)
Special topics in industrial engineering.
This course is repeatable for 16 credits.

IE 212. COMPUTATIONAL METHODS FOR INDUSTRIAL ENGINEERING. (4 Credits)
Prerequisites: ENGR 112 with C or better and IE 112 (may be taken concurrently) [C]
Recommended: Algebra, calculus, differentiation and integration

IE 255. INTRODUCTORY QUANTITATIVE ANALYSIS OF INDUSTRIAL AND MANUFACTURING SYSTEMS. (3 Credits)
An introduction to basic analysis concepts that will be utilized in subsequent industrial and manufacturing engineering courses. Emphasis will be placed on fundamental concepts such as data collection, commonly applied quantitative analysis methods, and how these are utilized to support decisions in different industrial and manufacturing system applications. Examples include resource utilization calculations, equipment fraction equations, queuing models, basic statistical inference procedures, and probability models used in discrete event simulation.
Prerequisites: MTH 252 with C or better

IE 285. INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING. (3 Credits)
Introduction to selected topics in industrial and manufacturing engineering, including history and philosophy, product design and manufacturing cycle, integrate role of engineering and business, and multi-objective nature of organizations. Surveys of selected design problems in resource allocation, operations and quality management, and production engineering. CROSSLISTED as IE 285/MFGE 285.
Prerequisites: IE 112 (may be taken concurrently) with C or better or FOR 112 (may be taken concurrently) with C or better
Equivalent to: MFGE 285

IE 299. SPECIAL TOPICS. (1-16 Credits)
Special topics in industrial engineering.
This course is repeatable for 16 credits.

IE 355. STATISTICAL QUALITY CONTROL. (4 Credits)
Control of quality through the use of statistical analysis; typical control techniques and underlying theory. Development of reliability models and procedures for product assurance. Lec/lab.
Prerequisites: IE 255 with C or better or ST 314 with C or better
Equivalent to: IE 351
IE 356. EXPERIMENTAL DESIGN FOR INDUSTRIAL PROCESSES. (4 Credits)
Systematic analysis of processes through the use of statistical analysis, methods, and procedures. Application of statistical techniques including use of classic process analysis techniques, regression and design of experiments. Lec/rec.
Prerequisites: IE 255 with C or better or ST 314 with C or better
Equivalent to: IE 352

IE 366. WORK SYSTEMS ENGINEERING. (4 Credits)
Principles and techniques of work measurement, methods engineering, workplace design, work sampling, and predetermined time systems. Basic human factors engineering and ergonomics principles applied to workplace design. The work systems engineering process. Lec/lab/rec.
Prerequisites: (IE 255 with C or better or ST 314 with C or better) and PH 212 [C] and PH 213 [C]
Equivalent to: IE 341

IE 367. PRODUCTION PLANNING AND CONTROL. (4 Credits)
Forecasting techniques, inventory analysis, master production scheduling, material and capacity requirements, planning and scheduling methods.
Prerequisites: IE 255 with C or better or ST 314 with C or better
Equivalent to: IE 362

IE 368. FACILITY DESIGN AND OPERATIONS MANAGEMENT. (4 Credits)
Design and analysis of industrial facilities including just-in-time systems, queuing, material handling systems, material flow analysis, line balancing, systematic layout planning, design of warehouse facilities, and facilities location.
Prerequisites: ENGR 248 with C or better and (IE 255 [C] or ST 314 [C])
Equivalent to: IE 365

IE 380. THE RESPONSIBLE ENGINEER. (3 Credits)
The idea of responsibility and the ethical responsibilities of the engineer. Introduction to value, ethics, and ethical systems. Engineering as value creation and the ethical ramifications of engineering. Codes of engineering ethics. Recognizing and addressing ethical dilemmas in engineering. Examination of the individual, social, and environmental effects of engineering and technology. (Baccalaureate Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

IE 399. SPECIAL TOPICS. (1-16 Credits)
Special topics in industrial engineering. This course is repeatable for 16 credits.

IE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

IE 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IE 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

IE 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

IE 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

IE 411. VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS. (4 Credits)
Object-oriented modeling, Unified Modeling Language, software development concepts, file and database connectivity, and visual programming skills (Microsoft Visual Basic) for use in developing industrial applications, such as process monitoring and supply chain management.
Prerequisites: IE 212 with C or better
Equivalent to: IE 414

IE 412. INFORMATION SYSTEMS ENGINEERING. (4 Credits)
Framework for enterprise information systems. Engineering and scientific systems. Requirements definition, enhanced entity relationship modeling, logical modeling, structured query language, relational model, referential integrity. Lec/lab.
Prerequisites: IE 212 with C or better

IE 415. SIMULATION AND DECISION SUPPORT SYSTEMS. (4 Credits)
Analysis of operations and production systems through the application of computer simulation modeling techniques. Fundamentals of computer simulation including random number generation, input/output data analysis, model validation and verification. Lec/lab.
Prerequisites: IE 112 with C or better and (IE 255 [C] or ST 314 [C])

IE 418. TELECOMMUNICATION CONCEPTS. (3 Credits)
Telecommunication concepts for industrial applications. OSI reference model, local area networks, wide area networks, internet architecture. Taught fall in even years.
Prerequisites: IE 212 with C or better
Recommended: Previous programming experience

IE 419. WIRELESS NETWORKS. (3 Credits)
RF fundamentals, ISO 802.11 standards, spread spectrum technology, narrow band technology, direct sequence and frequency hopping transmission schemes, electromagnetic interference, design of indoor wireless networks.
Prerequisites: IE 418 with C or better

IE 425. INDUSTRIAL SYSTEMS OPTIMIZATION. (4 Credits)
A first course in operations research. Topics include mathematical programming formulations and solutions, the simplex method, network optimization, introduction to metaheuristics, and linear programming under uncertainty.
Prerequisites: (IE 255 with C or better or ST 314 with C or better) and (MTH 306 [C] or MTH 341 [C])
Equivalent to: IE 421, IE 422

IE 426. STOCHASTIC MODELS OF INDUSTRIAL SYSTEMS. (4 Credits)
The application of probabilistic and stochastic modeling methodologies to analyze the performance of production and service systems. Major topics include probability models for space planning, Poisson arrival processes, discrete and continuous time Markov chain models of machine cycle times, and queuing models applied to various industrial systems. Other applications of these tools to model inventories, process behavior, and equipment reliability is illustrated.
Prerequisites: (IE 255 with C or better or ST 314 with C or better) and IE 425 [C]

IE 470. MANAGEMENT SYSTEMS ENGINEERING. (4 Credits)
Improvement of organizational performance through the design and implementation of systems that integrate personnel, technological, environmental, and organizational variables. Topics include performance assessment and measurement as well as improvement methodologies.
Prerequisites: ENGR 390 with C or better and IE 355 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C]
Equivalent to: IE 474
IE 471. PROJECT MANAGEMENT IN ENGINEERING. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Time, cost, and performance parameters are analyzed from the organizational, people, and resource perspectives. Network optimization and simulation concepts are introduced. Resource-constrained project scheduling case discussions and a term project are included.
Prerequisites: ENGR 390 with C or better and IE 355 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C]

IE 475. ADVANCED MANUFACTURING COSTING TECHNIQUES. (3 Credits)
Costing techniques applicable in advanced manufacturing enterprises: activity-based costing, economic value added, Japanese cost management techniques, life cycle costing, throughput accounting, cost of quality, and financial versus operational performance measures. Emphasis on linkages to such advanced manufacturing systems as cellular manufacturing, flexible manufacturing, JIT, Lean, and ERP.
Prerequisites: ENGR 390 with C or better and IE 355 [C] and IE 366 [C] and IE 367 [C] and IE 368 [C]
Equivalent to: IE 495

IE 499. SPECIAL TOPICS. (1-5 Credits)
Recent advances in industrial engineering pertaining to the theory and application of system studies. Analysis and design of natural resource systems; evaluation; detection extraction; processing and marketing systems; advanced design of production systems with reference to social, economic, and regional planning; human engineering studies of man-machine systems; applications of operations research techniques. Nonsequence course. Not offered every term.
This course is repeatable for 99 credits.

IE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

IE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IE 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

IE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

IE 511. VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS. (4 Credits)
Object-oriented modeling, Unified Modeling Language, software development concepts, file and database connectivity, and visual programming skills (Microsoft Visual Basic) for use in developing industrial applications, such as process monitoring and supply chain management.
Equivalent to: IE 514
Recommended: IE 212

IE 512. INFORMATION SYSTEMS ENGINEERING. (4 Credits)
Framework for enterprise information systems. Engineering and scientific systems. Requirements definition, enhanced entity relationship modeling, logical modeling, structured query language, relational model, referential integrity. Lec/lab.

IE 515. SIMULATION AND DECISION SUPPORT SYSTEMS. (4 Credits)
Analysis of operations and production systems through the application of computer simulation modeling techniques. Fundamentals of computer simulation including random number generation, input/output data analysis, model validation and verification. Lec/lab.
Recommended: ST 314

IE 518. TELECOMMUNICATION CONCEPTS. (3 Credits)
Telecommunication concepts for industrial applications. OSI reference model, local area networks, wide area networks, internet architecture. Taught fall in even years.
Recommended: IE 212 and previous programming experience.

IE 519. WIRELESS NETWORKS. (3 Credits)
RF fundamentals, ISO 802.11 standards, spread spectrum technology, narrow band technology, direct sequence and frequency hopping transmission schemes, electromagnetic interference, design of indoor wireless networks.
Prerequisites: IE 518 with C or better

IE 521. INDUSTRIAL SYSTEMS OPTIMIZATION I. (3 Credits)
Techniques for analysis and solution of problems in industrial and management systems. Emphasis on application of linear and integer programming and extensions.
Equivalent to: IE 525
Recommended: MTH 341

IE 522. INDUSTRIAL SYSTEMS OPTIMIZATION II. (3 Credits)
Techniques for analysis and solution of problems in industrial and management systems. Emphasis on applications of dynamic programming. Markovian processes, and questions as applied to industrial problems.
Recommended: ST 314

IE 523. INTEGER PROGRAMMING. (3 Credits)
Classic models and algorithms for discrete optimization. Includes intuition and theory about computational strategies for solution of integer programming and combinatorial optimization problems.
Prerequisites: IE 521 with C or better

IE 533. HUMAN ANALYTICS AND BEHAVIORAL OPERATIONS. (3 Credits)
Introduces several quantitative applications related to determining workforce size, skill-sets, and multi-functionality in service and manufacturing systems based on measurable quality and productivity performance, at the intersection of human factors engineering and production planning. Modeling and solving problems in a context of the speed and accuracy trade-off. Models include learning, forgetting, teamwork, fatigue, procrastination, and individual difference measures.
Recommended: Introductory math programming

IE 542. DESIGN OF HUMAN FACTORS / ERGONOMICS EXPERIMENTS. (4 Credits)
Designed to provide graduate students with introductions to a broad range of methods appropriate for studying humans, tasks, environments and their interaction along with various topics in the area of Human Factors/Ergonomics. Reading/discussion format.
Recommended: Graduate level statistics course

IE 545. HUMAN FACTORS ENGINEERING. (4 Credits)
Analysis and design of work systems considering human characteristics, capabilities and limitations. Analysis and design of displays, controls, tools, and workstations. Human performance analysis. Human factors research methods.
Equivalent to: IE 541
IE 546. HUMAN-MACHINE SYSTEMS ENGINEERING. (3 Credits)
Development of safe, high performance human-machine systems. System/function/task analysis, function allocation, design, mockups and rapid prototyping, human factors test and evaluation. Critical examination of the human-factors and domain-specific literature to identify human factors problems, and knowledge and methods to address those problems.
Equivalent to: IE 542
Recommended: IE 545

IE 548. COGNITIVE ENGINEERING. (3 Credits)
Theories and models of human sensory, cognitive, and motor performance pertaining to the operation of complex systems. Applications to human-machine systems engineering. Research topics and methods related to cognitive engineering.
Recommended: IE 545

IE 552. DESIGN OF INDUSTRIAL EXPERIMENTS. (3 Credits)
A first course in design of experiments with an emphasis on applications and fundamental data analysis methods. Basic statistical inference, analysis of variance, blocking, general factorial designs, and two-level factorial designs are covered.
Recommended: ST 314

IE 553. DESIGN OF INDUSTRIAL EXPERIMENTS II. (3 Credits)
This second course in design of experiments is a continuation of IE 552. The same textbook is used. Topics covered include two-level fractional factorial designs, regression models, response surface methods, rules for expected sum of squares and expected mean squares, a summary of the 'no-name' approach to DOE, and analysis of experiments with unbalanced data (time permitting).
Prerequisites: IE 552 with C or better

IE 556. DESIGN AND SCHEDULING OF CELLULAR MANUFACTURING SYSTEMS. (3 Credits)
Recommended: Computer experience

IE 570. MANAGEMENT SYSTEMS ENGINEERING. (4 Credits)
Improvement of organizational performance through the design and implementation of systems that integrate personnel, technological, environmental, and organizational variables. Topics include performance assessment and measurement as well as improvement methodologies.
Equivalent to: IE 574

IE 571. PROJECT MANAGEMENT IN ENGINEERING. (3 Credits)
Critical issues in the management of engineering and high-technology projects are discussed. Time, cost, and performance parameters are analyzed from the organizational, people, and resource perspectives. Network optimization and simulation concepts are introduced. Resource-constrained project scheduling case discussions and a term project are included.

IE 575. SYSTEMS THINKING THEORY AND PRACTICE. (4 Credits)
An introduction to systems science theory and practice. Systems science theory is explored through the fundamentals of systems thinking theory, and theory of knowledge. Systems science practice is explored through system dynamics modeling techniques for simulating socio-technical systems, structures, and processes.

IE 581. OPERATIONS MANAGEMENT. (4 Credits)
Critical and current issues on the implementation of operations management strategies for the engineering manager. Includes aspects of operations in an engineering management environment such as work systems design, forecasting, strategy, facilities location and design, management of quality and resources planning and management.
Prerequisites: IE 582 with B or better
Recommended: IE 571

IE 582. INTRODUCTION TO MANAGEMENT FOR ENGINEERS AND SCIENTISTS. (4 Credits)
An introduction to concepts, tools, and practices necessary for a broad understanding of the roles of engineering and technical managers. A mix of research results, case studies, and experiential learning is used to bolster theories of management, with focus on technical organizations.

IE 583. ADVANCED ENGINEERING ECONOMICS ANALYSIS. (4 Credits)
Examines the economics dimension of engineering management, from costing techniques to financial analysis. Topics include industrial cost analysis and estimation, economic planning, forecasting, and budgeting, and financial analysis for engineering and engineering management.
Prerequisites: IE 582 with B or better
Recommended: Basic courses in engineering economic analysis (ENGR 390)

IE 584. SYSTEMS ENGINEERING. (4 Credits)
An overview of systems engineering within engineering management practice. Principles of systems engineering are explored through traditional and contemporary hard and soft systems of engineering techniques and practices, and through current future developments in the field.
Prerequisites: IE 582 with B- or better
Recommended: IE 581 and IE 583 and IE 586 and IE 587

IE 585. LEGAL ASPECT OF ENGINEERING MANAGEMENT. (3 Credits)
A survey of legal topics relevant to engineers, including basic of legal system, labor law, intellectual property, torts, and contracts. This is an introductory course, emphasizes on legal principles that can provide engineers with the ability to recognize legal issues that are likely to arise in the engineering profession and engineering management. Note: This is an introductory class and will in no way make a student a lawyer. Students are advised to seek legal representation if he/she encounters a legal issue.
Prerequisites: IE 582 with B or better
Recommended: IE 581 and IE 583 and (IE 586 or CCE 552)

IE 586. PROJECT RISK MANAGEMENT. (4 Credits)
An introduction to the concept of project risk in producing constructed engineering projects. Course content includes project baselining, risk definition and identification, risk assessment and management techniques, risk control, risk response, and risk management. CROSSLISTED as CCE 552/IE 586.
Equivalent to: CCE 552
IE 587. MANAGEMENT OF INFORMATION SYSTEMS. (4 Credits)
An introduction to the management of information systems and their strategic importance in business. Topics covered include global e-business and collaboration, databases and information management, basics of telecommunications and wireless technology, security vulnerabilities of information systems, basics of business intelligence and business analytics, knowledge management and enhanced decision making.
Prerequisites: IE 582 with B or better

IE 588. MANAGEMENT OF NEW PRODUCT DEVELOPMENT. (4 Credits)
Introduces the new product development (NPD) process with the objective of understanding the underlying structure in NPD and exploring the methods to manage NPD processes by applying them to case studies and term project. The NPD process is investigated through its five key phases: (1) Opportunity identification/selection, (2) Concept generation, (3) Concept/project evaluation, (4) Development, and (5) Launch.
Prerequisites: IE 581 with B or better and IE 582 [B] and IE 583 [B]
Recommended: IE 584

IE 589. PROFESSIONAL RESPONSIBILITY AND ETHICS. (3 Credits)
An in-depth exploration of professional engineering ethics. Course content includes conceptual theoretical basis of ethics, ethics among professional organizations, ethical consideration of design, critical analysis of ethical situations, ethics in the workplace, and ethical considerations regarding the broader environment. CROSSLISTED as CCE 554/IE 589.
Equivalent to: CCE 554

IE 590. STRATEGIC PLANNING IN ENGINEERING ORGANIZATIONS. (4 Credits)
Provides an overview of the strategic planning process from a variety engineering perspective. Variety engineering is explored via key management control theory concepts and through applying students' work experience.
Prerequisites: IE 581 with B or better and IE 582 [B] and IE 583 [B]

IE 591. STATISTICAL CONCEPTS FOR ENGINEERING MANAGERS. (4 Credits)
Provides a first review of basic probability and statistical inference concepts and methods relevant for engineering managers. This is followed by a presentation of frequently utilized statistical methods in industry. These include process control, regression analysis, and experimental design. For each method, the fundamental ideas will be covered, and simple examples will be presented to provide engineering managers with the background needed to interpret and manage applications of these methods in industry. The course will end with an overview of process optimization, and robust parameter design.
Prerequisites: IE 582 with B or better

IE 594. RESEARCH METHODS IN ENGINEERING. (3 Credits)
Introduction to research methodologies including surveys, interviews, quasi-experimentation, and case studies. Methods for research design, and collection and analysis of data.
Equivalent to: IE 574

IE 599. SPECIAL TOPICS. (1-5 Credits)
Recent advances in industrial engineering pertaining to the theory and application of system studies. Analysis and design of natural resource systems; evaluation; detection extraction; processing and marketing systems; advanced design of production systems with reference to social, economic, and regional planning; human engineering studies of man-machine systems; applications of operations research techniques. Nonsequence course. Not offered every term.
Equivalent to: IE 592
This course is repeatable for 99 credits.

IE 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

IE 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IE 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

IE 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

Integrative Biology (IB)

IB 501. RESEARCH. (1-16 Credits)
Graduate-level research completed under faculty supervision.
Equivalent to: Z 501
This course is repeatable for 16 credits.

IB 503. THESIS. (1-16 Credits)
Master's thesis, completed under faculty supervision.
Equivalent to: Z 503
This course is repeatable for 999 credits.

IB 505. READING AND CONFERENCE. (1-16 Credits)
For graduate students working toward a master’s degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest.
Equivalent to: Z 505
This course is repeatable for 16 credits.

IB 506. PROJECTS: OUTREACH. (1-16 Credits)
Graded P/N.
Equivalent to: BI 506
This course is repeatable for 16 credits.

IB 507. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: Z 507
This course is repeatable for 16 credits.

IB 510. INTERNSHIP. (1-16 Credits)
Equivalent to: Z 510
This course is repeatable for 16 credits.

IB 511. INTEGRATIVE BIOLOGY GRADUATE STUDENT ORIENTATION. (2 Credits)
Introduction to the graduate program in Integrative Biology and at OSU in general. Class introduces students to various skills for success in graduate school and beyond. Exploration of career options for those holding a degree in IB are explored. Graded P/N.
IB 512. INTEGRATIVE BIOLOGY GTA TRAINING AND DEVELOPMENT. (1 Credit)
Provides instructional support and professional development for first year graduate teaching assistants (GTAs) in Integrative Biology. Focuses on developing a foundation for quality instruction, facilitation, and leadership as GTAs and professionals. Best practices, skills, theory and knowledge necessary for effective teaching, facilitation, and assessment of student learning are explored.
This course is repeatable for 3 credits.

IB 513. GRANT WRITING AND ETHICS. (3 Credits)
Participants will write and submit a grant proposal by the end of the term. We discuss the main components of a typical grant proposal. Participants read and critique proposal drafts written by participants. Ethical issues are discussed as they are encountered.
Equivalent to: Z 585
This course is repeatable for 6 credits.

IB 515. SCIENCE COMMUNICATION: MAKING YOUR SCIENCE MATTER. (2 Credits)
A practical, hands-on course designed to help science graduate students build knowledge and skills for engaging with audiences beyond their scientific peers. The science of science communication, the cultures of journalism and public policy, the changing roles of scientists in society, and science advocacy will be explored through lectures, invited talks, in-class discussions and exercises.

IB 518. SCIENCE AND POLICY. (2 Credits)
An introduction to the science-policy interface in a ‘post-truth’ society. The formulation of state and federal public policy is examined, as well as the role of science and scientists in informing policy, management decisions and public understanding. Current topics are emphasized.

IB 522. COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY. (5 Credits)
Phylogenetically-based study of the form and function of vertebrate organ systems, including integumentary, musculoskeletal, cardiorespiratory, digestive, and sensory. Lab emphasizes comparative form through dissection, and function through non-invasive experimentation. Lec/lab.
Equivalent to: Z 522

IB 523. ENVIRONMENTAL PHYSIOLOGY. (3 Credits)
Comparative environmental physiology of animals with emphasis on adaptations to such aspects of the physical environment as temperature, water, ions, and gases. Consideration given to interactions between physiology and environment that influence the local and geographic distribution of animals.
Equivalent to: Z 523

IB 525. EMBRYOLOGY AND DEVELOPMENT. (5 Credits)
Equivalent to: Z 525

IB 527. PALEOBIOLOGY. (0-4 Credits)
Fossils provide a direct window into the evolution, extinction, and ecology of past life on Earth. A process-based study of the marine and terrestrial fossil record is taken to explore the topics of preservation, macroevolution, extinction of biotas, biomechanics, paleoecology, and climate change. Required laboratory and weekend field trip.
Equivalent to: BI 527

IB 531. VERTEBRATE PHYSIOLOGY I. (4 Credits)
Systems/concepts covered include motor reflexes, autonomic nervous system, digestion/metabolism, renal and osmoregulatory, endocrine and reproductive systems. First in IB 531, IB 532 series.

IB 532. VERTEBRATE PHYSIOLOGY II. (3 Credits)
Systems/concepts covered include blood, immune, lymphatic, cardiovascular, and pulmonary. Second in the IB 531, IB 532 series.
Equivalent to: Z 532

IB 537. VERTEBRATE ENDOCRINOLOGY. (4 Credits)
An exploration of vertebrate endocrinology that examines principles of hormone action, inter- and intracellular signaling mechanisms within endocrine axes, and comparative endocrine physiology, emphasizing concepts of homeostasis and methodologies for evaluating normal and physiological function. Students are provided multiple forums for class participation, in the form of scientific presentations and ‘mini-reports.’
Equivalent to: Z 537

IB 538. BEHAVIORAL NEUROBIOLOGY. (3 Credits)
Equivalent to: Z 538

IB 540. INSECT PHYSIOLOGY. (3 Credits)
Fundamentals of insect physiology from the behavioral to the molecular level. Cellular physiology and hormonal control of molting, metamorphosis and reproduction. Overview of body functions: respiration, circulation, digestion, metabolism, and osmoregulation. Physiological basis of behavior: muscles and flight, structure and functions of the nervous system, sensory physiology and chemical communication. The contributions of insect physiology to general physiological principles and biorational methods of insect pest control are discussed.
Equivalent to: Z 540

IB 545. EVOLUTION. (3 Credits)
Formal analysis of genetic and ecological mechanisms producing evolutionary change; special topics include speciation, ecological constraints, adaptive radiations, paleontology, biogeography, the origin of life, molecular evolution, and human evolution.
Equivalent to: BI 545

IB 551. FUNCTIONAL ANATOMY OF THE HUMAN MUSCULAR SYSTEM. (4 Credits)
In-depth dissection of the orientation, innervation, and functional significance of muscles and muscle groups. Topics include muscle identification, joint anatomy and variation of human form. IB 551 student expectations include vascularization and detailed joint anatomy. The laboratory component will consist of the dissection of the muscular anatomy of a human cadaver. Lab fee. Lec/lab.
Equivalent to: BI 551
Recommended: (BI 231 and 241) or (BI 331 and 341)) and ((BI 232 and 242) or (BI 332 and 342)) and ((BI 233 and 243) or (BI 333 and 343))

IB 556. PHYLOGENETICS. (4 Credits)
Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.
Equivalent to: BI 556
IB 561. MARINE AND ESTUARINE INVERTEBRATE ZOOLOGY. (4 Credits)
Comparative survey of eight major invertebrate phyla and many lesser-known phyla. Areas of emphasis will be 1) invertebrate identification, 2) natural history (diversity, habitat, feeding, behavior), and 3) comparative anatomy (adaptive significance of morphological structures). Laboratories and field trips will strongly supplement lecture material. Lec/lab. Taught at Hatfield Marine Science Center.
Equivalent to: Z 561

IB 573. HERPETOLOGY. (3 Credits)
World families and distribution of amphibians and non-avian sauropods; evolution, population biology, life histories, current literature.
Equivalent to: Z 573

IB 574. SYSTEMATIC HERPETOLOGY. (2 Credits)
A survey of the phylogenetic diversity of amphibians and reptiles of the United States. Identification through the use of keys will be stressed. Field trip fee. Lab fee. Lec/lab.
Equivalent to: Z 574

IB 577. AQUATIC ENTOmOLOGY. (4 Credits)
Biology, ecology, collection, and identification of aquatic insects. Two required Saturday field trips. Lec/lab.
Equivalent to: Z 577

IB 581. BIOGEOGRAPHY. (3 Credits)
Biogeography is the study of the distribution of biodiversity. We focus on abiotic (geological, climatological) and biotic (ecological, evolutionary) factors that govern diversity across space and through time, emphasizing assembly of communities, global change, and conservation in today's rapidly changing world. The course format includes lecture, computer-based activities, and discussion. Offered winter term in odd years.
Equivalent to: BI 581

IB 583. POPULATION BIOLOGY. (3 Credits)
Theoretical and empirical views of the structure and function of populations from across the tree of life, emphasizing the integration of ecological and evolutionary approaches. Lec.
Equivalent to: BI 583

IB 592. THEORETICAL ECOLOGY. (4 Credits)
A treatment of the central concepts of theoretical ecology, with emphasis on the analysis and modeling of single populations and multispecies communities. Topics include discrete- and continuous-time models of population growth, stochastic and deterministic processes, and the response of populations and communities to pulse and press perturbations.
Equivalent to: BI 592

IB 593. BEHAVIORAL ECOLOGY. (5 Credits)
Behavioral ecology with emphasis on both theoretical and empirical approaches. Offered alternate years.
Equivalent to: Z 593

IB 594. COMMUNITY ECOLOGY. (5 Credits)
Theory and analysis of multispecies associations. Emphasis on extent to which existing ecological theory is supported by natural phenomena. Course considers how biotic and abiotic mechanisms interact to regulate community organization and stability in marine, freshwater, and terrestrial habitats. Offered alternate years.
Equivalent to: Z 594

IB 595. DISEASE ECOLOGY. (3 Credits)
An introduction to disease ecology—the study of disease processes in natural populations and communities. The course focuses on (I) the role parasites play in the ecology and evolution of animal populations, including humans; and (II) the relevance of ecological and evolutionary considerations in managing infectious diseases.
Equivalent to: BI 595

IB 599. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary. Grading mode TBA. Taught at Hatfield Marine Science Center and Corvallis campus.
Equivalent to: Z 599
This course is repeatable for 16 credits.

IB 601. RESEARCH. (1-16 Credits)
Doctoral-level research under faculty supervision. Graded P/N.
Equivalent to: Z 601
This course is repeatable for 16 credits.

IB 603. THESIS. (1-16 Credits)
Doctoral thesis completed under faculty supervision.
Equivalent to: Z 603
This course is repeatable for 999 credits.

IB 605. READING AND CONFERENCE. (1-16 Credits)
For graduate students working toward doctoral degree. After arrangements with individual faculty, readings and discussions on topics of mutual interest.
Equivalent to: Z 605
This course is repeatable for 16 credits.

Intensive English Pgm Acad Eng (IEPA)

IEPA 002NC. FOUNDATION LISTENING/SPEAKING. (6 Credits)
Engages students in activities that familiarize them with English pronunciation and conversation models. They learn to participate in basic conversations on everyday topics using formulaic expressions and understand and give basic instructions.
This course is repeatable for 18 credits.

IEPA 003NC. ORIENTATION: SKILLS FOR LIVING IN THE U.S.. (3 Credits)
Focus on helping international students adjust to living in the United States. The emphasis is on developing skills and strategies that contribute to success in- and out of the classroom. Additional topics include personal safety, health, and American culture. Graded P/N only.

IEPA 005NC. TEST PREPARATION. (3 Credits)
Become familiar with the components and question types of standardized math (ALEKS), English language (IELTS), and graduate school examinations (varies by section). Learn test-taking strategies and focus on the language skills that are essential for success on the examinations. Graded P/N only. This course is Level 5 or above.
This course is repeatable for 9 credits.

IEPA 007NC. FOUNDATION READING/VOCABULARY. (6 Credits)
Engages students in activities that familiarize them with the English alphabet and the most common sight words building up to sentence-level understanding. Extensive practice with activities designed to help students identify and scan for details in adapted materials.
This course is repeatable for 18 credits.
IEPA 008NC. PRONUNCIATION AND ORAL FLUENCY. (3 Credits)
Improve spoken English by learning ways to pronounce words and phrases more clearly. Work on areas such as stress, linking, intonation and individual problem sounds. Get individual instructor feedback, focusing on specific target areas. Graded P/N only. This course is Level 3 or above.
This course is repeatable for 9 credits.

IEPA 009NC. FOUNDATION WRITING/GRAMMAR. (6 Credits)
Engages students in activities that familiarize them with English spelling and writing conventions. They learn to write simple sentences with basic grammar for everyday purposes.
This course is repeatable for 18 credits.

IEPA 011NC. ACADEMIC LISTENING/SPEAKING 1. (6 Credits)
Development of basic listening and speaking skills. Extensive practice with activities designed to help students listen and respond to authentic and adapted texts about everyday topics and classroom language.
Prerequisites: IEPA 002NC with C E or better or INTO Combined LS Level with a score of 1
This course is repeatable for 18 credits.

IEPA 013NC. GUIDED LEARNING. (3 Credits)
Designed to support learning taking place in Foundation and Level 1 classes. Students meet in the Learning Center and manage their learning using individualized activities which are provided by the instructor. Primary focus is on vocabulary and basic English skills. Graded P/N only.
Prerequisites: IEPA Writing Reading Level with a score of 1
This course is repeatable for 9 credits.

IEPA 014NC. ACADEMIC READING/VOCABULARY 1. (6 Credits)
Development of basic reading and vocabulary skills. Extensive practice with activities designed to help students read adapted texts about everyday topics.
Prerequisites: IEPA 007NC with C E or better or INTO Combined RW Level with a score of 1
This course is repeatable for 18 credits.

IEPA 018NC. ACADEMIC WRITING/GRAMMAR 1. (6 Credits)
Development of forms and patterns of basic English grammar used in simple sentences and paragraphs. Extensive practice with activities designed to help students understand and produce grammatical structures necessary for achievement of Level 1 learning outcomes.
Prerequisites: IEPA 009NC with C E or better or INTO Combined RW Level with a score of 1
This course is repeatable for 18 credits.

IEPA 021NC. ACADEMIC LISTENING/SPEAKING 2. (6 Credits)
Development of listening and speaking skills with a movement beyond the basic level. Extensive practice with activities designed to help students comprehend longer listening texts on a wider range of topics and improve conversational skills.
Prerequisites: IEPA 011NC with C E or better or INTO Combined LS Level with a score of 2
This course is repeatable for 18 credits.

IEPA 024NC. ACADEMIC READING/VOCABULARY 2. (6 Credits)
Development of reading and vocabulary skills with a movement beyond the basic level. Extensive practice with activities designed to help students comprehend longer texts on a wider range of topics.
Prerequisites: IEPA 014NC with C E or better or INTO Combined RW Level with a score of 2
This course is repeatable for 18 credits.

IEPA 028NC. ACADEMIC WRITING/GRAMMAR 2. (6 Credits)
Development of forms and patterns of English grammar used in paragraphs and compositions. Extensive practice with activities designed to help students understand and produce grammatical structures necessary for achievement of Level 2 learning outcomes.
Prerequisites: IEPA 018NC with C E or better or INTO Combined RW Level with a score of 2
This course is repeatable for 18 credits.

IEPA 031NC. ACADEMIC LISTENING/SPEAKING 3. (6 Credits)
Development of listening and speaking skills with a movement toward academic tasks and projects at Level 3. Extensive practice in longer and more varied listening with a focus on developing listening and note taking strategies in addition to presentational skills.
Prerequisites: IEPA 021NC with C E or better or INTO Combined LS Level with a score of 3
This course is repeatable for 18 credits.

IEPA 033NC. GUIDED LEARNING. (3 Credits)
Designed to support the learning taking place in Level 3 classes. Students meet in the Learning Center and assume greater responsibility for their learning, including setting and evaluating goals with the help of the instructor. Includes computer-assisted learning. Graded P/N only.
This course is repeatable for 9 credits.

IEPA 034NC. ACADEMIC READING/VOCABULARY 3. (6 Credits)
Development of reading and vocabulary skills with a movement toward academic tasks at Level 3. Extensive practice in longer and more varied reading with a focus on developing reading and vocabulary acquisition strategies.
Prerequisites: IEPA 024NC with C E or better or INTO Combined RW Level with a score of 3
This course is repeatable for 18 credits.

IEPA 038NC. ACADEMIC WRITING/GRAMMAR 3. (6 Credits)
Development of writing and grammar skills with a movement toward academic tasks and projects at Level 3. Extensive practice with activities designed to help students develop syntax and composition skills.
Prerequisites: IEPA 028NC with C E or better or INTO Combined RW Level with a score of 3
This course is repeatable for 18 credits.

IEPA 041NC. ACADEMIC LISTENING/SPEAKING 4. (6 Credits)
Further development of academic listening and speaking skills with a strong emphasis on critical thinking in the listening of lengthier, more complex listenings appropriate to Level 4. Extensive practice in listening and note taking to adapted lectures as well as discussions and presentations in small and large groups.
Prerequisites: IEPA 031NC with C E or better or INTO Combined LS Level with a score of 4
This course is repeatable for 18 credits.

IEPA 043NC. IDL. (3 Credits)
Individualized Directed Learning (IDL) classes meet in the Learning Center. Students assume more responsibility for their learning, including goal setting and self-monitoring with the instructor providing a framework and a contractual agreement. Designed to support learning in Level 4. Focus is on compensating for gaps in skills and on specialized needs. Graded P/N only.
This course is repeatable for 9 credits.
IEPA 044NC. ACADEMIC READING/VOCABULARY 4. (6 Credits)
Further development of reading and vocabulary skills with a strong emphasis on critical thinking in the reading of lengthier, more complex material appropriate to Level 4. Extensive practice on developing reading fluency and vocabulary acquisition strategies.
Prerequisites: IEPA 034NC with C E or better or INTO Combined RW Level with a score of 4
This course is repeatable for 18 credits.

IEPA 046NC. FUNDAMENTAL ACADEMIC EXTENSIONS. (6 Credits)
This integrated skills course reinforces skills needed to be successful in an academic setting. It provides students with the opportunity to improve academic reading comprehension, annotation and paraphrasing skills, note taking, and group participation. Students apply the strategies learned in listening and reading contexts to writing in-class assignments. Students also develop critical thinking skills through course activities.
This course is repeatable for 18 credits.

IEPA 048NC. ACADEMIC WRITING/GRAMMAR 4. (6 Credits)
Development of formal, academic writing skills including researching, analyzing and organizing the standard academic essay, using paraphrases, summaries, and quotations at Level 4. Introduction of the concept of intellectual property and referencing. Extensive practice with activities designed to help students develop more complex sentences appropriate to academic writing.
Prerequisites: IEPA 038NC with C E or better or INTO Combined RW Level with a score of 4
This course is repeatable for 18 credits.

IEPA 049NC. SPECIAL TOPICS. (3 Credits)
Topics may include English Through Photography, English Through Movies, The World of Video Games, English Through Drama, Critical Listening and Speaking, News and Views, Intermediate Vocabulary Building, English for Engineers, Academic Success, English for Business, INTO Adventure. All sections open to Level 4 and above.
This course is repeatable for 45 credits.

IEPA 050NC. ACADEMIC READING/WRITING 5. (6 Credits)
Primary focus on more sophisticated development and greater accuracy in writing essays and research papers, with accountability for sources of information at Level 5. Introduction of authentic college-level material to be read with increasingly discriminating ability, including an expanding awareness of opposing viewpoints.
Prerequisites: (IEPA 044NC with C or better and IEPA 048NC [C]) or INTO Combined RW Level with a score of 5
This course is repeatable for 18 credits.

IEPA 051NC. ACADEMIC LISTENING/SPEAKING 5. (6 Credits)
Primary focus on developing listening and speaking skills for use in an academic context at Level 5. Assignments include researched expository and persuasive class presentations. Emphasis is on developing note-taking skills using authentic lectures at normal speed and on listening to guest speakers.
Prerequisites: IEPA 041NC with C E or better or INTO Combined LS Level with a score of 5
This course is repeatable for 18 credits.

IEPA 052NC. GUIDED OBSERVATION. (6 Credits)
Designed to prepare Level 5 or 6 students for the American university classroom. With instructor guidance, students select an OSU course to observe all term, become familiar with classroom practices and develop English skills, especially listening and note-taking. Discuss, write about and compare observations and explore relevant topics in American higher education. Graded P/N only.
This course is repeatable for 18 credits.

IEPA 055NC. TOEFL PREPARATION. (3 Credits)
Develop strategies to improve scores on the iBT TOEFL exam for students at Level 5 or 6. Practice all skills, particularly integrated skills. Learn test-taking strategies and practice aspects and structures that occur frequently. Learn about the components of both iBT and paper-based tests. Become familiar with common question types. May be taken for two consecutive terms. Graded P/N only.
This course is repeatable for 9 credits.

IEPA 056NC. ACADEMIC EXTENSIONS. (6 Credits)
Integrated course that reinforces skills and strategies needed to be successful in a US university. Opportunities to improve comprehension of lectures, note-taking skills, and ability to work in groups. Additional focus on academic reading comprehension, fluency, and vocabulary study. This course is designed to be taken in place of IEPA 050 or IEPA 051.
This course is repeatable for 18 credits.

IEPA 057NC. ADVANCED GRAMMAR THROUGH WRITING. (3 Credits)
Increase the ability to recognize and use correct advanced grammar structures at Level 5 or 6. Develop increased fluency and accuracy in writing. Practice and perfect more complex grammatical structures, particularly those used frequently in university-level writing. May be taken for two consecutive terms. Graded P/N.
This course is repeatable for 9 credits.

IEPA 059NC. SPECIAL TOPICS. (3 Credits)
Topics may include Advanced Vocabulary Building, Creative Nonfiction, English Through History, Critical Thinking Through Reading and Writing, Critical Thinking Through Listening and Speaking, English for Business, All About Oregon. All sections open to Level 5 or 6.
This course is repeatable for 27 credits.

IEPA 060NC. ACADEMIC READING/WRITING 6. (6 Credits)
Development of reading and writing skills and strategies at Level 6 to prepare students for reading tasks based on academic content as encountered in university classes. Focused on skills such as analyzing, synthesizing, evaluating and critical thinking. Emphasis on skills required to produce a university-level research paper. Work focuses on writing critical reactions to readings, summarizing and paraphrasing. Evaluation and synthesis of information from a variety of sources, including library and online resources.
Prerequisites: IEPA 050NC with C E or better or INTO Combined RW Level with a score of 6
Equivalent to: IEPA 062NC
This course is repeatable for 18 credits.

IEPA 061NC. ACADEMIC LISTENING/SPEAKING 6. (6 Credits)
Focus on comprehending university-level material at Level 6. Note-taking skills are enhanced through a variety of listening activities including lectures. Students learn to analyze, synthesize, evaluate and respond to information through class discussions and oral reports. Emphasis on improving ability to demonstrate competent presentation skills for use in an undergraduate or graduate setting. Focus on incorporating outside sources from library and online research into presentations. Activities include group discussion, presentations, fluency exercises and practice developing compensatory strategies. Strong focus on self-evaluation and peer critique.
Prerequisites: IEPA 051NC with C E or better or INTO Combined LS Level with a score of 6
Equivalent to: IEPA 064NC
This course is repeatable for 18 credits.
IEPA 066NC. ADVANCED ACADEMIC EXTENSIONS. (6 Credits)
Integrated course that reinforces and expands skills and strategies need to be successful in a US university. Opportunities to improve comprehension of lectures, note-taking skills, and ability to work in groups. Additional focus on critical thinking, academic reading comprehension, academic writing fluency, and vocabulary study. This course is designed to be taken in place of IEPA 060 or IEPA 061. This course is repeatable for 18 credits.

IEPA 099NC. COMMUNICATION FOR IGTAs. (3 Credits)
Enhance communication with American university students by practicing the skills IGTAs need to deliver materials in their fields: pronunciation, presentation skills and intercultural communication. Make presentations applying the language and communication skills learned in class. An independent panel of students and faculty evaluate the final presentations. This course is repeatable for 6 credits.

**Intensive English Pgm Gen Engl (IEPG)**

IEPG 001NC. PRONUNCIATION. (3 Credits)
Focuses on developing pronunciation skills for GE students of all levels. Activities include audio journals, presentations, and conversations. Students practice vowel sounds, word and sentence stress, and intonation to improve clarity and fluency of speech. Graded P/N. This course is repeatable for 99 credits.

IEPG 003NC. TOURISM FOR EVERYONE. (3 Credits)
Focuses on vocabulary and commonly spoken English for Special Programs’ short-term groups. Graded P/N. This course is repeatable for 99 credits.

IEPG 005NC. AMERICAN IDIOMS. (6 Credits)
Develops vocabulary emphasizing common and popular colloquial, slang, and idiomatic expressions in English. Students practice their skills with idioms in live conversations, classroom listening and speaking activities, and interviews with native speakers. Other emphases include pronunciation, intonation, and appropriate use of idiomatic vocabulary. Graded P/N. This course is repeatable for 99 credits.

IEPG 006NC. FOUNDATION PREP READING. (6 Credits)
Engages students in activities that familiarize them with the English alphabet and spelling conventions, and the most common sight words building up to sentence-level understanding. They learn to identify and scan for details in adapted materials from written sources including calendars, timetables, signs, leaflets, brochures and advertisements. Prepares students for the language use at the A1 level of the Common European Framework of Reference (CEFR). This course is repeatable for 99 credits.

IEPG 007NC. FOUNDATION PREP VOCABULARY. (6 Credits)
Engages students in activities that familiarize them with the English alphabet and survival vocabulary. They learn to recognize and use survival vocabulary and communicate personal information and basic needs. Prepares students for the language use at the A1 level of the Common European Framework of Reference (CEFR). This course is repeatable for 99 credits.

IEPG 008NC. EXPLORING THE WORLD. (6 Credits)
Focuses on vocabulary acquisition and reading comprehension skills. Students explore a variety of topics related to geography, culture, travel, technology, and the environment. Activities include presentations on global topics, reading activities, and vocabulary activities. Graded P/N. This course is repeatable for 99 credits.

IEPG 009NC. FOUNDATION PREP LISTENING/SPEAKING. (6 Credits)
Engages students in activities that familiarize them with English pronunciation and conversation models. They learn to participate in basic conversations on survival topics using formulaic expressions and understand and give basic instructions. Prepares students for the language use at the A1 level of the Common European Framework of Reference (CEFR). This course is repeatable for 99 credits.

IEPG 010NC. READING/Writing 1. (6 Credits)
Development of basic reading and writing skills. Using topics from everyday life, focus is on vocabulary, spelling, sentence and paragraph writing and reading of short passages. Prerequisites: (INTO Combined RW Level with a score of 1 or IEPH 010NC with C or better or (IEPG 006NC with C or better and IEPG 006NC [C]) and (IEPG 011NC (may be taken concurrently) [C]) or (IEPG 021NC (may be taken concurrently) [C] and IEPG 017NC (may be taken concurrently) [C]). This course is repeatable for 99 credits.

IEPG 011NC. LISTENING/SPEAKING 1. (9 Credits)
Designed to provide the language and cultural tools for survival in an English-speaking environment. Primary focus is on basic English words, phrases and sentences and the ability to use them appropriately in practical, everyday contexts through short conversations and oral reports. Prerequisites: (INTO Combined LS Level with a score of 1 or IEPH 011NC with C or better or (IEPG 009NC with C or better and IEPH 009NC [C])) and (IEPG 010NC (may be taken concurrently) [C] or (IEPG 020NC (may be taken concurrently) [C] and IEPG 017NC (may be taken concurrently) [C]) or IEPG 027NC (may be taken concurrently) [C]). This course is repeatable for 99 credits.

IEPG 013NC. MEDIA LAB. (3 Credits)
Designed to develop individual, independent learning and language acquisition strategies, including goal setting and self-monitoring. Guided by instructors, students make use of digital, print, and audio media to improve specific language skills, such as listening, vocabulary, pronunciation, speaking, etc. Focus is on compensating for gaps in skills and on specializing needs. Classes meet in the Learning Center. Graded P/N. This course is repeatable for 99 credits.

IEPG 017NC. PRACTICAL GRAMMAR 1. (6 Credits)
Study of forms and patterns of basic English grammar used in everyday conversations and simple sentences. Primary focus is on students being able to understand and produce grammatical structures necessary for achievement of Level 1 learning outcomes. Prerequisites: (IEPG 010NC (may be taken concurrently) with C or better or IEPG 020NC (may be taken concurrently) with C or better) and (IEPG 011NC (may be taken concurrently) [C] or IEPG 021NC (may be taken concurrently) [C]). This course is repeatable for 99 credits.
**IEPG 020NC. READING/Writing 2. (6 Credits)**

Development of reading and writing skills beyond basic level. Reading focus is on comprehending longer texts on a wider range of topics. Writing focus continues sentence and paragraph work and introduces basic composition skills.

**Prerequisites:** (IEPG 010NC with C or better and IEPH 010NC [C]) or IEPG 020NC [C] or INTO Combined RW Level with a score of 2

This course is repeatable for 99 credits.

**IEPG 021NC. LISTENING/SPEAKING 2. (9 Credits)**

Development of listening and speaking skills beyond the basic level. Primary focus is to practice and expand listening and conversational skills. Students participate in discussions, conduct interviews and make short oral reports using everyday English vocabulary.

**Prerequisites:** (IEPG 011NC with C or better and IEPH 011NC [C]) or IEPG 021NC [C] or INTO Combined LS Level with a score of 2

This course is repeatable for 99 credits.

**IEPG 026NC. AE PREPARATION. (6 Credits)**

Preparation for study in the Academic English Program. Read and listen to content on topics common in university classrooms. Gain vocabulary knowledge and develop skills such as note-taking and outlining. Explore the campus firsthand to learn about the American university system.

Graded P/N.

This course is repeatable for 99 credits.

**IEPG 027NC. PRACTICAL GRAMMAR 2. (6 Credits)**

Review and practice of Level 1 grammar and development and use of the basic forms and patterns of Level 2 grammar. Primary focus is on speaking, listening, and writing activities using the targeted structures.

**Prerequisites:** (IEPG 017NC with C or better and IEPH 017NC [C]) or IEPG 027NC [C]

This course is repeatable for 99 credits.

**IEPG 029NC. SPECIAL TOPICS. (3,6 Credits)**

ST/ENGLISH THROUGH ANIMATION (6): Develops the ability to understand authentic spoken English. By watching animated popular TV segments, students will learn to understand English as it is really spoken. In addition to developing listening skills, students develop their speaking ability, expand their vocabulary base, and deepen their understanding of culture in the U.S. and in the countries of classmates. Conversation and speaking will be emphasized through the use of dialogue. Graded P/N.

ST/ENGLISH THROUGH MUSIC (6): Course focus is on strengthening listening and idiomatic vocabulary skills through music in English. Goals of vocabulary activities with song lyrics include increasing students’ knowledge of idiomatic, slang, and cultural expressions, as well as how more common, familiar words are used in expressive, poetic, and unique ways. English through Music will significantly enhance and strengthen students’ listening skills through a variety of activities. Graded P/N.

ST/ENGLISH FOR TOURISM (6): Learn vocabulary and commonly spoken English for working in the tourism industry and for traveling. Prepare to manage a restaurant, work for an airline, give tours or share the history and culture of your country with others. Graded P/N.

ST/ENGLISH FOR PROFESSIONAL SUCCESS (6): Students learn the conventions of business and professional demonstrations. Focus is on specialized vocabulary for communicating professional information clearly and fluently. Students practice creating job resumes and cover letters, as well as hold mock interviews and business conferences. Graded P/N.

ST/GLORIOUS FOOD (3): Course focuses on the vocabulary of cooking and food preparation. Primary emphasis is on cross-cultural communication. Students share culinary traditions from their home countries and learn about American food culture. Students present on traditional foods and diets. Class discussions also involve conversations about nutrition, healthy, and unhealthy eating. Graded P/N.

ST/PRESENT YOURSELF (6): Focuses on learning the necessary skills in giving effective presentations on a range of topics in a variety of situations. Graded P/N.

ST/AMERICAN UNIVERSITY CULTURE (6): Focuses on helping students adapt to university culture. Students learn and practice everyday language used on a college campus, explore cultural differences in communication, and learn about services and programs available on and near campus. Graded P/N.

ST/SPELLING (3): Focuses on fundamental rules for correct spelling. Students learn and practice rules to help them improve spelling, learn spelling rules about consonant and vowel sounds, and understand links between pronunciation and spelling. In addition, students practice computer skills to improve writing. Graded P/N.

This course is repeatable for 99 credits.

**IEPG 030NC. READING/Writing 3. (6 Credits)**

Engages students in a variety of text and compositions. They summarize the main points in adapted fiction from non-fiction from popular sources, skim for main ideas, and scan for specific details in factual texts. They acquire the basics of paragraph writing. They summarize factual information and describe personal experiences will enough to make another person understand the main points. Prepares students for language use at the B1 level of the Common European Framework of Reference (CEFR).

**Prerequisites:** (IEPG 020NC with C or better and IEPH 020NC [C]) or IEPH 030NC [C] or INTO Combined RW Level with a score of 3

This course is repeatable for 99 credits.
IEPG 031NC. LISTENING/SPEAKING 3. (9 Credits)
Engages students in communication about practical topics and problems. They listen to recordings of adapted material to understand the main points. They learn to give personal opinions in informal conversations, solve practical problems find out information, and ask for and follow detailed directions. They give short prepared presentations on personal experiences or other very familiar topics. Prepares students for language use at the B1 level of the Common European Framework of Reference (CEFR).

Prerequisites: (IEPG 021NC with C or better and IEPH 021NC [C]) or IEPH 031NC [C] or INTO Combined LS Level with a score of 3
This course is repeatable for 99 credits.

IEPG 033NC. ENGLISH THROUGH LITERATURE. (6 Credits)
Course focus is on strengthening reading comprehension and vocabulary skills through reading adapted English novels and novellas, while introducing students to English history and culture through literature. Activities include summary presentation, active reading strategies, and extensive class discussion about literary themes, concepts, and the relationships between those themes and current events. Graded P/N.
This course is repeatable for 99 credits.

IEPG 035NC. VOCABULARY BUILDING. (6 Credits)
Develop and increase vocabulary used in classroom and social contexts. Students receive multiple exposures to target words from leveled word lists through self-assessment, reflection, word study strategies, reading, discussions, writing, and games. Graded P/N.
This course is repeatable for 99 credits.

IEPG 037NC. PRACTICAL GRAMMAR 3. (6 Credits)
Focus on more tenses and aspects of English grammar. Students begin combining tenses learned in Level 2 with those studied in Level 3 to develop increasingly complex sentences for use and practice in conversations, sentences and short compositions. Graded P/N.

Prerequisites: (IEPG 027NC with C or better and IEPH 027NC [C]) or IEPH 037NC [C]
This course is repeatable for 99 credits.

IEPG 039NC. SPECIAL TOPICS. (6 Credits)
ST/ENGLISH THROUGH MOVIES (6): Designed to explore culture and English language through the careful viewing of major motion pictures. Using theme-related background material and vocabulary, students enhance their appreciation of movies from various genres. Comprehension tasks aid in deepening understanding of characters, plot actions, and themes. Classroom activities also include opportunities for small group and class discussion. ST/FANFICTION (6): Explore an important movie or short novel/short story. Develop comprehension skills, vocabulary and grammar structures while learning about the culture of the story. Then use the story as a base to write original fiction by practicing writing structures and literary elements important in creative writing. Graded P/N.
This course is repeatable for 99 credits.

IEPG 040NC. READING/Writing 4. (6 Credits)
Engages students in activities that help them communicate in various social and cultural contexts. They scan authentic and adapted materials to identify information of practical use and identify the purpose, point of view, tone and conclusions in informative and persuasive texts. They learn to write coherent and cohesive paragraphs and longer texts with reasonable accuracy.

Prerequisites: (IEPG 030NC with C or better and IEPH 030NC [C]) or IEPH 040NC [C] or INTO Combined RW Level with a score of 4
This course is repeatable for 99 credits.

IEPG 041NC. LISTENING/SPEAKING 4. (9 Credits)
Engages students in the use of informal spoken English. They listen to adapted and authentic recordings to understand main ideas and details. They learn to express themselves on a variety of subjects in everyday conversations. They learn to give instructions, explain problems, and make complaints. They give prepared presentations on cultural topics. Prepares students for language use at the B1+ level of the Common European Framework of Reference (CEFR).

Prerequisites: (IEPG 031NC with C or better and IEPH 031NC [C]) or IEPH 041NC [C] or INTO Combined LS Level with a score of 4
This course is repeatable for 99 credits.
IEPG 049NC. SPECIAL TOPICS. (6 Credits)
ST/ALL ABOUT OREGON (6): Introduces students to the diversity of Oregon culture, geography, geology, history and folklore. The course is both content based, teaching general information about Oregon, and language focused, with an emphasis on content-related vocabulary, listening strategies and reading skills. Students are encouraged to actively participate in learning by taking a field trip to a relevant site of interest. ST/ENGLISH THROUGH POPULAR SCIENCE CULTURE (6): Designed to develop skills in reading, writing, listening, and speaking through current scientific discoveries and innovations. Insights learned from recent advances in science will provide practical knowledge for the workplace environment and relevant relational dynamics. Graded P/N. ST/AMERICAN STUDIES (6): Introduces students to the culture and history of America through diverse readings, videos, audio recordings, and first-hand experiences. Skill emphases include vocabulary acquisition and reading comprehension. Students create presentations to share what they learn about American traditions and customs. Class discussions explore the culture and history of the United States and its international relations with students' home countries. Graded P/N. ST/OUTDOOR PURSUITS (6): Designed to develop skills in reading, writing, listening, and speaking through interaction with common outdoor activities. Learn about how to live a healthy and environmentally aware lifestyle from insights from local experts in the university and local community. Graded P/N. ST/STRATEGIES FOR INTERPERSONAL COMMUNICATION (6): Develops the necessary skills for effective communication in small groups. This course will help students learn helpful language for collaborating with a team, provides strategies for navigating complicated discussions, and builds confidence in communication in English. Graded P/N. ST/CROSS-CULTURAL COMMUNICATION (6): Explore what culture is, what influences it, and how it affects the way people understand the world and communicate with others. Students learn about American culture, behaviors, norms, and values, and those of their classmates by comparing them to each other through a variety of interactive activities. Students have the opportunity to share a classroom with American university students. Graded P/N. ST/IT'S NEWS TO ME (6): Course focuses on reading and vocabulary comprehension skills and conversation skills through the use of adapted and authentic news media sources, including print newspapers, news radio, and news video. Students become familiar with the conventions of journalistic writing and learn about the structure of English language newspapers. Activities include reading comprehension tasks, analysis of news stories, presentations, and creating a class newspaper. ST/BUSINESS VOCABULARY BUILDING (6): Course focuses on improving the use of business English vocabulary and idioms. Students learn and apply a variety of authentic words from the text, in-class activities, and assigned practice to help them communicate more effectively in a business context. The course focuses on both acquisition of targeted vocabulary and strategies for decoding and retention. Graded P/N. ST/ENGLISH THROUGH PHOTOGRAPHY (6): Focuses on improving English language skills through reading, listening and speaking about photography and by actually taking and showing photographs. Students will spend time outside of class to take pictures and then talk about the pictures in class. Presentations will be given about one's own photographs. Graded P/N. ST/ENGLISH THROUGH VOLUNTEERING (6): English and critical thinking skills are developed by exploring social and environmental issues in class and then by putting that knowledge into action by volunteering for community organizations. In the classroom, English skills are developed through discussions, reading, writing, and listening to people talk about the issues. The students will then go out into the community with the class to do meaningful volunteer activities, such as helping to build a house and grow vegetables for needy families (Session 1) or sharing one's culture and talents with children and seniors (Session 2). Graded P/N.

IEPG 051NC. LISTENING/SPEAKING 5. (9 Credits)
Engages students in the use of standard spoken English. They listen to authentic radio, TV, podcasts, Internet and other media to understand main ideas and details. They learn to express themselves more naturally in conversation. They evaluate problems, lead class discussions, and give informal or formal presentations on contemporary topics. American culture is included in materials and activities. Prepares students for language use at the B2 level of the Common European Framework of Reference (CEFR).
Prerequisites: (IEPG 041NC with C or better and IEPH 041NC [C]) or IEPH 051NC [C] or INTO Combined LS Level with a score of 5
This course is repeatable for 99 credits.

Intensive English Pgm Gen Engl (IEPH)

IEPH 001NC. PRONUNCIATION. (3 Credits)
Focuses on developing pronunciation skills for GE students of all levels. Activities include audio journals, presentations, and conversations. Students practice vowel sounds, word and sentence stress, and intonation to improve clarity and fluency of speech. Graded P/N. This course is repeatable for 99 credits.

IEPH 002NC. CAMPUS CONNECTIONS. (1 Credit)
Focuses on helping students adjust to living in the United States. The emphasis is on American customs, culture shock and common slang used in everyday interactions. Graded P/N. This course is repeatable for 99 credits.

IEPH 003NC. TOURISM FOR EVERYONE. (3 Credits)
Focuses on vocabulary and commonly spoken English for working in the tourism industry and for traveling. Prepare to manage a restaurant, work for an airline, give tours or share the history and culture of your country with others. Graded P/N. This course is repeatable for 99 credits.

IEPH 004NC. AMERICAN HOLIDAYS. (6 Credits)
Teaches the culture and history of American holidays and traditional holiday celebrations. Class activities involve planning and hosting holiday parties, reading histories and accounts of holiday celebrations in America, and acquiring the vocabulary used for discussing holidays and traditions. Graded P/N. This course is repeatable for 99 credits.

IEPH 005NC. AMERICAN IDIOMS. (6 Credits)
Develops vocabulary emphasizing common and popular colloquial, slang, and idiomatic expressions in English. Students practice their skills with idioms in live conversations, classroom listening and speaking activities, and interviews with native speakers. Other emphases include pronunciation, intonation, and appropriate use of idiomatic vocabulary. Graded P/N. This course is repeatable for 99 credits.

IEPH 006NC. FOUNDATION PREP READING. (6 Credits)
Engages students in activities that familiarize them with the English alphabet and spelling conventions, and the most common sight words building up to sentence-level understanding. They learn to identify and scan for details in adapted materials from written sources including calendars, timetables, schedules, signs, leaflets, brochures, and advertisements. Prepares students for the language use at the A1 level of the Common European Framework of Reference (CEFR). This course is repeatable for 99 credits.
IEPH 007NC. FOUNDATION PREP VOCABULARY. (6 Credits)
Engages students in activities that familiarize them with the English alphabet and survival vocabulary. They learn to recognize and use survival vocabulary to communicate personal information and basic needs. Prepares students for the language use at the A1 level of the Common European Framework of Reference (CEFR).
This course is repeatable for 99 credits.

IEPH 008NC. EXPLORING THE WORLD. (6 Credits)
Focuses on vocabulary acquisition and reading comprehension skills. Students explore a variety of topics related to geography, culture, travel, technology, and the environment. Activities include presentations on global topics, reading activities, and vocabulary activities. Graded P/N.
This course is repeatable for 99 credits.

IEPH 009NC. FOUNDATION PREP LISTENING/SPEAKING. (6 Credits)
Engages students in activities that familiarize them with English pronunciation and conversation models. They learn to participate in basic conversations on survival topics using formulaic expressions and understand and give basic instructions. Prepares students for the language use at the A1 level of the Common European Framework of Reference (CEFR).
This course is repeatable for 99 credits.

IEPH 010NC. READING/Writing 1. (6 Credits)
Development of basic reading and writing skills. Using topics from everyday life, focus is on vocabulary, spelling, sentence and paragraph writing and reading of short passages.
Prerequisites: INTO Combined RW Level with a score of 1 or IEPG 010NC (may be taken concurrently) with C or better or (IEPG 006NC (may be taken concurrently) with C or better and IEPH 006NC [C]) and (IEPH 011NC (may be taken concurrently) [C] or (IEPH 017NC (may be taken concurrently) [C] and IEPH 021NC (may be taken concurrently) [C]))
This course is repeatable for 99 credits.

IEPH 011NC. LISTENING/SPEAKING I. (9 Credits)
Designed to provide the language and cultural tools for survival in an English speaking environment. Primary focus is on basic English words, phrases and sentences and the ability to use them appropriately in practical, everyday contexts through short conversations and oral reports.
Prerequisites: INTO Combined LS Level with a score of 1 or IEPG 011NC (may be taken concurrently) with C or better and IEPH 009NC [C]) and (IEPH 010NC (may be taken concurrently) [C] or IEPH 020NC (may be taken concurrently) [C]) and (IEPG 017NC (may be taken concurrently) [C] or IEPH 027NC (may be taken concurrently) [C])
This course is repeatable for 99 credits.

IEPH 013NC. MEDIA LAB. (3 Credits)
Designed to develop individual, independent learning and language acquisition strategies, including goal setting and self-monitoring. Guided by instructors, students make use of digital, print, and audio media to improve specific language skills, such as listening, vocabulary, pronunciation, speaking, etc. Focus is on compensating for gaps in skills and on specializing needs. Classes meet in the Learning Center. Graded P/N.
This course is repeatable for 99 credits.

IEPH 017NC. PRACTICAL GRAMMAR I. (6 Credits)
Study of forms and patterns of basic English grammar used in everyday conversations and simple sentences. Primary focus is on students being able to understand and produce grammatical structures necessary for achievement of Level 1 learning outcomes.
Prerequisites: (IEPH 010NC (may be taken concurrently) with C or better or IEPH 020NC (may be taken concurrently) with C or better) and (IEPH 011NC (may be taken concurrently) [C] or IEPH 021NC (may be taken concurrently) [C])
This course is repeatable for 99 credits.

IEPH 020NC. READING/Writing 2. (6 Credits)
Development of reading and writing skills beyond basic level. Reading focus is on comprehending longer texts on a wider range of topics. Writing focus continues sentence and paragraph work and introduces basic composition skills.
Prerequisites: (IEPG 010NC (may be taken concurrently) with C or better and IEPH 010NC [C]) or IEPG 020NC (may be taken concurrently) [C] or INTO Combined RW Level with a score of 2
This course is repeatable for 99 credits.

IEPH 021NC. LISTENING/SPEAKING 2. (9 Credits)
Development of listening and speaking skills beyond the basic level. Primary focus is to practice and expand listening and conversational skills. Students participate in discussions, conduct interviews and make short oral reports using everyday English vocabulary.
Prerequisites: (IEPG 011NC (may be taken concurrently) with C or better and IEPH 011NC [C] or IEPG 021NC (may be taken concurrently) [C]) or INTO Combined LS Level with a score of 2
This course is repeatable for 99 credits.

IEPH 026NC. AE PREPARATION. (6 Credits)
Preparation for study in the Academic English Program. Read and listen to content on topics common in university classrooms. Gain vocabulary knowledge and develop skills such as note-taking and outlining. Explore the campus firsthand to learn about the American university system. Graded P/N.
This course is repeatable for 99 credits.

IEPH 027NC. PRACTICAL GRAMMAR 2. (6 Credits)
Review and practice of Level 1 grammar and development and use of the basic forms and patterns of Level 2 grammar. Primary focus is on speaking, listening, and writing activities using the targeted structures.
Prerequisites: (IEPG 017NC (may be taken concurrently) with C or better and IEPH 017NC [C]) or IEPG 027NC (may be taken concurrently) [C]
IEPH 029NC. SPECIAL TOPICS. (3,6 Credits)
ST/ENGLISH THROUGH ANIMATION (6): Develops the ability to understand authentic spoken English. By watching animated popular TV segments, students will learn to understand English as it is really spoken. In addition to developing listening skills, students will develop their speaking ability, expand their vocabulary base, and deepen their understanding of culture in the U.S. and in the countries of classmates. Conversation and speaking will be emphasized through the use of dialogue. Graded P/N. ST/ENGLISH THROUGH MUSIC (6): Course focus is on strengthening listening and idiomatic vocabulary skills through music in English. Goals of vocabulary activities with song lyrics include increasing students' knowledge of idiomatic, slang, and cultural expressions, as well as how more common, familiar words are used in expressive, poetic, and unique ways. English Through Music will significantly enhance and strengthen students' listening skills through a variety of activities. Graded P/N. ST/ENGLISH FOR TOURISM (6): Learn vocabulary and common spoken English for working in the tourism industry and traveling. Prepare to manage a restaurant, work for an airline, give tours or share the history and culture of your country with others. Graded P/N. ST/ENGLISH FOR PROFESSIONAL SUCCESS (6): Students learn the conventions of business and professional demonstrations. Focus is on specialized vocabulary for communicating professional information clearly and fluently. Students practice creating job resumes and cover letters, as well as hold mock interviews and business conferences. Graded P/N. ST/GLORIOUS FOOD (3): Course focuses on the vocabulary of cooking and food preparation. Primary emphasis is on cross-cultural communication. Students share culinary traditions from their home countries and learn about American food culture. Students present on traditional foods and diets. Class discussions also involve conversations about nutrition, healthy, and unhealthy eating. Graded P/N. ST/PRESENT YOURSELF (6): Focuses on learning the necessary skills for giving effective presentations on a range of topics in a variety of situations. Graded P/N.
This course is repeatable for 99 credits.

IEPH 030NC. READING/WRITING 3. (6 Credits)
Engages students in a variety of texts and compositions. They summarize the main points in adapted fiction or non-fiction from popular sources, skim for main ideas, and scan for specific details in factual texts. They acquire the basics of paragraph writing. They learn to identify information of practical use and identify the purpose, point and emphasize. Engages students in activities that help them communicate in various social and cultural contexts. They scan authentic and adapted materials related to professional success. Students will significantly enhance and strengthen students' listening skills through a variety of activities. Graded P/N. ST/ENGLISH THROUGH ANIMATION (6): Develops the ability to understand authentic spoken English. By watching animated popular TV segments, students will learn to understand English as it is really spoken. In addition to developing listening skills, students will develop their speaking ability, expand their vocabulary base, and deepen their understanding of culture in the U.S. and in the countries of classmates. Conversation and speaking will be emphasized through the use of dialogue. Graded P/N. ST/ENGLISH THROUGH MUSIC (6): Course focus is on strengthening listening and idiomatic vocabulary skills through music in English. Goals of vocabulary activities with song lyrics include increasing students' knowledge of idiomatic, slang, and cultural expressions, as well as how more common, familiar words are used in expressive, poetic, and unique ways. English Through Music will significantly enhance and strengthen students' listening skills through a variety of activities. Graded P/N. ST/ENGLISH FOR TOURISM (6): Learn vocabulary and common spoken English for working in the tourism industry and traveling. Prepare to manage a restaurant, work for an airline, give tours or share the history and culture of your country with others. Graded P/N. ST/ENGLISH FOR PROFESSIONAL SUCCESS (6): Students learn the conventions of business and professional demonstrations. Focus is on specialized vocabulary for communicating professional information clearly and fluently. Students practice creating job resumes and cover letters, as well as hold mock interviews and business conferences. Graded P/N. ST/GLORIOUS FOOD (3): Course focuses on the vocabulary of cooking and food preparation. Primary emphasis is on cross-cultural communication. Students share culinary traditions from their home countries and learn about American food culture. Students present on traditional foods and diets. Class discussions also involve conversations about nutrition, healthy, and unhealthy eating. Graded P/N. ST/PRESENT YOURSELF (6): Focuses on learning the necessary skills for giving effective presentations on a range of topics in a variety of situations. Graded P/N.
This course is repeatable for 99 credits.

IEPH 031NC. LISTENING/SPEAKING 3. (9 Credits)
Engages students in communication about practical topics and problems. They listen to recordings of adapted material to understand the main points. They learn to give personal opinions in informal conversations, solve practical problems, find out information, and ask for and follow detailed directions. They give short prepared presentations on personal experiences or other very familiar topics. Prepares students for language use at the B1 level of the Common European Framework of Reference (CEFR).
Prerequisites: (IEPG 020NC (may be taken concurrently) with C or better and IEPH 020NC [C] or IEPG 030NC [C] or INTO Combined SW Level with a score of 3
This course is repeatable for 99 credits.

IEPH 032NC. LISTENING/SPEAKING 4. (9 Credits)
Engages students in communication about practical topics and problems. They listen to recordings of adapted material to understand the main points. They learn to give personal opinions in informal conversations, solve practical problems, find out information, and ask for and follow detailed directions. They give short prepared presentations on personal experiences or other very familiar topics. Prepares students for language use at the B1 level of the Common European Framework of Reference (CEFR).
Prerequisites: (IEPG 021NC (may be taken concurrently) with C or better and IEPH 021NC [C] or IEPG 031NC (may be taken concurrently) [C] or INTO Combined LS Level with a score of 3
This course is repeatable for 99 credits.

IEPH 033NC. ENGLISH THROUGH LITERATURE. (6 Credits)
Course focus is on strengthening reading comprehension and vocabulary skills through reading adapted English novels and novellas, while introducing students to English history and culture through literature. Activities include summary presentation, active reading strategies, and extensive class discussion about literary themes, concepts, and the relationships between those themes and current events. Graded P/N. This course is repeatable for 99 credits.

IEPH 035NC. VOCABULARY BUILDING. (6 Credits)
Develop and increase vocabulary used in classroom and social contexts. Students receive multiple exposures to target words from leveled word lists through self-assessment, reflection, word study strategies, reading, discussions, writing, and games. Graded P/N. This course is repeatable for 99 credits.

IEPH 037NC. PRACTICAL GRAMMAR 3. (6 Credits)
Focus on more tenses and aspects of English grammar. Students begin combining tenses learned in Level 2 with those studied in Level 3 to develop increasingly complex sentences for use and practice in conversations, sentences and short compositions.
Prerequisites: (IEPG 027NC (may be taken concurrently) with C or better and IEPH 027NC [C] or IEPG 037NC (may be taken concurrently) [C]
This course is repeatable for 99 credits.

IEPH 039NC. SPECIAL TOPICS. (6 Credits)
ENGLISH THROUGH MOVIES (6): Designed to explore culture and English language through the careful viewing of major motion pictures. Using theme-related background material and vocabulary, students enhance their appreciation of movies from various genres. Comprehension tasks aid in deepening understanding of characters, plot actions, and themes. Classroom activities also include opportunities for small group and class discussion.
ST/FANFICTION (6): Develop comprehension skills, vocabulary and grammar structures while learning about the culture of the story. Then use the story as a base to write original fiction by practicing writing structures and literary elements important in creative writing. Graded P/N.
This course is repeatable for 99 credits.

IEPH 040NC. READING/WRITING 4. (6 Credits)
Engages students in activities that help them communicate in various social and cultural contexts. They scan authentic and adapted materials to identify information of practical use and identify the purpose, point of view, tone and conclusions in informative and persuasive texts. They learn to write coherent and cohesive paragraphs and longer texts with reasonable accuracy. Prepares students for language use at the B1+ level of the Common European Framework Reference (CEFR).
Prerequisites: (IEPG 030NC (may be taken concurrently) with C or better and IEPH 030NC [C] or IEPG 040NC (may be taken concurrently) or INTO Combined RW Level with a score of 4
This course is repeatable for 99 credits.

IEPH 041NC. LISTENING/SPEAKING 4. (9 Credits)
Engages students in the use of informal spoken English. They listen to adapted and authentic recordings to understand main ideas and details. They learn to express themselves on a variety of subjects in everyday conversations. They learn to give instructions, explain problems, and make complaints. They give prepared presentations on cultural topics. Prepares students for language use at the B1+ level of the Common European Framework of Reference (CEFR).
Prerequisites: (IEPG 031NC (may be taken concurrently) with C or better and IEPH 031NC [C] or IEPG 041NC (may be taken concurrently) [C] or INTO Combined LS Level with a score of 4
This course is repeatable for 99 credits.
IEPH 043NC. BUSINESS MATTERS. (6 Credits)
Development of language skills for business settings and for fulfilling career goals, including preparing for the job market, working in sales, and advertising. Graded P/N. This course is repeatable for 99 credits.

IEPH 047NC. PRACTICAL GRAMMAR 4. (3 Credits)
Focus on developing increased fluency and grammatical accuracy as appropriate to high-intermediate or advanced English proficiency. Practice applying correct grammar in both written and oral communication. Graded P/N. This course is repeatable for 99 credits.

IEPH 049NC. SPECIAL TOPICS. (6 Credits)
ST/MOVIE MAKING (6): Improves English skills and builds self-confidence by focusing on movie-making projects. Students will receive an introduction to recording and editing digital video. The course develops vocabulary, verbal and non-verbal communication skills, reading and listening comprehension, and presentation skills. Students form teams to produce short videos on subjects of choice. Graded P/N. ST/AMERICAN STUDIES (6): Introduces students to the culture and history of America through diverse readings, videos, audio recordings, and first-hand experiences. Skill emphases include vocabulary acquisition and reading comprehension. Students create presentations to share what they learn about American traditions and customs. Class discussions explore the culture and history of the United States and its international relations with students' home countries. Graded P/N. ST/TECHNOLOGY TOOLS (6): Designed to explore social networking sites such as blogs, delicious.com, plurk.com, and ning.com. Skills gained such as linking, posting, uploading, etc. will be transferable to many technology situations. Engaging activities are designed to foster language learning in the online environment. Graded P/N. ST/CROSS-CULTURAL COMMUNICATION (6): Explore what culture is, what influences it, and how it affects the way people understand the world and communicate with others. Students learn about American culture, behaviors, norms, and values, and those of their classmates by comparing them to each other through a variety of interactive activities. Students have the opportunity to share a classroom with American university students. Graded P/N. ST/IT'S NEWS TO ME (6): Course focuses on reading and vocabulary comprehension skills, and conversation skills through the use of adapted and authentic media sources, including print newspapers, news radio, and news video. Students become familiar with the conventions of journalistic writing and learn about the structure of English language newspapers. Activities include reading, comprehension tasks, analysis of news stories, presentations, and creating a class newspaper. Graded P/N. ST/BUSINESS VOCABULARY BUILDING (6): Course focuses on improving the use of business English vocabulary and idioms. Students learn and apply a variety of authentic words from the text, in-class activities, and assigned practice to help them communicate more effectively in a business context. The course focuses on both acquisition of targeted vocabulary and strategies for decoding and retention. Graded P/N.

IEPH 050NC. READING/WRITING 5. (6 Credits)
Engages students in activities and projects that help them read and write fluently and accurately in a variety of genres. They read authentic texts to grasp main ideas and their significance. They learn to recognize specific viewpoints in reports and reviews and to evaluate information and arguments from several sources. They learn to write well-organized text in multiple genres. Prepares students for language use at the B2 level of the Common European Framework of Reference (CEFR). Prerequisites: (IEPH 040NC may be taken concurrently) with C or better and IEPH 040NC [C] or IEPG 050NC (may be taken concurrently) [C] or INTO Combined RW Level with a score of 5 This course is repeatable for 99 credits.

IEPH 051NC. LISTENING/SPEAKING 5. (9 Credits)
Engages students in the use of standard spoken English. They listen to authentic radio, TV, podcasts, Internet and other media to understand main ideas and details. They learn to express themselves more naturally in conversation. They evaluate problems, lead class discussions, and give informal or formal presentations on contemporary topics. American culture is included in materials and activities. Prepares students for language use at the B2 level of the Common European Framework of Reference (CEFR). Prerequisites: (IEPG 041NC (may be taken concurrently) with C or better and IEPH 041NC [C] or IEPG 051NC (may be taken concurrently) [C] or INTO Combined LS Level with a score of 5 This course is repeatable for 99 credits.

IEPH 055NC. TOEFL PREPARATION. (6 Credits)
Course focuses on developing skills and familiarity with the TOEFL test in preparation for students taking the exam. Focus is on teaching test-taking strategies, developing methods for preparation and study, and filling in gaps in language skills. Students take practice tests and complete activities model on TOEFL test tasks. This course is repeatable for 99 credits.

Interdisciplinary Programs (IST)

IST 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

IST 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

IST 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IST 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

IST 511. INTRODUCTION TO INTERDISCIPLINARY GRADUATE STUDIES. (1 Credit)
First term graduate seminar for master's students in interdisciplinary studies to design their program of study; discover and access library and other university resources related to their fields of study; and practice synthesizing aspects of three differing fields.

IST 512. APPLYING AN INTERDISCIPLINARY PERSPECTIVE. (3 Credits)
Students will develop knowledge and skills in theory, research methods, and practice of approaching problems, issues, or events from an interdisciplinary perspective.
Recommended: IST 511
IST 513. INTERDISCIPLINARY RESEARCH COLLOQUIUM. (1 Credit)
Supports MAIS students as they conduct research for their thesis, research paper, or project, further their understanding how to synthesize multiple fields of study into a research project, and effectively employ this knowledge in preparation of the thesis/paper/project itself. Graded P/N.

International Degree (INTL)

INTL 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

INTL 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

INTL 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

INTL 405. PROJECTS: INTERNATIONAL PROJECTS. (1-16 Credits)
Projects of an international nature.
This course is repeatable for 16 credits.

INTL 406. SPECIAL PROGRAMS/SPECIAL TOPICS. (1-16 Credits)
Projects of an international nature.
This course is repeatable for 16 credits.

INTL 407. SEMINAR: INTERNATIONAL ISSUES. (1-16 Credits)
Advanced study of selected topics related to a variety of international issues.
This course is repeatable for 16 credits.

INTL 408. WORKSHOP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

INTL 410. INTERNSHIP: INTERNATIONAL INTERNSHIPS AND SEMINAR. (1-16 Credits)
Internships and seminars for students working abroad or working on an international project.
This course is repeatable for 16 credits.

INTL 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

INTL 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Italian (IT)

IT 111. FIRST-YEAR ITALIAN. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111, IT 112, IT 113. Not offered every year.

IT 112. FIRST-YEAR ITALIAN. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111, IT 112, IT 113. Not offered every year.
Prerequisites: IT 111 with D- or better

IT 113. FIRST-YEAR ITALIAN. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Designed for students with no previous training in Italian. Native speakers of Italian will not receive credit for IT 111, IT 112, IT 113. Not offered every year.
Prerequisites: IT 112 with D- or better

IT 188. ITALIAN STUDIES, ITALIAN STUDY CENTER. (1-12 Credits)
May be repeated for credit when topic varies. Section 1: Topics, Italian language. Section 2: Practical work (exercises).
This course is repeatable for 99 credits.

IT 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

IT 211. SECOND-YEAR ITALIAN. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers of Italian will not receive credit for IT 211, IT 212, IT 213. Not offered every year.
Prerequisites: IT 113 with D- or better

IT 212. SECOND-YEAR ITALIAN. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers of Italian will not receive credit for IT 211, IT 212, IT 213. Not offered every year.
Prerequisites: IT 211 with D- or better

IT 213. SECOND-YEAR ITALIAN. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers of Italian will not receive credit for IT 211, IT 212 IT 213. Completion of IT 213 with a grade of C- or better satisfies BA requirement in foreign languages. Not offered every year.
Prerequisites: IT 212 with D- or better

IT 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

IT 331. *ITALIAN CULTURE. (3 Credits)
An investigation of Italy through the wide-angle lens of social anthropology. Students will explore what is both known and unknown about Italy in its socio-political, broad cultural as well as regional, and media contexts (music, film, technology). Students' critical skills will be thoroughly solicited through online presentation and discussion. The course is taught in English. (Bacc Core Course) Attributes: CPWC – Core, Pers, West Culture

IT 360. ITALIAN CINEMA. (3 Credits)
A look at Italian cinema from film muto to the 21st century. Sub-genres including Epic Film, Neorealism, Italian Comedy, the Spaghetti Western, and New Italian Comedy will be examined within their socio-historical contexts. Taught in English.

IT 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

IT 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 16 credits.

IT 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

Japanese (JPN)

JPN 111. FIRST-YEAR JAPANESE. (4 Credits)
Designed to help students develop an understanding of basic language structures and to acquire the ability to use them appropriately in a variety of practical, everyday social contexts. Primary focus is on verbal and non-verbal communication skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Lec/lab/ rec.
JPN 112. FIRST-YEAR JAPANESE. (4 Credits)
Designed to help students develop an understanding of basic language structures and to acquire the ability to use them appropriately in a variety of practical, everyday social contexts. Primary focus is on verbal and non-verbal communication skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Lec/lab/rec.
Prerequisites: JPN 111 with D- or better

JPN 113. FIRST-YEAR JAPANESE. (4 Credits)
Designed to help students develop an understanding of basic language structures and to acquire the ability to use them appropriately in a variety of practical, everyday social contexts. Primary focus is on verbal and non-verbal communication skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 111, JPN 112, JPN 113. Lec/lab/rec.
Prerequisites: JPN 112 with D- or better

JPN 199. SPECIAL STUDIES: INTENSIVE JAPANESE. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 211. SECOND-YEAR JAPANESE. (4 Credits)
Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Lec/lab/rec.
Prerequisites: JPN 113 with D- or better

JPN 212. SECOND-YEAR JAPANESE. (4 Credits)
Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Lec/lab/rec.
Prerequisites: JPN 211 with D- or better

JPN 213. SECOND-YEAR JAPANESE. (4 Credits)
Continued development of basic oral communication skills as required in a variety of social contexts. Initial development of reading skills. Native and/or bilingual speakers of Japanese will not receive credit for JPN 211, JPN 212, JPN 213. Lec/lab/rec.
Prerequisites: JPN 212 with D- or better

JPN 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 311. THIRD-YEAR JAPANESE. (3 Credits)
Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. Lec/lab/rec.
Prerequisites: JPN 213 with C- or better or placement test

JPN 312. THIRD-YEAR JAPANESE. (3 Credits)
Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. Lec/lab/rec.
Prerequisites: JPN 311 with C- or better or placement test

JPN 313. THIRD-YEAR JAPANESE. (3 Credits)
Continued development of oral communication skills as required in a variety of social contexts. Further development of reading skills. Lec/rec.
Recommended: JPN 312

JPN 329. SPECIAL TOPICS IN LANGUAGE, CULTURE, OR LITERATURE. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 345. MULTIMODAL LITERACIES: JAPANESE. (2 Credits)
Introduction to the analysis and production of multimodal literacies. Study of semiotic resources such as language and images across modalities such as film, manga, and social media. Required of all majors in World Languages and Cultures. Taught in Japanese. Has to be taken in conjunction with the lecture session in English. Corequisites: WLC 345
Recommended: JPN 213

JPN 379. PROCTOR EXPERIENCE. (1-2 Credits)
Supervised practicum for advanced students, with assignment as proctor or tutor in lower-division Japanese courses. No credit may be used to satisfy requirements for a minor in Japanese. Graded P/N. This course is repeatable for 16 credits.

JPN 388. JAPANESE STUDIES, JAPANESE STUDY CENTER. (1-12 Credits)
May be repeated for credit when topic varies. This course is repeatable for 12 credits.

JPN 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 16 credits.

JPN 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

JPN 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

JPN 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

JPN 411. FOURTH-YEAR JAPANESE. (3 Credits)
Designed to help students apply grammatical points and expressions that they have learned from the first through the third year. It also stresses further development of reading and writing skills. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: JPN 313 with C- or better

JPN 412. FOURTH-YEAR JAPANESE. (3 Credits)
Further development of conversational, reading, and writing skills. Readings include excerpts from contemporary essays, short stories, novels, plays, and newspaper articles. Not offered every year.
Prerequisites: JPN 411 with C- or better

JPN 413. FOURTH-YEAR JAPANESE. (3 Credits)
Further development of conversational, reading, and writing skills. Readings include excerpts from contemporary essays, short stories, novels, plays, and newspaper articles. Not offered every year.
Prerequisites: JPN 412 with C- or better

JPN 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

JPN 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
Kinesiology (KIN)

KIN 131. INTRODUCTION TO KINESIOLOGY. (1 Credit)
Overview of the field; career opportunities in exercise and sport science and other professions dealing with the discipline of human movement; orientation to support services. Graded P/N.
Equivalent to: EXSS 131

KIN 132. INTRODUCTION TO THE ALLIED HEALTH PROFESSIONS. (1 Credit)
Overview of allied health professions including physical and occupational therapy, physician assistant, nursing, athletic training and others. Discuss job responsibilities, employment opportunities and educational requirements.
Equivalent to: EXSS 132

KIN 160. INTRODUCTION TO INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE. (3 Credits)
Introduction to management of physical activity-related injury for the non-healthcare provider (e.g., coaches, physical educators and fitness professionals).
Equivalent to: EXSS 160

KIN 194. PROFESSIONAL ACTIVITIES. (1-2 Credits)
Basic movement skills, basic rhythms, track and field.
Equivalent to: EXSS 194

KIN 199. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: EXSS 199
This course is repeatable for 16 credits.

KIN 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 230. INTRODUCTION TO ADVENTURE PROGRAMS. (3 Credits)
Foundation course for leadership opportunities in the Adventure Leadership Institute (ALI). Provides overview of history, theoretical foundations, and utilization of adventure programs in education, recreation, and therapy.
Equivalent to: EXSS 230

KIN 231. HUMAN GROUP DYNAMICS. (3 Credits)
Provides students with the fundamental concepts and theories essential for understanding dynamics that occur in groups in recreation, leisure, and everyday settings.
Equivalent to: EXSS 231

KIN 232. BACKCOUNTRY LEADERSHIP. (3 Credits)
Prepares students to be leaders in outdoor settings by building the practical and logistical skills needed in the effective delivery of courses and/or trips. Covers the teaching skills and essentials for trip leaders in the wilderness, including trip planning, logistics, risk management, and group interaction in the backcountry.
Prerequisites: (EXSS 230 with C or better or KIN 230 with C or better) and PAC 301 [C] and PAC 303 [C] and PAC 329 [C]
Equivalent to: EXSS 232

KIN 233. TEACHING TECHNIQUES FOR OUTDOOR ACTIVITIES. (3 Credits)
Gateway course for students pursuing the Level Three Adventure Leadership Certificate. Emphasizes teaching outdoor activities at a professional level. Students work individually with the course instructor to develop, plan and implement an activity course (land or water based) for the Adventure Leadership Institute.
Prerequisites: EXSS 232 with C or better or KIN 232 with C or better
Equivalent to: EXSS 233

KIN 299. SPECIAL TOPICS. (1-3 Credits)
Equivalent to: EXSS 299
This course is repeatable for 24 credits.

KIN 301. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 305. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 305
This course is repeatable for 16 credits.

KIN 306. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 306
This course is repeatable for 36 credits.

KIN 307. SEMINAR. (1-3 Credits)
Section 2: Seminar Pre-Internship (1 credit).
Equivalent to: EXSS 307
This course is repeatable for 36 credits.

KIN 311. MOTOR BEHAVIOR. (4 Credits)
Underlying mechanisms and factors affecting movement function, skill acquisition, and changes in movement behavior across the lifespan.
Prerequisites: BI 232 with C- or better or BI 332 with C- or better
Equivalent to: EXSS 311

KIN 312. *SOCIOCULTURAL DIMENSIONS OF PHYSICAL ACTIVITY. (4 Credits)
Physical activity in contemporary society. Relationships with the social processes; interrelationships between physical activity and cultural institutions. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture
Equivalent to: EXSS 312
Recommended: Social processes course

KIN 314. INTRODUCTION TO ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Overview of cognitive, neuromuscular, sensory and orthopedic disabilities; understanding accessible physical activity programs for individuals with disabilities.
Equivalent to: EXSS 314

KIN 321. BIOMECHANICS OF HUMAN MOVEMENT. (4 Credits)
Integration of the physical laws and anatomical structures governing human movement; qualitative analytical processes emphasized.
Prerequisites: ((BI 231 with C- or better and BI 241 [C-]) or (BI 331 [C-] and BI 341 [C-])) and (MTH 112 [C-] or MTH 251 [C-])
Equivalent to: EXSS 321

KIN 324. EXERCISE PHYSIOLOGY. (4 Credits)
Physiological effects of acute and chronic exercise; factors affecting human performance; exercise training principles.
Prerequisites: (BI 233 with C- or better or BI 333 with C- or better) and (BI 231 [C-] or BI 331 [C-]) and (CH 121 [C-] or CH 231 [C-] or CH 231H [C-]) and (CH 122 [C-] or CH 232 [C-] or CH 232H [C-]) and (CH 123 [C-] or CH 233 [C-] or CH 233H [C-] or CH 130 [C-])
Equivalent to: EXSS 324
KIN 325. FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION. (3 Credits)
Introduction to lab- and field-based physical fitness assessments and the
skills needed to design safe and effective exercise programs for
apparently healthy adults. Lec/lab.
Prerequisites: KIN 324 with C- or better or EXSS 324 with C- or better
Equivalent to: EXSS 325

KIN 333. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Equivalent to: EXSS 333

KIN 334. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Prerequisites: KIN 333 with C- or better
Equivalent to: EXSS 334

KIN 335. KINESIOLOGY PRACTICUM. (2 Credits)
Field experience in kinesiology under professional supervision.
Equivalent to: EXSS 335

KIN 341. NUTRITION FOR EXERCISE. (3 Credits)
Review of the interrelationship between nutrition and exercise, including
macronutrient, micronutrient and fluid needs for active individuals.
CROSSLISTED as KIN 341/NUTR 341.
Prerequisites: KIN 324 with C- or better and NUTR 240 [C-]
Equivalent to: EXSS 341, NUTR 341

KIN 343. PRE-THERAPY/ALLIED HEALTH SEMINAR. (1 Credit)
Provides knowledge in professional school preparation and current
issues related to the allied health professions.
Prerequisites: (KIN 132 with C or better or BI 109 with C or better) and
BI 231 [C] and BI 232 [C] and BI 233 [C] and BI 241 [C] and BI 242 [C] and
BI 243 [C]
Equivalent to: EXSS 343
Recommended: Overall GPA of 3.0

KIN 344. PRE-THERAPY/ALLIED HEALTH PRACTICUM. (1 Credit)
Clinical field experiences under the supervision of a licensed professional
in the allied health or related setting enhanced with classroom
discussion.
Prerequisites: KIN 132 with C or better and BI 231 [C] and BI 232 [C] and
BI 233 [C] and BI 241 [C] and BI 242 [C] and BI 243 [C]
Corequisites: KIN 343
Equivalent to: EXSS 344
This course is repeatable for 2 credits.
Recommended: Overall GPA of 3.0

KIN 345. ALLIED HEALTH PRACTICUM. (1-2 Credits)
Field experience under professional supervision in an allied health or
related setting. Includes arranged consultations with the instructor to
discuss current issues related to the allied health professions.
Equivalent to: EXSS 345
This course is repeatable for 2 credits.
Recommended: Overall GPA 2.75

KIN 353. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May
include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 353
Recommended: OSU GPA 2.00, KIN GPA 2.50, and completion or
concurrent enrollment in KIN 422 or KIN 423

KIN 354. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May
include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 354
Recommended: OSU GPA 2.00, KIN GPA 2.50 and concurrent enrollment
in KIN 422 or KIN 423

KIN 355. PHYSICAL EDUCATION TEACHER EDUCATION PRACTICUM. (2 Credits)
Supervised K-12 physical education field experience with seminars. May
include one instructor-approved coaching experience in school setting.
Equivalent to: EXSS 355
Recommended: OSU GPA 2.00, KIN GPA 2.50 and concurrent enrollment
in KIN 422 or KIN 423

KIN 360. INJURY MANAGEMENT FOR THE PHYSICALLY ACTIVE. (3 Credits)
Introduction to management of physical activity-related injury for the
non-healthcare provider (e.g., coaches, physical educators and fitness
professionals) and pre-professional.

KIN 370. PSYCHOLOGY OF SPORT AND PHYSICAL ACTIVITY. (3 Credits)
Interaction between psychological variables and human motor
performance.
Equivalent to: EXSS 370

KIN 380. THERAPEUTIC MODALITIES. (4 Credits)
Indications, contraindication, techniques, and effects of various physical
agents used in the care and treatment of musculoskeletal injuries and
diseases.
Equivalent to: EXSS 380

KIN 385. THERAPEUTIC EXERCISE. (4 Credits)
Principles and techniques of therapeutic exercise; rehabilitative activities
and programs for musculoskeletal injuries, conditions, and diseases. Lec/
lab.
Prerequisites: KIN 321 with C- or better or EXSS 321 with C- or better
Equivalent to: EXSS 385

KIN 394. PROFESSIONAL ACTIVITIES: RESISTANCE TRAINING
PROGRAM DESIGN. (3 Credits)
Principles and techniques of therapeutic exercise; rehabilitative activities
and programs for musculoskeletal injuries, conditions, and diseases. Lec/
lab.
Prerequisites: KIN 324 with C- or better and KIN 325 [C-]
Equivalent to: EXSS 394

KIN 395. PROFESSIONAL ACTIVITIES: GROUP FITNESS. (3 Credits)
Clinical field experiences under the supervision of a licensed professional
in the allied health or related setting enhanced with classroom
discussion.
Prerequisites: KIN 132 with C or better and BI 109 with C or better) and
BI 231 [C] and BI 232 [C] and BI 233 [C] and BI 241 [C] and BI 242 [C] and
BI 243 [C]
Corequisites: KIN 343
Equivalent to: EXSS 344
This course is repeatable for 2 credits.
Recommended: Overall GPA of 3.0

KIN 396. PROFESSIONAL ACTIVITIES: AQUATICS. (3 Credits)
Clinical field experiences under the supervision of a licensed professional
in the allied health or related setting enhanced with classroom
discussion.
Prerequisites: KIN 132 with C or better or EXSS 324 with C- or better
and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 395

KIN 399. SPECIAL TOPICS. (1-3 Credits)
Equivalent to: EXSS 399, KIN 399H
This course is repeatable for 18 credits.
KIN 399H. SPECIAL TOPICS. (1-3 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: KIN 399
This course is repeatable for 18 credits.

KIN 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 401
This course is repeatable for 16 credits.

KIN 403. THESIS. (1-16 Credits)
Equivalent to: EXSS 403
This course is repeatable for 16 credits.

KIN 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 405
This course is repeatable for 16 credits.

KIN 406. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 406
This course is repeatable for 16 credits.

KIN 407. SEMINAR. (1-16 Credits)
Equivalent to: EXSS 407
This course is repeatable for 16 credits.

KIN 408. WORKSHOP. (1-16 Credits)
Equivalent to: EXSS 408
This course is repeatable for 16 credits.

KIN 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

KIN 410. INTERNSHIP. (1-15 Credits)
Planned experiences at selected cooperating agencies, companies or institutions; supervised by university and program personnel; supplementary conference, reports and appraisal required.
Equivalent to: EXSS 410
This course is repeatable for 20 credits.

Recommended: Completion of required courses, cumulative Kinesiology program GPA of 2.25, KIN overall GPA of 2.50 and completion of 165 credits

KIN 411. NEUROMUSCULAR CONTROL OF HUMAN MOVEMENT. (3 Credits)
Exploration and understanding of the neurological basis of human movement with emphasis on models of motor function and dysfunction.
Prerequisites: KIN 311 with C- or better

KIN 422. FACILITATING PHYSICAL ACTIVITY FOR CHILDREN AND YOUTH. (3 Credits)
Students learn skills for facilitating physical activity programs for children and youth in a variety of settings, including information on the benefits of physical activity, program design, implementation and management techniques.
Prerequisites: KIN 311 with C- or better or EXSS 311 with C- or better
Equivalent to: EXSS 422

KIN 423. QUALITATIVE MOVEMENT ANALYSIS. (3 Credits)
Develop observational skills to perform systematic qualitative analyses of selected physical activity performances and other human movements.
Prerequisites: (KIN 311 with C- or better or EXSS 311 with C- or better)
and (KIN 321 [C] or EXSS 321 [C])
Equivalent to: EXSS 423

KIN 425. ANATOMICAL KINESIOLOGY. (4 Credits)
Anatomical aspects of human movement; actions of bones and muscles in motor activities. Application of physical principles to factors governing anatomical function in health and injury.
Prerequisites: EXSS 321 with C- or better or KIN 321 with C- or better
Equivalent to: EXSS 425

KIN 432. PHYSICAL ACTIVITY ASSESSMENT. (3 Credits)
Assessment of physical activity using subjective and objective measurement methods with focus on applications for individuals, communities, and special populations.
Equivalent to: EXSS 432

KIN 434. APPLIED MUSCLE PHYSIOLOGY. (3 Credits)
Skeletal muscle structure, function, and metabolism; applications to muscle fatigue, exercise training, inactivity, and aging.
Prerequisites: KIN 324 with C- or better or EXSS 324 with C- or better
Equivalent to: EXSS 434

KIN 435. PHYSICAL ACTIVITY PROMOTION. (3 Credits)
Application of behavioral science and public health research to the promotion of physical activity in individuals, groups and communities.
Prerequisites: KIN 370 with C- or better
Equivalent to: EXSS 435

KIN 437. PHYSICAL ACTIVITY, AGING, AND CHRONIC DISEASE. (4 Credits)
Addresses the consequences of primary and secondary aging from an individual and public health perspective. Physiological changes associated with aging and chronic disease, functional assessment of older adults, and exercise prescription for older adults with and without chronic exercise will be emphasized.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better)
and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 437

KIN 444. ADVANCED ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Discuss various disability models and perspectives; reinforce determinants of physical activity; design and implement different physical activity programs and curricula for individuals with disabilities.
Lec/lab.
Prerequisites: (KIN 314 with C- or better or EXSS 314 with C- or better)
Equivalent to: EXSS 444

KIN 462. BEHAVIORAL DIMENSIONS OF PHYSICAL ACTIVITY. (4 Credits)
Adopting and maintaining an active, healthy lifestyle is difficult. This course explores ‘why’ this might be the case and ‘how’ to improve upon the situation.
Prerequisites: KIN 312 with C- or better and KIN 370 [C-]

KIN 474. EXERCISE PHYSIOLOGY LAB METHODS. (3 Credits)
Practical experience and projects in exercise physiology lab methods, including measurement of submaximal and maximal oxygen consumption, body composition, anaerobic power, and electrocardiography.
Prerequisites: (KIN 324 with C- or better or EXSS 324 with C- or better)
and (KIN 325 [C-] or EXSS 325 [C-])
Equivalent to: EXSS 474
KIN 475. *POWER AND PRIVILEGE IN SPORT. (3 Credits)
Issues of power and privilege in sport including race, gender, sexual orientation, disability and aggression and the consequences of long held society norms and stereotypes. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: (KIN 312 with C- or better or EXSS 312 with C- or better)
Recommended: 6 credits of social science

KIN 481. *ANALYSIS OF CRITICAL ISSUES IN KINESIOLOGY. (3 Credits)
Reading and interpreting current research, and using writing as a tool for learning on a critical issue in kinesiology. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: KIN 381

KIN 483. TISSUE INJURY AND REPAIR. (3 Credits)
Mechanics of tissue injury and the body's response and repair following injury of bone, muscle, tendon, ligament, cartilage and nervous system tissue.
Prerequisites: (BI 231 with C- or better or BI 331 with C- or better) and (BI 241 [C-] or BI 341 [C-]) and (BI 232 [C-] or BI 332 [C-]) and (BI 242 [C-] or BI 342 [C-]) and (BI 233 [C-] or BI 333 [C-]) and (BI 243 [C-] or BI 343 [C-]) or ((Z 331 [C-] and Z 332 [C-] and Z 333 [C-] and Z 341 [C-] and Z 342 [C-] and Z 343 [C-])
Equivalent to: EXSS 483

KIN 490. SCIENTIFIC INQUIRY IN KINESIOLOGY. (4 Credits)
Principles and techniques of organization, administration, interpretation and evaluation of exercise science-related data. Includes human subjects training and certification, research design, and statistical analysis using SPSS and Excel including central tendency, correlation and regression, probability, and inferential statistics (t-tests and ANOVA). Lec/lab.
Prerequisites: KIN 325 with C- or better and MTH 112 [C-]

KIN 499. SELECTED TOPICS. (1-5 Credits)
Impact of human movement development on people, their movement behavior, and environment. Topics vary from term to term and year to year. May be repeated for credit when topics differ.
Equivalent to: EXSS 499
This course is repeatable for 24 credits.

KIN 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 501
This course is repeatable for 16 credits.

KIN 503. THESIS. (1-16 Credits)
Equivalent to: EXSS 503
This course is repeatable for 999 credits.

KIN 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 505
This course is repeatable for 16 credits.

KIN 506. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 506
This course is repeatable for 16 credits.

KIN 507. SEMINAR. (1-16 Credits)
Section 1: Seminar (1). Graduate research seminar that emphasizes student oral presentations of current research topics in exercise and sport science. One credit required for all graduate students. Section 2: Current Developments (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. Two credits required of all doctoral students. Section 9: International Aspects (1). Discussion of international aspects of study in exercise and sport science. Required of all doctoral students. Graded P/N.
Equivalent to: EXSS 507
This course is repeatable for 16 credits.

KIN 508. WORKSHOP. (1-16 Credits)
Equivalent to: EXSS 508
This course is repeatable for 16 credits.

KIN 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 35 credits.

KIN 510. INTERNSHIP. (1-16 Credits)
Planned experiences at selected cooperating agencies, companies or institutions; supervised by university and program personnel; supplementary conference, reports and appraisal required.
Equivalent to: EXSS 510
This course is repeatable for 26 credits.

KIN 511. INTRODUCTION TO ATHLETIC TRAINING. (4 Credits)
Practice domains include injury and illness prevention and wellness protection, clinical evaluation and diagnosis, immediate and emergency care, treatment and rehabilitation, and organizational and professional health and well-being. Lec/lab.

KIN 512. APPLIED MOTOR LEARNING. (3 Credits)
Application of research and theory to the teaching of motor skills with emphasis on development of instructional strategies related to modeling, knowledge of results, practice, and motivational aspects of learning.
Equivalent to: EXSS 512
Recommended: KIN 311

KIN 513. MOTOR DEVELOPMENT: AN INTEGRATIVE APPROACH. (3 Credits)
Addresses the social, cultural, biological and psychological processes and health-related factors (e.g., physical activity) that jointly influence lifespan motor development (emphasis on the early years).

KIN 515. MOTOR CONTROL AND MOVEMENT DYSFUNCTION. (3 Credits)
Contemporary motor control theories and their application to the development of instructional and training programs for individuals with movement disorders caused by neurological disease and/or trauma.
Equivalent to: EXSS 515
Recommended: KIN 311 and (KIN 314 or KIN 444)

KIN 520. ORTHOPEDIC ASSESSMENT OF UPPER EXTREMITY INJURIES. (4 Credits)
Prevention, assessment and management of upper extremity injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 511 with C or better

KIN 521. ORTHOPEDIC ASSESSMENT OF LOWER EXTREMITY INJURIES. (4 Credits)
Prevention, assessment and management of lower extremity injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 511 with C or better

KIN 522. ORTHOPEDIC ASSESSMENT OF SPINE. (4 Credits)
Prevention, assessment and management of spinal injuries and conditions commonly encountered by the athletic trainer. Lec/lab.
Prerequisites: KIN 520 with C or better and KIN 521 [C]
KIN 523. BIOMECHANICS OF MOTOR ACTIVITIES. (3 Credits)
Kinematic and kinetic analysis of volitional human movement with emphasis on analytical techniques and quantitative problem solving.
Equivalent to: EXSS 523
Recommended: KIN 323 or PH 201

KIN 525. BIOMECHANICS OF MUSCULOSKELETAL INJURY. (3 Credits)
Mechanical causes and effects of forces applied to the musculoskeletal system, material properties of human tissues, pathomechanics of injury, and degenerative changes across the lifespan. Not offered every year.
Equivalent to: EXSS 525

KIN 531. PHYSIOLOGY OF PHYSICAL ACTIVITY AND INACTIVITY. (3 Credits)
Physiologic responses to acute and chronic physical activity and inactivity with emphasis on underlying mechanisms and health outcomes.

KIN 532. PHYSICAL ACTIVITY ASSESSMENT. (3 Credits)
Assessment of physical activity using subjective and objective measurement methods with focus on applications for individuals, communities, and special populations.
Equivalent to: EXSS 532

KIN 533. ENERGETICS AND BIOCHEMISTRY OF EXERCISE. (3 Credits)
Metabolic and energetic responses to acute and chronic physical activity; emphasis on recent research.
Equivalent to: EXSS 533
Recommended: Undergraduate course in biochemistry or exercise physiology.

KIN 535. PHYSICAL ACTIVITY PROMOTION. (3 Credits)
Application of behavioral science and public health research to the promotion of physical activity in individuals, groups and communities.
Recommended: KIN 370

KIN 536. PHYSICAL ACTIVITY IN DIVERSE POPULATIONS. (3 Credits)
Addresses the social, cultural, political, and environmental determinants of physical activity and health among diverse populations. Includes examination of intersecting issues related to race, ethnicity, gender, age, disability, geography, income status, and other societal factors across the lifespan for promoting physical activity through public health strategies.

KIN 544. ADVANCED ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Discuss various disability models and perspectives; reinforce determinants of physical activity; design and implement different physical activity programs and curricula for individuals with disabilities. Lec/lab.
Equivalent to: EXSS 544
Recommended: KIN 314

KIN 547. INCLUSION IN PHYSICAL ACTIVITY. (3 Credits)
Effectiveness of physical activity programs provided in inclusive settings. This will include a lifespan/non-categorical approach to program development.
Equivalent to: EXSS 547
Recommended: KIN 314 or KIN 444

KIN 548. ASSESSMENT AND PROGRAMMING FOR SPECIAL POPULATIONS. (3 Credits)
Use of appropriate assessment procedures for developing effective psychomotor programs for the disabled.
Equivalent to: EXSS 548
Recommended: KIN 314 or KIN 444

KIN 549. PHYSICAL ACTIVITY FOR PERSONS WITH SEVERE DISABILITIES. (3 Credits)
Plan, develop and implement appropriate physical activity programs, functional program design, assistive technology, instructional strategies, behavior management practices, and data analysis systems that address the needs for psychomotor performance of persons with low incidence disabilities.
Equivalent to: EXSS 549
Recommended: KIN 314 or KIN 444

KIN 550. HEALTH PROMOTION FOR PEOPLE WITH DISABILITIES. (3 Credits)
Discussion will focus on disability and health, theory driving health promotion program development, guidelines for developing a program for individuals with disabilities, and program evaluation.
Equivalent to: EXSS 550

KIN 551. CURRENT TRENDS AND ISSUES IN PHYSICAL EDUCATION. (4 Credits)
Current trends and issues in physical education, including curriculum development, professional ethics, instructional practices, and physical activity for the school community.

KIN 553. INSTRUCTIONAL ANALYSIS TECHNIQUES I. (3 Credits)
Introduction to techniques of instructional analysis. Provides in-depth information and training in systematic observation techniques, raw data conversion and inter/intraobserver reliability.
Equivalent to: EXSS 553

KIN 554. INSTRUCTIONAL ANALYSIS TECHNIQUES II. (3 Credits)
Laboratory/seminar experience to accompany student teaching winter and spring terms. Provides continued application of systematic observation techniques throughout the elementary student teaching experience.
Equivalent to: EXSS 554

KIN 555. SKILL ANALYSIS AND ASSESSMENT IN K-12. (3 Credits)
Develop proficiency in assessing movement skills, execution of sport techniques, and game play performance. Assessment trends and practices utilized in physical education programs are included.
Equivalent to: EXSS 555

KIN 556. INSTRUCTIONAL SKILLS I. (3 Credits)
Skills of planning, implementing, and evaluating programs of instruction in physical education, grades K-12.
Equivalent to: EXSS 556

KIN 557. INSTRUCTIONAL SKILLS II. (2 Credits)
Applying and refining skills of planning, implementing, and evaluating programs of instruction in physical education, grades K-12.
Equivalent to: EXSS 557

KIN 558. PHYSICAL EDUCATION CURRICULUM DESIGN AND ORGANIZATION. (3 Credits)
Curricular programs and variations from kindergarten through grade 12, administrative policies and practices.
Equivalent to: EXSS 558

KIN 559. THE PHYSICAL EDUCATOR AS A PROFESSIONAL. (1 Credit)
Transitioning to teaching, developing a portfolio, certification, obtaining a position, teacher burnout, professionalism, problems of first-year teachers, developing patterns of behavior that lead to a successful career.
Equivalent to: EXSS 559
KIN 560. MOTIVATION IN PHYSICAL ACTIVITY. (3 Credits)
A social psychological approach to understanding the role of self-perceptions and cognitions in explaining motivated behavior in sport and exercise settings.
Equivalent to: EXSS 560
Recommended: KIN 370

KIN 561. PSYCHOSOCIAL FACTORS IN PHYSICAL ACTIVITY. (3 Credits)
A social psychological approach to understanding the role of social interactions and contextual factors in explaining human behavior in sport and exercise settings.
Equivalent to: EXSS 561
Recommended: KIN 560

KIN 562. LIFESPAN SPORT AND EXERCISE PSYCHOLOGY. (3 Credits)
Social-psychological issues across the lifespan in the context of sport and exercise.
Equivalent to: EXSS 562
Recommended: KIN 561

KIN 564. PROGRAM CAPSTONE AND SYNTHESIS. (3 Credits)
Capstone course in which teacher candidates will review and update their teaching philosophy; showcase their Physical Education master's portfolio; and develop a plan for professional development.
Prerequisites: KIN 510 with C or better

KIN 565. EMERGENCY MANAGEMENT OF SPORTS INJURIES. (3 Credits)
Knowledge and skills related to the specialized care required for serious and/or life-threatening acute athletic related injuries and illnesses. Lec/lab.
Prerequisites: KIN 566 with C or better

KIN 566. GENERAL MEDICAL ASSESSMENT. (4 Credits)
Prevention, evaluation, diagnosis, and management of general medical conditions commonly encountered by the athletic trainer.
Prerequisites: KIN 565 with C or better

KIN 567. PHARMACOLOGY IN ATHLETIC TRAINING. (3 Credits)
Pharmacology in sports medicine, topics including, but not limited to, the mechanisms and actions of drugs commonly administered and prescribed in sports medicine environments.
Prerequisites: KIN 566 with C or better

KIN 568. ATHLETIC TRAINING PROGRAM MANAGEMENT. (3 Credits)
Administrative aspects of athletic training program management. Including principles of risk management, strategic and operational planning, medical-legal aspects of athletic healthcare, confidentiality and documentation of patient health information, insurance and third-party reimbursement, personnel issues, and current professional issues.
Prerequisites: KIN 522 with C or better

KIN 569. SPECIAL TOPICS. (1-3 Credits)
Impact of human movement development on people, their movement behavior, and environment. Topics vary from term to term and year to year. May be repeated when topics differ.
Equivalent to: EXSS 599
This course is repeatable for 99 credits.

KIN 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: EXSS 601
This course is repeatable for 16 credits.

KIN 603. THESIS. (1-16 Credits)
Equivalent to: EXSS 603
This course is repeatable for 999 credits.

KIN 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: EXSS 605
This course is repeatable for 16 credits.

KIN 606. PROJECTS. (1-16 Credits)
Equivalent to: EXSS 606
This course is repeatable for 16 credits.

KIN 607. SEMINAR. (1-16 Credits)
Section 1: Graduate Research (1). Seminar emphasizes student oral presentations of current research topics in exercise and sport science. One credit required of all graduate students. Section 3: Current Developments (1). Discussion of contemporary issues in the exercise and sport science literature. Topics vary by term. Two credits required of all doctoral students. Section 9: International Aspects (1). Discussion of international aspects of study in exercise and sport science. Required of all doctoral students. Graded P/N.
Equivalent to: EXSS 607
This course is repeatable for 16 credits.

KIN 610. PROFESSIONAL INTERNSHIP: PHYSICAL EDUCATION. (1-15 Credits)
Field experience in which the term will integrate academic study with classroom teaching experience to learn specific competencies relating to functioning well in the context of the classroom and the school, and demonstrate this competency through the assessment of work by supervisors and by evidence collected and presented in work samples.
Equivalent to: EXSS 610
This course is repeatable for 25 credits.
KIN 647. CURRENT TOPICS AND RESEARCH IN ADAPTED PHYSICAL ACTIVITY. (3 Credits)
Current trends and critical research issues in adapted physical activity; focus on international and national trends. Topic will be variable.
Equivalent to: EXSS 647

KIN 699. SPECIAL TOPICS. (1-16 Credits)
Current issues, trends, and topics in KIN research. May be repeated for credit with different topics.
Equivalent to: EXSS 699
This course is repeatable for 25 credits.

Korean (KOR)

KOR 111. FIRST-YEAR KOREAN. (4 Credits)
For students with no prior training in Korean. Basic language skills along with cultural understanding by introducing the history of Hangul, traditional holidays, games, songs, foods and drama. Provides the Korean alphabet (Hangul), basic vocabulary, grammar, listening, speaking, reading, and writing skills. Three areas of focus: (1) reading and writing the Korean alphabet; (2) basic colloquial expressions; and (3) cultural understanding.
Prerequisites: KOR 111 with D- or better

KOR 112. FIRST-YEAR KOREAN. (4 Credits)
Basic language skills along with cultural understanding by introducing the history of Hangul, traditional holidays, games, songs, foods and drama. Provides the Korean alphabet (Hangul), basic vocabulary, grammar, listening, speaking, reading, and writing skills. Three areas of concentration: (1) reading and writing the Korean alphabet; (2) basic colloquial expressions; and (3) cultural understanding.
Prerequisites: KOR 111 with D- or better

KOR 113. FIRST-YEAR KOREAN. (4 Credits)
Designed to increase fluency in listening, speaking, reading and writing skills through various topics that are relevant to students' life; sports, health, experiences, housing. Enlarge vocabulary and knowledge of grammar and sentence structure with honorifics, adjectives, connectives, and comparatives. Discuss Korean culture and literature using folk tales.
Prerequisites: KOR 112 with D- or better

KOR 211. SECOND-YEAR KOREAN. (4 Credits)
Designed to increase fluency in listening, speaking, reading, and writing skills through pragmatic topics necessary for survival in the target language culture. Topic-based lessons consist of model dialogues, narration, vocabulary, grammar and culture corresponding to the level of intermediate low (ACTFL).
Prerequisites: KOR 113 with D or better or Korean 113 with a score of 1

KOR 212. SECOND-YEAR KOREAN. (4 Credits)
Designed to increase fluency in listening, speaking, reading, and writing skills through pragmatic topics necessary for survival in the target language culture. Topic-based lessons consist of model dialogues, narration, vocabulary, grammar, and culture corresponding to the level of Intermediate Mid (ACTFL). Students learn to describe favorite activities, feelings, foods, restaurants, fashions, colors, and physical appearances. Students also learn to engage in a conversation as well as to write compositions related to daily life, making recommendations, asking for and giving directions, making a telephone call, and writing a recipe.
Prerequisites: KOR 211 with D or better

KOR 213. SECOND-YEAR KOREAN. (4 Credits)
Designed to increase fluency in integrated language skills through pragmatic topics necessary for survival in target language culture. Topic-based lesson consists of model dialogues, narration, vocabulary, grammar and culture corresponding to the intermediate high level. Students will learn to speak in paragraph length conversations; write compositions related to their daily lives, and such social needs as giving suggestions, making appointments and plans, giving descriptions and excuses, asking for and giving advice for a job interview. Visual media makes learning more fun and authentic. Students are required to participate in face-to-face meetings on a regular basis with a weekly partner and the instructor.
Prerequisites: KOR 212 with D or better

Leadership (LEAD)

LEAD 242. PERSONAL LEADERSHIP DEVELOPMENT. (3 Credits)
Examines content related to leadership traits, styles, and effective leadership tactics. An introductory course designed to create awareness and develop the employability skills necessary for participants to be productive contributors in their school, home, community and profession.
Equivalent to: AG 242

LEAD 342. TEAM AND ORGANIZATIONAL LEADERSHIP. (3 Credits)
Examines the planning, implementation and evaluation of organizations, and challenges students in the development of effective communication, group dynamics, conflict management, teambuilding and problem solving. Students will be challenged to examine their leadership role in their school, community and profession.
Equivalent to: AG 342

LEAD 401. LEADERSHIP RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 410. LEADERSHIP INTERNSHIP. (1-16 Credits)
Students apply what they have learned through both the leadership theory and trait/skill development portion of the Leadership minor. This course is repeatable for 16 credits.

LEAD 442. LEADERSHIP SKILLS FOR CAREER SUCCESS. (3 Credits)
Focuses on the development and refinement of the following leadership skills: utilizing diversity, team building, project management, program planning models, working with difficult people, conflict management, leading change, establishing an effective network, organizational strategies, and emotional intelligence.
Equivalent to: AG 442

LEAD 443. LEADERSHIP THROUGH CONVERSATIONS. (3 Credits)
Engages students in the exploration of conversations as a component of leadership. Students will engage in topics related to developing effective conversations, listening, conversation styles, group dynamics, digital communication, meetings as conversations and interviewing skills.
Equivalent to: AG 442
LEAD 444. LEADERSHIP MINOR CAPSTONE. (2 Credits)
Capstone course for students completing the Leadership minor. Students will reflect on what they have learned through the Leadership minor and how to apply that learning in the context of their future careers.
Equivalent to: AG 444
Recommended: (AG 242 or LEAD 242) and (AG 342 or LEAD 342)

LEAD 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 506. SPECIAL PROBLEMS/SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

LEAD 542. LEADERSHIP SKILLS FOR CAREER SUCCESS. (3 Credits)
Focuses on the development and refinement of the following leadership skills: utilizing diversity, team building, project management, program planning models, working with difficult people, conflict management, leading change, establishing an effective network, organizational strategies, and emotional intelligence.
Equivalent to: AG 542

LEAD 543. LEADERSHIP THROUGH CONVERSATIONS. (3 Credits)
Engages students in the exploration of conversations as a component of leadership. Students will engage in topics related to developing effective conversations, listening, conversation styles, group dynamics, digital communication, meetings as conversations and interviewing skills.
Equivalent to: AG 543

LEAD 580. LEADING AUTHENTICALLY: FOUNDATIONS OF LEADERSHIP. (3 Credits)
The foundational course for students in graduate leadership coursework. Students will explore leadership theories to develop an understanding of how to be an authentic leader. Students will analyze and apply course content in relation to their own personal leadership experiences and gain perspectives and tools to influence their future.

LEAD 581. LEADING OTHERS: ENHANCING TEAM AND ORGANIZATIONAL PERFORMANCE. (3 Credits)
A foundational course for group, team, and organizational leadership. Throughout this course, you will become familiar with the necessary conditions for designing effective teams and work groups, best practices and processes needed for maximum productivity, strategies to resolve common issues in teams, and methods to evaluate team performance.

LEAD 582. LEADING CHANGE: LEADING, MOTIVATING, AND EMPOWERING OTHERS. (3 Credits)
Examines and synthesizes leadership content to form a personal and professional foundation for being remarkable. Drawing on 15 different being remarkable qualities, students will be challenged to develop and apply the skills needed for leadership success.

### Liberal Arts (LA)

LA 199. SPECIAL TOPICS. (2 Credits)
Various topics introducing students to the liberal arts.
This course is repeatable for 6 credits.

LA 399. SPECIAL TOPICS. (1-12 Credits)
This course is repeatable for 12 credits.

### Liberal Studies (LS)

LS 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

LS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

LS 405. READING AND CONFERENCE. (1-3 Credits)
This course is repeatable for 16 credits.

LS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

LS 407. SEMINAR. (1-16 Credits)
Graduate credit must not exceed 9 credits.
This course is repeatable for 16 credits.

LS 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

LS 410. INTERNSHIP. (1-12 Credits)
Restricted to students enrolled in off-campus programs. Not available to students in residence on the Corvallis campus. Maximum of 12 credits.
This course is repeatable for 12 credits.

LS 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

### Library & Information Science (LIB)

LIB 410. INTERNSHIP. (1-16 Credits)
The internship is an opportunity to gain experience that connects a student's discipline or interests to contemporary issues faced by cultural heritage organizations, such as libraries, archives, special collections and in publishing. OSU Libraries or Press focuses on contemporary issues concerning information and society and digital and print collections. Students will work with an on-site mentor who guides their field experience in collaboration with the internship coordinator at OSU Libraries. Graded P/N.
This course is repeatable for 16 credits.

LIB 510. INTERNSHIP. (1-16 Credits)
The internship is an opportunity to gain experience that connects a student's discipline or interests to contemporary issues faced by cultural heritage organizations, such as libraries, archives, special collections and in publishing. OSU Libraries or Press focuses on contemporary issues concerning information and society and digital and print collections. Students will work with an on-site mentor who guides their field experience in collaboration with the internship coordinator at OSU Libraries. Graded P/N.
This course is repeatable for 16 credits.
Linguistics (LING)

LING 111. CLASSROOM STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (4 Credits)
Beginning classroom-based instruction of a language otherwise not taught at OSU. Skill areas addressed include reading, writing, speaking, listening, and culture. Not for students who have previous proficiency in the target language. May be repeated for credit for different languages. For a master-apprentice approach, enroll instead in the LING 114, LING 115, LING 116 sequence.
This course is repeatable for 12 credits.

LING 112. CLASSROOM STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (4 Credits)
Beginning classroom-based instruction of a language otherwise not taught at OSU. Skill areas addressed include reading, writing, speaking, listening, and culture. Not for students who have previous proficiency in the target language. May be repeated for credit for different languages. For a master-apprentice approach, enroll instead in the LING 114, LING 115, LING 116 sequence.
This course is repeatable for 12 credits.

LING 113. CLASSROOM STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (4 Credits)
Beginning classroom-based instruction of a language otherwise not taught at OSU. Skill areas addressed include reading, writing, speaking, listening, and culture. Not for students who have previous proficiency in the target language. May be repeated for credit for different languages. For a master-apprentice approach, enroll instead in the LING 114, LING 115, LING 116 sequence.
This course is repeatable for 12 credits.

LING 114. MASTER/APPRENTICE STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (1-4 Credits)
LING 114, LING 115, and LING 116 provides context-rich beginning language instruction, in close collaboration with a native speaker, of a language otherwise not taught at OSU. Learners work toward a level of communicative proficiency approaching the intermediate low level in each of the primary skill areas. Four credits of one language are required before moving on to the next course in the sequence. May be repeated for credit for up to three languages. Not for students who have previous proficiency in the target language.
This course is repeatable for 12 credits.

LING 115. MASTER/APPRENTICE STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (1-4 Credits)
LING 114, LING 115, and LING 116 provides context-rich beginning language instruction, in close collaboration with a native speaker, of a language otherwise not taught at OSU. Learners work toward a level of communicative proficiency approaching the intermediate low level in each of the primary skill areas. Four credits of one language are required before moving on to the next course in the sequence. May be repeated for credit for up to three languages. Not for students who have previous proficiency in the target language.
This course is repeatable for 12 credits.

LING 116. MASTER/APPRENTICE STUDY OF A LESS COMMONLY TAUGHT LANGUAGE. (1-4 Credits)
LING 114, LING 115, and LING 116 provides context-rich beginning language instruction, in close collaboration with a native speaker, of a language otherwise not taught at OSU. Learners work toward a level of communicative proficiency approaching the intermediate low level in each of the primary skill areas. Four credits of one language are required before moving on to the next course in the sequence. May be repeated for credit for up to three languages. Not for students who have previous proficiency in the target language.
This course is repeatable for 12 credits.

LING 199. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 208. *WESTERN CULTURE STUDY ABROAD. (3 Credits)
Overseas study of the history and contemporary form of important features of Western culture. Based on at least 10 weeks of studying abroad. CROSSLISTED as ANTH 208/LING 208. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: ANTH 208

LING 209. *CULTURAL DIVERSITY STUDY ABROAD. (3 Credits)
Overseas study of non-Western cultures. Based on at least 10 weeks of studying abroad. CROSSLISTED as ANTH 209/LING 209. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: ANTH 209

LING 251. *LANGUAGES OF OREGON. (3 Credits)
Basic lessons in languages spoken in Oregon's minority language communities presented by native informants; discussion, language analysis, and assessment facilitated by linguistics faculty. Languages presented will vary. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: LING 251H

LING 299. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 401. RESEARCH. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 16 credits.

LING 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LING 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

LING 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LING 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LING 410. INTERNSHIP. (1-15 Credits)
This course is repeatable for 16 credits.

LING 451. GENERAL LINGUISTICS. (3 Credits)
Language systems; comparative philology; historical, descriptive, and structural linguistics; semantics; phonetics and phonemics. Not offered every year.
Recommended: 9 credits upper-division foreign language training
LING 499. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

LING 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

LING 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

LING 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

LING 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

LING 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

LING 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

LING 510. INTERNSHIP. (1-15 Credits)
This course is repeatable for 15 credits.

LING 545. METHODS AND MATERIALS FOR SECOND LANGUAGE ACQUISITION. (4 Credits)
Historical and contemporary approaches to teaching and assessment in the second language classroom; emphasis on evaluating second language teaching methods and materials.

LING 551. GENERAL LINGUISTICS. (3 Credits)
Language systems; comparative philology; historical, descriptive, and structural linguistics; semantics; phonetics and phonemics. Not offered every year.
Recommended: 9 credits upper-division foreign language training

LING 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Management (MGMT)

MGMT 364. PROJECT MANAGEMENT. (4 Credits)
Covers the tools available to project managers, the human and organizational dimensions in different project environments, some computer applications, cases, and a project.
Prerequisites: BA 351 with C or better or BA 352 with C or better or BA 352H with C or better
Equivalent to: BA 364

MGMT 446. CROSS-CULTURAL MANAGEMENT. (4 Credits)
Provides a comprehensive understanding of cross-cultural management issues including leading culturally diverse workforces and managing diversity in the workplace. Students will not only learn theoretical foundations and best practices to address regarding global work practices, but also learn how to transfer and apply the course materials in this course to their .
Prerequisites: BA 352 with C or better or BA 352H with C or better

MGMT 448. EMPLOYEE RECRUITMENT AND SELECTION. (4 Credits)
Provide an in-depth coverage of best practices pertaining to the process of attracting, selecting, and hiring new employees in modern organizations. Topics that will be emphasized include recruitment tactics, legal issues related to staffing, the criteria organizations use to make hiring decisions, and the strengths and weaknesses of various techniques used to evaluate prospective applicants throughout the selection process. The implications of what we discuss for the organization, the hiring manager, and the job-seeker are considered.
Prerequisites: BA 352 with C or better or BA 352H with C or better

MGMT 449. COMPENSATION MANAGEMENT. (4 Credits)
Students will understand and design methods of compensation aimed at motivating and rewarding employee contributions to the organization. Employee contributions may include behavior, skills and goods/services that employees produce as individuals, teams, business units, projects or organizations. Topics include pay strategies and structures, performance measurement and evaluation, and various non-salary incentives.
Prerequisites: BA 352 with C or better

MGMT 452. LEADERSHIP. (4 Credits)
In-depth study of leadership research, theory and skills. Emphasis on analysis of organizational leadership situations and application of leadership skills in the workplace.
Prerequisites: BA 351 with C or better or BA 352 with C or better or BA 352H with C or better
Equivalent to: BA 452

MGMT 453. HUMAN RESOURCES MANAGEMENT. (4 Credits)
Personnel administration for line supervisors and managers. Integrates systems approach to understanding government regulation of employment, resolution of workplace personnel problems, and performance-based personnel management.
Prerequisites: BA 351 with C or better or BA 352 with C or better or BA 352H with C or better
Equivalent to: BA 453

MGMT 455. INFLUENCE AND NEGOTIATION. (4 Credits)
Focuses on analysis, skill development and application of management research to real-life organizational influence, persuasion, negotiation and conflict management situations.
Prerequisites: BA 352 with C or better or BA 352H with C or better
Equivalent to: BA 455

MGMT 456. MANAGEMENT FIELD PRACTICUM. (4 Credits)
An innovative application of key management principles and tools to real-life projects is provided. Students will be responsible for developing, designing, executing, and evaluating projects.
Prerequisites: MGMT 364 with C- or better or BA 364 with C- or better
Equivalent to: BA 456

MGMT 457. SUPPLY CHAIN STRATEGY. (4 Credits)
Covers tools and concepts needed to manage the supply chain effectively. Topics include negotiation, purchasing, logistics operations, and applying e-business tools. Emphasis on creating integrated supply chains.
Prerequisites: BA 357 with C- or better or BA 357H with C- or better
Equivalent to: BA 457

MGMT 459. MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (4 Credits)
Introduces students to contemporary issues managers face making ethical and socially-responsible decisions in an increasingly competitive, transparent, and global environment. Practical examples and cases, as well as contemporary behavioral ethics research and theory are incorporated throughout the course.
Prerequisites: (BA 352 with C- or better or BA 352H with C- or better)
Equivalent to: BA 354, BA 354H
MGMT 477. INTEGRATED HUMAN RESOURCE ANALYTICS PROJECT. (4 Credits)
Students will integrate what they have learned to solve industry-sponsored problems. The goal of the class is to provide students with opportunities to design, implement, and evaluate analytic solutions for a real-world enterprise. Student teams will examine the data requirements, technical requirements, and organizational requirements necessary for the success of analytical solutions. The specific goal of the class is to provide students real-world case studies that examine the role of analytics in an organization. Special emphasis will be given to the implementation and leadership of the analytical function in an enterprise.
Prerequisites: BA 474 with C- or better and BA 475 [C-]

MGMT 499. SELECTED TOPICS IN MANAGEMENT. (1-4 Credits)
Examination of the impact of recent advances in management on contemporary business. Topic will vary from term to term. This course is repeatable for 16 credits.

MGMT 548. EMPLOYEE RECRUITMENT AND SELECTION. (4 Credits)
Provides an in-depth coverage of best practices pertaining to the process of attracting, selecting, and hiring new employees in modern organizations. Topics that will be emphasized include recruitment tactics, legal issues related to staffing, the criteria organizations use to make hiring decisions, and the strengths and weaknesses of various techniques used to evaluate prospective applicants throughout the selection process. The implications of what we discuss for the organization, the hiring manager, and the job-seeker are considered.

MGMT 549. COMPENSATION MANAGEMENT. (4 Credits)
Students will understand and design methods of compensation aimed at motivating and rewarding employee contributions to the organization. Employee contributions may include behavior, skills and goods/services that employees produce as individuals, teams, business units, projects or organizations. Topics include pay strategies and structures, performance measurement and evaluation, and various non-salary incentives.

MGMT 552. ORGANIZATIONAL BEHAVIOR. (3 Credits)
Provides evidence-based study of human behavior within organizations with the goal of applying theories of human behavior to effective organizational administration. Topics include understanding individual differences, employee motivation, job design, the evaluation and motivation of employees, group dynamics and team management, effective communications, conflict management, employee stress, and work-life balance.

MGMT 553. HUMAN RESOURCES MANAGEMENT. (4 Credits)
Personnel administration for line supervisors and managers. Integrates systems approach to understanding government regulation of employment, resolution of workplace personnel problems, and performance-based personnel management.
Equivalent to: BA 553
Recommended: (BA 351 or BA 352 or BA 352H) with a minimum grade of C

MGMT 555. INFLUENCE AND NEGOTIATION. (4 Credits)
Focuses on analysis, skill development and application of management research to real life organizational influence, persuasion, negotiation and conflict management situations.
Prerequisites: BA 516 with C or better
Equivalent to: MGMT 574

MGMT 559. MANAGING ETHICS AND CORPORATE SOCIAL RESPONSIBILITY. (3 Credits)
Introduces students to contemporary issues managers face making ethical and socially-responsible decisions in an increasingly competitive, transparent, and global environment. Practical examples and cases, as well as contemporary behavioral ethics research and theory are incorporated throughout the course.
Prerequisites: MGMT 550 with C or better

MGMT 571. ETHICAL LEADERSHIP. (3 Credits)
Students will learn the theoretical paradigms of ethical conduct and decision making and consider the role of business in society.
Prerequisites: BA 550 with C or better

MGMT 572. STRATEGIC HUMAN RESOURCE MANAGEMENT. (3 Credits)
Students will learn the theories of human resource management, the legal requirements for human resource practices, and how to create an HR measurement system that aligns with an organization's strategy.
Prerequisites: BA 550 with C- or better
Recommended: BA 516 or equivalent with a minimum grade of C-

MGMT 574. NEGOTIATIONS. (3 Credits)
Students will learn the theories of negotiation and the techniques to develop an effective negotiation style.
Equivalent to: MGMT 555
Recommended: BA 516 with a minimum grade of C-

MGMT 575. INTEGRATIVE CAPSTONE I. (3 Credits)
First course in a two-course sequence spanning the final two quarters of the OLMBA program. Students will conduct an extensive analysis of the student's organization, the industry and external environment, the organization's competitors, internal organization, and business level strategy.
Prerequisites: BA 562 with B or better

MGMT 576. INTEGRATIVE CAPSTONE II. (3 Credits)
Second course in a two-course sequence spanning the final two quarters of the OLMBA program. Students start from the final proposal in MGMT 575 and formulate an integrative project plan through the application of multidisciplinary knowledge.
Prerequisites: MGMT 575 with B or better

MGMT 572. STRATEGIC HUMAN RESOURCE MANAGEMENT. (3 Credits)
Students will learn the theories of human resource management, the legal requirements for human resource practices, and how to create an HR measurement system that aligns with an organization's strategy.
Prerequisites: BA 550 with C- or better
Recommended: BA 516 or equivalent with a minimum grade of C-

MGMT 574. NEGOTIATIONS. (3 Credits)
Students will learn the theories of negotiation and the techniques to develop an effective negotiation style.
Equivalent to: MGMT 555
Recommended: BA 516 with a minimum grade of C-

MGMT 575. INTEGRATIVE CAPSTONE I. (3 Credits)
First course in a two-course sequence spanning the final two quarters of the OLMBA program. Students will conduct an extensive analysis of the student's organization, the industry and external environment, the organization's competitors, internal organization, and business level strategy.
Prerequisites: BA 562 with B or better

MGMT 576. INTEGRATIVE CAPSTONE II. (3 Credits)
Second course in a two-course sequence spanning the final two quarters of the OLMBA program. Students start from the final proposal in MGMT 575 and formulate an integrative project plan through the application of multidisciplinary knowledge.
Prerequisites: MGMT 575 with B or better

Manufacturing Engineering (MFGE)

MFGE 285. INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING. (3 Credits)
Introduction to selected topics in industrial and manufacturing engineering, including history and philosophy, product design and manufacturing cycle, integrate role of engineering and business, and multi-objective nature of organizations. Surveys of selected design problems in resource allocation, operations and quality management, and production engineering. CROSSTLISTED as IE 285/MFGE 285.
Prerequisites: IE 112 (may be taken concurrently) with C or better or FOR 112 (may be taken concurrently) with C or better
Equivalent to: IE 285
**MFGE 336. PRODUCTION ENGINEERING. (4 Credits)**
Provides a general understanding of the production engineering function within industry and the means by which to achieve tight tolerances through machining. Geometric dimensioning and tolerancing, fixture and gage design, and fundamentals of metal cutting mechanics are introduced, and their interactions are explored. Lec/lab.

**Prerequisites:** (ENGR 213 with C or better or ENGR 213H with C or better) and ENGR 248 [C] and (ENGR 321 [C] or ENGR 321H [C] or MATS 321 [C] or MATS 321H [C] and ME 250 [C])

**Equivalent to:** IE 336

**MFGE 337. MATERIALS AND MANUFACTURING PROCESSES. (4 Credits)**
Introduces mechanical manufacturing methods by which materials are economically shaped into valuable products. The overall goal is to develop an understanding of how the functionality, shape, materials, cost and sustainability of a product influence manufacturing process selection and design. Lec/lab.

**Prerequisites:** (ENGR 321 with C or better or ENGR 321H with C or better or MATS 321 with C or better or MATS 321H with C or better) and ME 250 [C] and MFGE 336 [C])

**Equivalent to:** IE 337

**MFGE 436. LEAN MANUFACTURING SYSTEMS ENGINEERING. (4 Credits)**
The planning, evaluation, deployment, and integration of lean manufacturing theory and methods. Examines manufacturing processes/equipment and systems, e.g., planning/control, product design, supply chain resource management. Lec/lab.

**Prerequisites:** ENGR 390 with C or better or ENGR 391 with C or better

**Equivalent to:** IE 436

**MFGE 437. COMPUTER CONTROL OF MANUFACTURING PROCESSES. (4 Credits)**
Introduces fundamental knowledge in the automation of manufacturing systems and processes. Automated manufacturing system design and operations--computer numerical control (CNC) technology; NC part programming; sensors and actuators, their modeling and dynamic simulation; feedback motion delivery systems design and tuning; programmable logic controls (PLC) for industrial control systems, and path planning for numerical controlled (NC) machinery. Lec/lab.

**Prerequisites:** (ME 317 with C or better or ME 317H with C or better or MFGE 336 with C or better) and (ENGR 212 [C] or ENGR 212H [C])

**Equivalent to:** IE 437

**MFGE 438. COMPOSITES MANUFACTURING. (4 Credits)**
Introduction to fiber-reinforced composite materials and their applications. Topics include matrices and reinforcement; open and closed molding processes; filament winding, quality, testing, damage assessment; basics of factory operations and sustainability of composites. Students will complete laboratory projects using fiber-reinforced laminates. Lec/lab.

**Prerequisites:** ENGR 213 with C or better or ENGR 213H with C or better

**MFGE 499. SPECIAL TOPICS. (0-5 Credits)**
This course is repeatable for 99 credits.

**MFGE 507. SEMINAR. (1-16 Credits)**
Graded P/N.

**This course is repeatable for 16 credits.**
Marketing (MRKT)

MRKT 323. ADVANCED APPLICATION OF MARKETING PRINCIPLES. (4 Credits)
Develop an understanding of how a market-orientation can help firms to profitably deliver value to targeted customers. Through a combination of case discussions, preparation of a client project, lectures and in-class activities, analyze complex marketing challenges; make strategic decisions for products, services, and brands, based on marketing principles; and persuasively communicate decisions.

Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better
Equivalent to: MRKT 390

MRKT 390. BUILDING AND MANAGING PRODUCTS, SERVICES, AND BRANDS. (4 Credits)
Covers concepts and principles used by marketing professionals. Designed explicitly for Marketing majors, it is an introduction to the relationships between customers, products, and companies in a competitive and dynamically evolving marketplace.

Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better

MRKT 396. FUNDAMENTALS OF MARKETING RESEARCH. (4 Credits)
Introduction to the fundamentals of market research. Provides a basic understanding of marketing research and relevant decisions in the process.

Prerequisites: (BA 275 with C- or better or BA 275H with C- or better or BA 276 with C- or better or ST 202 with C- or better) and (BA 223 [C] or BA 223H [C] or BA 390 [C] or BA 390H [C])
Equivalent to: BA 396

MRKT 477. INTEGRATED MARKETING ANALYTICS PROJECT. (4 Credits)
Students will integrate what they have learned to solve industry-sponsored problems. The goal of the class is to provide students with opportunities to design, implement, and evaluate analytic solutions for a real-world enterprise. Student teams will examine the data requirements, technical requirements, and organizational requirements necessary for the success of analytical solutions. The specific goal of the class is to provide students real-world case studies that examine the role of analytics in an organization. Special emphasis will be given to the implementation and leadership of the analytical function in an enterprise.

Prerequisites: BA 474 with C- or better and BA 475 [C-

MRKT 484. DIGITAL MEDIA AND MARKETING INTEGRATION. (4 Credits)
Digital media is a necessary component of marketing in today's businesses and non-profit organizations. The digital media industry is changing rapidly and transforming the way businesses connect and communicate with their customers. The number of digital marketing platforms, their strengths, weaknesses, and diversity of delivery make digital marketing an exciting opportunity. This course examines the major digital channels and platforms, implementation considerations, and the associated risks and limitations.

Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
MRKT 485. SEARCH ENGINE MARKETING. (4 Credits)
Online visibility is driven by the effectiveness of an organization's Search Engine Optimization (SEO) and Search Engine Marketing (SEM). Search Marketing teaches the fundamentals of SEO and SEM and how they can be integrated into an overall marketing strategy to maximize brand visibility and performance.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 486

MRKT 486. CUSTOMER RELATIONSHIP MANAGEMENT. (4 Credits)
An integration of people, process and technology. Students will learn how individuals and companies can gain the return on investment that they expect through technology implementation, service and business process mapping, employee training, customer relationship, customer lifecycle time value, technology solutions that track customer data and employee performance.
Prerequisites: BA 396 with C- or better or MRKT 396 with C- or better
Equivalent to: BA 487

MRKT 488. PERSONAL SELLING. (4 Credits)
An introductory course that focuses on two areas: the principles and theory of personal selling, and on understanding and developing the interpersonal communication skills needed for successful personal selling.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 491

MRKT 489. PERSONAL SELLING SKILLS AND TECHNIQUES. (4 Credits)
Learn and develop the skills necessary for persuasive encounters in personal selling settings, such as making sales calls, preparing and delivering presentations, writing documents (sales proposals, cover letters, and resumes) and structuring logical, persuasive, prioritized arguments.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 489

MRKT 491. QUALITATIVE RESEARCH METHODS. (4 Credits)
Students will gain an overall understanding of qualitative research and methods such as focus groups, in-depth interviews, and observational research. Explores qualitative research methods through hands-on learning and experiences.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 492

MRKT 492. CONSUMER BEHAVIOR. (4 Credits)
Understanding the processes that lead to purchase, so as to improve decisions on segmentation and the appropriate marketing mix for each segment. How consumers and households make decisions, and why different individuals/groups make different decisions. Application of behavioral science concepts at individual, subcultural and cultural levels. Effects of consumerism and regulation also are considered.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 492

MRKT 493. INTEGRATED MARKETING COMMUNICATIONS. (4 Credits)
Analysis of the influence of marketing communications on the attitudes and behaviors of consumer and industrial buyers. Identification and examination of the major decisions made by marketing/advertising managers in implementing the promotional mix.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 493

MRKT 495. RETAIL MANAGEMENT. (4 Credits)
Management of retail business with emphasis on strategic planning, analysis, and control, focused on middle- and upper-middle management decisions.
Prerequisites: BA 390 with C- or better or BA 390H with C- or better or BA 223 with C- or better or BA 223H with C- or better
Equivalent to: BA 495

MRKT 496. MARKETING RESEARCH PRACTICUM. (4 Credits)
Provides the student with practical experience in the collection, analysis and interpretation of primary data.
Prerequisites: MRKT 396 with C or better or BA 396 with C or better
Equivalent to: BA 496

MRKT 497. GLOBAL MARKETING. (4 Credits)
Consideration of cultural, political, regulatory, economic and trade barriers in the design of marketing plans for product development, pricing, channels of distribution; and promotion alternatives in a global market.
Prerequisites: (BA 347 with C- or better or BA 347H with C- or better) and (BA 390 [C-] or BA 390H [C-] or BA 223 [C-] or BA 223H [C-])
Equivalent to: BA 497

MRKT 498. SERVICES MARKETING. (4 Credits)
Formulation of strategic and tactical marketing plans for organizations (both profit and not-for-profit) in the service sector of the economy. Projects or cases are used to provide a comprehensive experience.
Prerequisites: BA 223 with C or better or BA 223H with C or better or BA 390 with C or better or BA 390H with C or better or MRKT 390 with C or better
Equivalent to: BA 498

MRKT 499. MARKETING STRATEGY. (4 Credits)
Market and competitive analysis for developing overall strategies and tactics to achieve the marketing objectives of the business enterprise. Projects or cases are used to provide a comprehensive experience.
Prerequisites: MRKT 396 with C or better or BA 396 with C or better
Equivalent to: BA 499

MRKT 581. APPLIED QUANTITATIVE MARKETING ANALYSIS. (4 Credits)
Includes a comprehensive presentation of quantitative methods used in marketing management. It is designed to prepare students to use quantitative techniques in making marketing decisions. Topics include ANOVA, regression, discriminant and logit analysis, factor analysis, cluster analysis, and structural equation modeling.
Prerequisites: BA 596 with C or better or MRKT 596 with C or better

MRKT 582. APPLIED QUALITATIVE MARKETING ANALYSIS. (3 Credits)
Explores the uses and application of qualitative research methods to inform and improve marketing decision-making. Students will be introduced to such methods as focus group interviews, individual in-depth interviews, observational research methods, participant observation, and ethnographic immersion. Students will learn appropriate analytic strategies and reporting methodologies.
Prerequisites: BA 596 with C or better or MRKT 596 with C or better
Recommended:

MRKT 584. DIGITAL MEDIA AND MARKETING INTEGRATION. (4 Credits) Digital media is a necessary component of marketing in today’s businesses and non-profit organizations. The digital media industry is changing rapidly and transforming the way businesses connect and communicate with their customers. The number of digital marketing platforms, their strengths, weaknesses, and diversity of delivery make digital marketing an exciting opportunity. This course examines the major digital channels and platforms, implementation considerations, and the associated risks and limitations.
Prerequisites: BA 516 with B- or better

MRKT 585. SEARCH ENGINE MARKETING. (4 Credits) Online visibility is driven by the effectiveness of an organization’s Search Engine Optimization (SEO) and Search Engine Marketing (SEM). Search Marketing teaches the fundamentals of SEO and SEM and how they can be integrated into an overall marketing strategy to maximize brand visibility and performance.
Prerequisites: BA 516 with B- or better

MRKT 586. CUSTOMER RELATIONSHIP MANAGEMENT. (4 Credits) An integration of people, process and technology. Students will learn how individuals and companies can gain the return on investment that they expect through technology implementation, service and business process mapping, employee training, customer relationship, customer lifetime value, technology solutions that track customer data and employee performance.
Prerequisites: BA 516 with B- or better
Recommended: MRKT 396 with a minimum grade of C-

MRKT 587. DESIGNING CUSTOMER EXPERIENCES. (3 Credits) Allows students to explore the process of designing customer experiences in ways that allow firms to successfully deliver value in a complex, dynamic competitive environment. Building on knowledge developed through collaboration, generation of customer insights, and mapping exercises, students will work in teams to design a customer experience for an industry client. Lec/studio.
Prerequisites: BA 590 with B- or better and MRKT 592 [B-]

MRKT 588. PERSONAL SELLING. (4 Credits) An introductory course that focuses on two areas: the principles and theory of personal selling, and on understanding and developing the interpersonal communication skills needed for successful personal selling.

MRKT 589. PERSONAL SELLING SKILLS DEVELOPMENT. (4 Credits) Learn and develop the skills necessary for persuasive encounters in personal selling settings, such as making sales calls, preparing and delivering presentations, writing documents (sales proposals, cover letters, and resumes) and structuring logical, persuasive, prioritized arguments.
Recommended: BA 491 or MRKT 488 with a minimum grade of C-

MRKT 592. CONSUMER BEHAVIOR. (3 Credits) Understanding the processes that lead to purchase, so as to improve decisions on segmentation and the appropriate marketing mix for each segment. How consumers and households make decisions, and why different individuals/groups make different decisions. Application of behavioral science concepts at individual, subcultural and cultural levels. Effects of consumerism and regulation also are considered.
Prerequisites: BA 516 with B- or better
Equivalent to: BA 592

MRKT 593. INTEGRATED MARKETING COMMUNICATIONS. (3 Credits) Analysis of the influence of marketing communications on the attitudes and behaviors of consumer and industrial buyers. Identification and examination of the major decisions made by marketing/advertising managers in implementing the promotional mix.
Prerequisites: BA 516 with B- or better
Equivalent to: BA 593

MRKT 595. RETAIL MANAGEMENT. (4 Credits) Management of retail business with emphasis on strategic planning, analysis, and control, focused on middle- and upper-management decisions.
Equivalent to: BA 595
Recommended: (BA 390 or BA 390H or BA 590) with a minimum grade of C-

MRKT 596. MARKETING RESEARCH DESIGN AND METHODS. (3 Credits) Focuses on articulating research problems, creating appropriate research design to address information needs (i.e., understanding markets, competitors, and customers), ethics (to include IRB training), and the application of diverse data collection methods, including secondary, qualitative, and quantitative methods. Measurement, sampling, and data preparation will also be addressed.
Equivalent to: BA 596
Recommended: BA 390

MRKT 597. GLOBAL MARKETING. (4 Credits) Consideration of cultural, political, regulatory, economic and trade barriers in the design of marketing plans for product development, pricing, channels of distribution; and promotion alternatives in a global market.
Equivalent to: BA 597
Recommended: BA 347 and (BA 390 or BA 390H or BA 590) with a minimum grade of C-

MRKT 599. SELECTED TOPICS IN MARKETING. (1-4 Credits) Concepts and methods in advanced marketing management practice. Latest theoretical developments and quantitative methods in marketing, with particular relevance to managerial applications. Topics will vary from term to term.
Equivalent to: BA 599
This course is repeatable for 16 credits.

MRKT 690. MARKETING AND COMMERCIALIZATION. (3 Credits) Surveys marketing research related to innovation. Specific topics may change from quarter to quarter, but sample topics include research on marketing strategy, consumer behavior, brand equity, brand management, and product management, each from the perspective of the consumer and the firm.

Master of Natural Resources (MNR)

MNR 500. MARKET TOOLS FOR MANAGING GREENHOUSE GAS EMISSIONS. (3 Credits) Examines the use of market-based approaches to managing greenhouse gas emissions; the role of forestry and natural resource management in mitigating greenhouse gas emissions; and the design of carbon and offset markets in the context of broader climate change policies. Crosslisted as FES 500/MNR 500.
Equivalent to: FES 500
Recommended: MTH 111
MNR 511. INTRODUCTION TO SUSTAINABLE NATURAL RESOURCES. (3 Credits)
Overview of economic, environmental, social, cultural, ethical, and policy considerations of sustainable natural resource management. International collaborative efforts to address global natural resource issues. Key policy drivers, key stressors, balancing competing interests. Introductory course required for all Master of Natural Resources students; open to other graduate students. Taught via Ecampus only.
Recommended: Undergraduate biology or ecology course

MNR 522. RESEARCH METHODS SOCIAL SCIENCE. (4 Credits)
An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results.
Lec/lab.
Equivalent to: FES 522
Recommended: Upper-division or graduate level statistics

MNR 530. TROPICAL FOREST ECOLOGY AND MANAGEMENT: A GLOBAL PERSPECTIVE. (3 Credits)
Study of tropical forest ecology and the common ecological patterns found within tropical forests. The threats and challenges that tropical forests face in the 21st century and the issues of human use and their impacts. Developing strategies for sustainable management and restoration approaches to alleviate pressure on remaining tropical forests. Taught via Ecampus only.

MNR 538. ADAPTING FORESTS TO CLIMATE CHANGE. (3 Credits)
Climate change is expected to have profound effects on forests. Society can respond by managing in forests in ways that can help mitigate climate change or help forests adapt. Nonetheless, changes in climate and forest responses are uncertain, making management and policy decisions difficult and controversial. We will investigate the effects of climate change on forests, focusing on potential forest management and policy responses.

MNR 550. CLIMATE CHANGE IMPACTS ON FOREST ECOSYSTEMS. (3 Credits)
Forest management responses to climate change will rely on understanding the mechanisms of interaction between forests and climate, as well as the capacity to evaluate impacts of future climate scenarios on forests. This course will consider effects of rising CO2 and changing climate at the level of ecophysiological processes, changes in species distribution, changes in disturbance regimes, and ecosystem-level impacts mediated by the water, carbon, and nitrogen cycles. Modeling approaches will include statistically-based bioclimatic envelopes, and dynamic global vegetation models that treat ecosystem processes and changes in biome distribution.
Recommended: Basic ecology course. FCSJ Graduate Certificate students should take SNR 511 in their first term

MNR 560. MASTER'S CASE STUDY. (3 Credits)
Capstone project integrating course work, readings, and assignments to address complex natural resource problems of local or regional importance. Taught via Ecampus only. Graded P/N.
Prerequisites: MNR 511 with C or better

MNR 561. MNR CAPSTONE PROJECT. (1-6 Credits)
Students work with their major advisor on the completion of their capstone project at the end of the MNR degree program. Students incorporate knowledge gained from coursework to address a natural resource problem within interconnected ecological, economic and social contexts. This course is repeatable for 12 credits.
Recommended: MNR 560 or (SNR 511 and SNR 506)

Master of Public Policy (MPP)

MPP 507. SEMINAR. (1-16 Credits)
Selected issues concerning government, public policy, public affairs or non-profit organizations.
This course is repeatable for 16 credits.

MPP 510. INTERNSHIP. (1-16 Credits)
Supervised work experience in government, public policy, public affairs or non-profit organizations. Reports and appraisals required. Graded P/N.
This course is repeatable for 16 credits.

MPP 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 32 credits.

Materials Science (MATS)

MATS 221. THE SCIENCE, ENGINEERING AND SOCIAL IMPACT OF NANOTECHNOLOGY. (3 Credits)
Nanotechnology is an emerging engineering field that manipulates atoms and molecules to fabricate new materials and tiny devices. Properties of nanostructured materials, manufacturing methods, characterization methods, and impact on health and safety. Benefits and concerns about nanotechnology will be assessed. Lec/rec. CROSSLISTED as ENG 221/ MATS 221.
Equivalent to: ENGR 221
Recommended: One year of college science.

MATS 321. INTRODUCTION TO MATERIALS SCIENCE. (4 Credits)
Crystal structure, microstructure, and physical properties of metals, ceramics, polymers, composites, and amorphous materials. Also includes elementary mechanical behavior and phase equilibria.
Prerequisites: CH 202 with C or better or CH 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 224H with C or better
Equivalent to: ENGR 321, ENGR 321H, MATS 321H

MATS 321H. INTRODUCTION TO MATERIALS SCIENCE. (4 Credits)
Crystal structure, microstructure, and physical properties of metals, ceramics, polymers, composites, and amorphous materials. Also includes elementary mechanical behavior and phase equilibria.
Attributes: HNRS – Honors Course Designator
Prerequisites: CH 202 with C or better or CH 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 224H with C or better
Equivalent to: ENGR 321, ENGR 321H, MATS 321

MATS 322. MECHANICAL PROPERTIES OF MATERIALS. (3 Credits)
Mechanical behavior of materials, relating laboratory test results to material structure, and elements of mechanical analysis.
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (ENGR 321 [C] or ENGR 321H [C] or MATS 321 [C])
Equivalent to: ENGR 322

MATS 413. THERMODYNAMICS AND PHASE EQUILIBRIA OF MATERIALS. (4 Credits)
Explores the statistical interpretation of entropy, heat capacity, enthalpy of condensed phases, solution thermodynamics, liquid-solid and solid-solid phase equilibria. Considers the principles of thermodynamics governing phase stability with a focus on liquid-solid and solid-solid equilibria, and phase stability in two-component systems. Examines the relationship of Gibbs free energy to phase stability.
Prerequisites: MATS 321 with C or better and (ME 311 [C] or NSE 311 [C] or CHE 311 [C])
MATS 445. WELDING METALLURGY. (4 Credits)
Theory-based course focused on the metallurgy of welds. Topics covered include welding/joining processes, heat input, diffusion, solidification, phase transformation, materials compatibility and welding defects. This is NOT a practical welding class.
Prerequisites: (MATS 321 with C or better or ENGR 321 with C or better or ENGR 321H with C or better) or MATS 570 with C or better
Equivalent to: ME 455
This course is repeatable for 8 credits.
Recommended: ME 570

MATS 570. STRUCTURE-PROPERTY RELATIONS IN MATERIALS. (4 Credits)
Equivalent to: ME 570

MATS 571. ELECTRONIC PROPERTIES OF MATERIALS. (4 Credits)
Equivalent to: ME 571
Recommended: CH 545 or ME 570

MATS 578. THIN FILM MATERIALS CHARACTERIZATION AND PROPERTIES. (4 Credits)
Processing of thin films and characterization of the microstructure; diffusion and solid state reactions; mechanical, magnetic and electronic properties of thin films.
Equivalent to: ME 578

MATS 581. THERMODYNAMICS OF SOLIDS. (4 Credits)
Equivalent to: ME 581

MATS 582. RATE PROCESSES IN MATERIALS. (3 Credits)
Diffusion in solids, including vacancy and interstitial and short-circuit diffusion. Phase transformations including classic nucleation and growth theory. Applications to materials development.
Equivalent to: ME 582

MATS 584. ADVANCED FRACTURE OF MATERIALS. (4 Credits)
Fracture mechanics will be used as a basis for predicting failure of materials, understanding failure mechanisms, and identifying causes of failure. Course will include discussion of recent journal articles, experimental demonstrations, and analysis of real fracture data.
Equivalent to: ME 584
Recommended: ENGR 322

MATS 587. DISLOCATIONS, DEFORMATION, AND CREEP. (4 Credits)
The effects of point, line, and planar defects on plastic deformation and creep behavior in solids will be discussed with emphasis on the role of dislocations and vacancies.
Equivalent to: ME 587
Recommended: ENGR 322

MATS 588. COMPUTATIONAL METHODS IN MATERIALS SCIENCE. (4 Credits)
A broad introduction to important materials science simulation methods. These include molecular dynamics, density functional theory, and Monte Carlo methods. Learning is through a mixture of lecture and hands-on lab projects in which students use computational methods to explore and reinforce fundamental concepts in materials science. Lec/lab.
Equivalent to: ME 588
Recommended: Experience with Matlab or Mathematica or an equivalent numerical and programming environment.

MATS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
MATS 659. PRINCIPLES OF TRANSMISSION ELECTRON MICROSCOPY. (4 Credits)
This lecture-only course covers basic principles of transmission electron microscopy (TEM) including instrument components, electron optics, electron diffraction, and the origins and interpretation of image contrast. Spectroscopic techniques are covered, but diffraction and imaging techniques are emphasized. Coverage of experimental techniques will focus on those useful for addressing problems in materials science.
Recommended: MATS 570 and (CH 616 or MATS 555)

MATS 671. ELECTRONIC PROPERTIES OF OXIDES. (4 Credits)
Band theory of solids applied to metal oxide materials. Includes metallic oxides, non-stoichiometric semiconductors and associated defect chemistry, high temperature superconductors, electrostatics, linear dielectrics, non-linear dielectrics, piezoelectrics, and the optical properties of oxides.
Equivalent to: ME 671
Recommended: ME 571 or MATS 571 or PH 575

Mathematics (MTH)

MTH 065. ELEMENTARY ALGEBRA. (3 Credits)
Arithmetic of signed numbers, order of operations, simplifying algebraic expressions, solutions of linear equations, and inequalities. Rules of exponents, addition, subtraction, and multiplication of polynomials, factoring, solution of quadratic equations by factoring, reducing rational expressions. Word problems involving linear equations, graphing of linear equations, inequalities. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: Math Placement Test with a score of 05 or Math Placement Test - ALEKS with a score of 015

MTH 095. INTERMEDIATE ALGEBRA. (3 Credits)
Addition, subtraction, multiplication, and division of rational expressions, long division of polynomials, solutions of fractional equations, applications involving linear equations. Fractional equations, inequalities, literal equations, and variations. Negative and fractional exponents, radicals, solutions of quadratic equations, and complex numbers. Cartesian coordinates, graphs of linear equations and inequalities, distance formula, slope, equations of lines, solutions of systems of linear equations in two unknowns and inequalities. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 065 with C- or better or Math Placement Test with a score of 11 or Math Placement Test - ALEKS with a score of 030

MTH 102. ALGEBRAIC FOUNDATIONS. (3 Credits)
This course is designed primarily for EOP students. They will use various computing technologies to explore realistic and interesting situations in which algebra is used. As they work through explorations, they will work with many of the fundamental ideas of algebra, ideas they will find important in their daily lives.

MTH 103. ALGEBRAIC REASONING. (4 Credits)
Graphing data, functions, rate of change, linear equations, systems of linear equations, linear inequalities, linear functions, absolute value functions, quadratic functions, exponential functions. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 065 with C- or better or Math Placement Test with a score of 11 or Math Placement Test - ALEKS with a score of 030

MTH 105. *INTRODUCTION TO CONTEMPORARY MATHEMATICS. (3 Credits)
Elementary linear programming, combinatorics, descriptive statistics, elementary probability, exponential growth and decay, examples of major mathematical ideas and models. Lec/rec. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Recommended: MTH 095 or MTH 103 or (MPT=Math Placement Test score of 17; MPAL=Math Placement Test-ALEKS score of 46%)

MTH 111. *COLLEGE ALGEBRA. (4 Credits)
Polynomial equations and inequalities, polynomial functions and graphs, inverse functions, exponential and logarithmic functions, elementary mathematical modeling and applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with a C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 095 with C- or better or MTH 103 with C- or better or Math Placement Test with a score of 17 or Math Placement Test - ALEKS with a score of 046

MTH 112. *ELEMENTARY FUNCTIONS. (4 Credits)
Triangle trigonometry, circular functions and graphs, trigonometric equations and identities, inverse trigonometric functions, polar coordinates, vectors and applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement Test - ALEKS with a score of 060
Equivalent to: MTH 150X

MTH 199. SPECIAL TOPICS. (1-16 Credits)
Maximum 3 credits per term, 9 credits total. Does not meet university group requirement in physical science.
This course is repeatable for 9 credits.

MTH 211. *FOUNDATIONS OF ELEMENTARY MATHEMATICS. (4 Credits)
Introduction to problem solving, sets, whole numbers, number theory, fractions. Intended primarily for prospective elementary teachers. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 095 with C- or better or MTH 103 with C- or better or MTH 111 with C- or better or MTH 112 with C- or better or Math Placement Test with a score of 17 or Math Placement Test - ALEKS with a score of 046

MTH 212. FOUNDATIONS OF ELEMENTARY MATHEMATICS. (4 Credits)
Math 212 is the second of a three-term sequence of courses designed to help prepare prospective elementary and middle school teachers. Topics covered include fractions, decimals, percent, ratio and proportion, integers, rational numbers, real numbers, probability and statistics.
Prerequisites: MTH 211 with C- or better
MTH 227. *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I. (4 Credits)
Review of exponential and trigonometric functions, including examples of exponential and periodic behavior; discrete probability; examples of biologically motivated difference equations; differentiation of polynomials, exponential and trigonometric functions with applications to optimization. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 112 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 75
Equivalent to: MTH 227X

MTH 228. CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II. (4 Credits)
Continuation of MTH 227 with more general population growth models. Antidifferentiation; The Fundamental Theorem of Calculus applied to solving continuous growth models. Continuous random variables. Basic linear algebra of small systems sufficient to calculate eigenvalues and eigenvectors and appreciate their use in life science applications. Lec/rec.
Prerequisites: MTH 227 with C- or better or MTH 227X with C- or better

MTH 231. ELEMENTS OF DISCRETE MATHEMATICS. (4 Credits)
Elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: MTH 231H

MTH 231H. ELEMENTS OF DISCRETE MATHEMATICS. (4 Credits)
Elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060
Equivalent to: MTH 231

MTH 241. *CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE. (4 Credits)
Elementary differential calculus of polynomial, logarithmic, and exponential functions and their applications to business, management and social sciences. Lec/rec. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060

MTH 245. *MATHEMATICS FOR MANAGEMENT, LIFE, AND SOCIAL SCIENCES. (4 Credits)
Techniques of counting, probability and elements of statistics including binomial and normal distributions. Introductory matrix algebra. Elements of linear programming. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 111 with C- or better or Math Placement Test with a score of 24 or Math Placement - ALEKS with a score of 060

MTH 251. *DIFFERENTIAL CALCULUS. (4 Credits)
Differential calculus for engineers and scientists. Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math
Prerequisites: MTH 112 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 075
Equivalent to: MTH 251H

MTH 251H. *DIFFERENTIAL CALCULUS. (4 Credits)
Differential calculus for engineers and scientists. Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Bacc Core Course)
Attributes: CSMA – Core, Skills, Math; HNRS – Honors Course Designator
Prerequisites: MTH 112 with C- or better or MTH 150X with C- or better or Math Placement Test with a score of 33 or Math Placement - ALEKS with a score of 075
Equivalent to: MTH 251

MTH 252. INTEGRAL CALCULUS. (4 Credits)
Definite integrals, elementary applications to area, force, and work. Integral tables and basic techniques of integration, calculus of logarithmic and exponential functions, polar coordinates, applications to areas, volumes, force, work, and growth and decay problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 251 with C- or better or MTH 251H with C- or better
Equivalent to: MTH 252H

MTH 252H. INTEGRAL CALCULUS. (4 Credits)
Definite integrals, elementary applications to area, force, and work. Integral tables and basic techniques of integration, calculus of logarithmic and exponential functions, polar coordinates, applications to areas, volumes, force, work, and growth and decay problems. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 251 with C- or better or MTH 251H with C- or better
Equivalent to: MTH 252

MTH 253. INFINITE SERIES AND SEQUENCES. (4 Credits)
Indeterminate forms. Improper integrals. Sequences and series, especially Taylor's formula and power series. Applications to numerical estimation with error analysis. Series with complex terms and the Euler identities. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 253H

MTH 254. VECTOR CALCULUS I. (4 Credits)
Vectors, vector functions, and curves in two and three dimensions. Surfaces, partial derivatives, gradients, and directional derivatives. Multiple integrals in rectangular, polar, cylindrical, and spherical coordinates. Physical and geometric applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 254H
MTH 254H. VECTOR CALCULUS I. (4 Credits)
Vectors, vector functions, and curves in two and three dimensions. Surfaces, partial derivatives, gradients, and directional derivatives. Multiple integrals in rectangular, polar, cylindrical, and spherical coordinates. Physical and geometric applications. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 254

MTH 255. VECTOR CALCULUS II. (4 Credits)
Brief review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss and Stokes with applications to force, work, mass, and charge. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 255H

MTH 255H. VECTOR CALCULUS II. (4 Credits)
Brief review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss and Stokes with applications to force, work, mass, and charge. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 255H

MTH 256. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler's identities is highly desirable.) Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256

MTH 256H. APPLIED DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler's identities is highly desirable.) All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 256H

MTH 305. INTRODUCTION TO SERIES. (2 Credits)
Convergence and divergence of numerical series, including geometric series. Series of functions. Power series and their analytic properties. Taylor series expansions and Taylor polynomials.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better

MTH 305H. INTRODUCTION TO SERIES. (2 Credits)
Convergence and divergence of numerical series, including geometric series. Series of functions. Power series and their analytic properties. Taylor series expansions and Taylor polynomials.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 255

MTH 298. INTRODUCTORY DIFFERENTIAL EQUATIONS. (4 Credits)
First order linear and nonlinear equations, and second order linear equations. Applications to electric circuits and mechanical oscillators. Introduction to the Laplace transform and higher order equations. Solution methods and applications appropriate for science and engineering. (Familiarity with complex numbers and Euler's identities is highly desirable.) Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
Equivalent to: MTH 298

MTH 306. MATRIX AND POWER SERIES METHODS. (4 Credits)
Introduction to matrix algebra, determinants, systematic solution to linear systems, and eigenvalue problems. Convergence and divergence of series with emphasis on power series, Taylor series expansions, convergence tests for power series, and error estimates for truncated series used in practical approximations. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 306

MTH 299. SPECIAL TOPICS. (0-16 Credits)
Maximum 3 credits per term, 9 credits total. This course is repeatable for 9 credits.

MTH 306H. MATRIX AND POWER SERIES METHODS. (4 Credits)
Introduction to matrix algebra, determinants, systematic solution to linear systems, and eigenvalue problems. Convergence and divergence of series with emphasis on power series, Taylor series expansions, convergence tests for power series, and error estimates for truncated series used in practical approximations. Lec/rec. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Attributes: HNRS – Honors Course Designator
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better
Equivalent to: MTH 306H

MTH 311. ADVANCED CALCULUS. (4 Credits)
Rigorous development of calculus, axiomatic properties of R, topology of the real line, convergence of sequences and series of real numbers, functions, limits of functions, basic properties of continuity and derivatives. Brief treatment of Riemann integration, improper integrals, sequences of functions, pointwise and uniform convergence, introductory aspects of multivariable calculus. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
and MTH 355 [C-]

MTH 312. ADVANCED CALCULUS. (4 Credits)
Rigorous development of calculus, axiomatic properties of R, topology of the real line, convergence of sequences and series of real numbers, functions, limits of functions, basic properties of continuity and derivatives. Brief treatment of Riemann integration, improper integrals, sequences of functions, pointwise and uniform convergence, introductory aspects of multivariable calculus. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better
and MTH 355 [C-]
MTH 321. INTRODUCTORY APPLICATIONS OF MATHEMATICAL SOFTWARE. (3 Credits)
An introduction to select mathematical software packages to support problem solving and applications. Topics include using computational resources to solve basic numerical and symbolic problems in mathematics, visualization and presentation of data, creation of simple programming scripts, and applications of basic programming techniques to promote mathematical understanding. The scientific typesetting language LaTeX will also be covered. All courses used to satisfy MTH prerequisites must be completed with a C- or better.
Prerequisites: MTH 341 with C- or better or (MTH 264 with C- or better or MTH 264H with C- or better) or (MTH 306 with C- or better or MTH 306H with C- or better)

MTH 323. *MATHEMATICAL MODELING. (3 Credits)
A variety of mathematical modeling techniques will be introduced. Students will formulate models in response to practical problems drawn from the literature of ecology, environmental sciences, engineering or other fields. Informal writing assignments in class and formal written presentation of the models will be required. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]

MTH 333. *FUNDAMENTAL CONCEPTS OF TOPOLOGY. (3 Credits)
Open and closed sets, continuity, compactness, connectedness, winding number, fixed point theorems in the plane. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MTH 341 with C- or better or MTH 355 with C- or better

MTH 338. *NON-EUCLIDEAN GEOMETRY. (3 Credits)
Introduction to non-Euclidean geometries. Selected topics such as hyperbolic and elliptic geometry, spherical geometry, projective geometry, geometries arising from alternative metrics. All courses used to satisfy MTH prerequisites must be completed with C- or better. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MTH 252 with C- or better or MTH 252H with C- or better

MTH 341. LINEAR ALGEBRA I. (3 Credits)
Matrix algebra, determinants, systems of linear equations, subspaces, an introductory study of eigenvalues and eigenvectors. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 254 with C- or better or MTH 254H with C- or better

MTH 342. LINEAR ALGEBRA II. (4 Credits)
Abstract (real or complex) vector spaces, linear transformations, inner product spaces, orthogonality, eigenspaces and diagonalization, spectral theorems, singular value decomposition. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 341 with C- or better

MTH 343. INTRODUCTION TO MODERN ALGEBRA. (3 Credits)
Introduction to rings and fields with an emphasis on the integers and polynomial rings; selected applications. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 341 with C- or better and MTH 355 [C-]

MTH 351. INTRODUCTION TO NUMERICAL ANALYSIS. (3 Credits)
Introduction to the computation of approximate solutions to mathematical problems that cannot be solved by hand: analysis of errors; rootfinding for nonlinear equations in one variable; interpolation of functions; numerical integration. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 253 with C- or better or (MTH 306 with C- or better or MTH 306H with C- or better) and (MTH 264 with C- or better or MTH 264H with C- or better) and (MTH 265 [C-] or MTH 265H [C-])
Recommended: Programming experience

MTH 355. DISCRETE MATHEMATICS. (3 Credits)
Proof analysis and development in the context of discrete mathematics for math majors transitioning to upper-division course work. Topics include elementary logic and set theory, quantifiers, basic counting principles, elementary combinatorics, equivalence relations, the binomial theorem, and mathematical induction. Additional topics may include recurrence relations, generating functions, and introductory graph theory. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 253 with C- or better
Recommended: MTH 341

MTH 361. INTRODUCTION TO PROBABILITY. (3 Credits)
Probability problem solving using concepts developed in calculus. Topics include probability models, discrete and continuous random variables, expectation and variance, the law of large numbers, and the central limit theorem. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 253 with C- or better or (MTH 306 with C- or better or MTH 306H with C- or better) or (MTH 265 with C- or better or MTH 265H with C- or better)
Equivalent to: MTH 361H

MTH 390. FOUNDATIONS OF ELEMENTARY MATHEMATICS. (4 Credits)
Math 390 is the third of a three-term sequence of classes designed to help prepare prospective elementary and middle school teachers. Topics covered include informal geometry, measurement, congruence, similarity, coordinate and transformational geometry.
Prerequisites: MTH 211 with C- or better and MTH 212 [C-]
Equivalent to: MTH 213

MTH 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: MTH 399H
This course is repeatable for 16 credits.

MTH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: MTH 399
This course is repeatable for 16 credits.

MTH 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 406. PROJECTS. (1-3 Credits)
Graded P/N.
This course is repeatable for 16 credits.

MTH 407. SEMINAR. (3 Credits)
This course is repeatable for 99 credits.
MTH 410. OCCUPATIONAL INTERNSHIP. (3-12 Credits)
Planned and supervised training experience at selected government, industrial, or business placement sites. Must be followed by a one-hour post-internship seminar. Consult departmental head advisor. Graded P/N. This course is repeatable for 16 credits.

MTH 411. REAL ANALYSIS. (3 Credits)
Properties of metric spaces and normed spaces, including $l_p$ spaces. Completeness and applications, including fixed point theorems. Compactness. Equicontinuity and the Arzela-Ascoli theorem. Uniform continuity and uniform convergence, including applications. 
Prerequisites: MTH 312 with B+ or better and MTH 341 [B+]
This course is repeatable for 18 credits.

MTH 412. REAL ANALYSIS. (3 Credits)
Measure and integration theory, basic convergence theorems, Lebesgue spaces,  Fubini's theorem, Radon-Nikodym theorem, and applications. Banach spaces including  Baire category theorems, and Hilbert spaces. 
Prerequisites: MTH 411 with C- or better or MTH 511 with C- or better
This course is repeatable for 18 credits.

MTH 413. REAL ANALYSIS. (3 Credits)
Measure and integration theory, basic convergence theorems, Lebesgue spaces, Fubini's theorem, Radon-Nikodym theorem, and applications. Banach spaces including  Baire category theorems, and Hilbert spaces. 
Prerequisites: MTH 412 with C- or better or MTH 512 with C- or better
This course is repeatable for 18 credits.

MTH 419. MULTIVARIABLE ADVANCED CALCULUS. (3 Credits)
A rigorous development of multivariable advanced calculus, including continuity and compactness in multivariable Euclidean spaces, differentiation and approximation of multivariable functions, the inverse function theorem and the implicit function theorem, integration in several variables. 
Prerequisites: MTH 312 with B or better

MTH 420. MODELS AND METHODS OF APPLIED MATHEMATICS. (3 Credits)
Discrete and continuous mathematical models and methods for analysis, including linear analysis, equilibrium and minimum principles, calculus of variations, principal component analysis and orthogonal expansions, asymptotic and Fourier analysis, least squares, constrained and unconstrained optimization, inverse problems, and Monte Carlo techniques. Particular models and methods covered may vary annually. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]

MTH 427. INTRODUCTION TO MATHEMATICAL BIOLOGY. (3 Credits)
Modeling and mathematical analysis of biological processes using first principles at scales ranging from the molecular to the population level. Deterministic models are studied in both discrete and continuous time and analyzed using linearization principles, linear and nonlinear stability techniques, phase plane methods, and methods from partial differential equations. Results obtained from mathematical analysis will be qualitatively interpreted and applied to the biological process under investigation. All courses used to satisfy MTH prerequisites must be completed with a C- or better. 
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]

MTH 428. STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY. (3 Credits)
An introduction to stochastic modeling of biological processes. The stochastic models covered may include Markov processes in both continuous and discrete time, urn models, branching processes, and coalescent processes. The biological applications may include genetic drift, population dynamics, genealogy, demography, and epidemiology. Mathematical results will be qualitatively interpreted and applied to the biological process under investigation. 
Prerequisites: MTH 341 with C or better and (MTH 361 [C] or MTH 463 [C] or MTH 563 [C])

MTH 430. METRIC SPACES AND TOPOLOGY. (3 Credits)
Fundamental notions of metric space topology. Examples of Euclidean, non-Euclidean and other fundamental metric spaces including the Heilbert Cube and two-dimensional surfaces. Characterization and classification results for metric spaces. Selected applications of topology, possibly including the structure of molecules and/or networks. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: MTH 311 with C- or better
Recommended: MTH 311

MTH 434. INTRODUCTION TO DIFFERENTIAL GEOMETRY. (3 Credits)
Curves and surfaces in Euclidean space; geodesics; curvature; introduction to tensor algebra and differential forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: (MTH 255 with C- or better or MTH 255H with C- or better) and MTH 342 [C-]
Recommended: MTH 311

MTH 435. DIFFERENTIAL GEOMETRY. (3 Credits)
Differentiable 2-manifolds; curvature; geodesics; tensor algebra and the algebra of exterior differential forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: MTH 434 with C- or better or MTH 534 with C- or better

MTH 437. GENERAL RELATIVITY. (3 Credits)
Geometry of special relativity. Tensor analysis, metrics, geodesics, curvature. Einstein field equations, cosmological models, black holes. Selected topics such as global structure, conserved quantities, spinors. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: (MTH 434 with C- or better or MTH 534 with C- or better) and MTH 342 [C-]
Recommended: MTH 311

MTH 440. COMPUTATIONAL NUMBER THEORY. (3 Credits)
Development of the number theory used in some basic tests of primality and methods of factoring integers. Applications to cryptography. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: MTH 231 with C- or better or MTH 343 with C- or better or MTH 355 with C- or better

MTH 441. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C- or better. 
Prerequisites: MTH 343 with C- or better and (MTH 342 [C-] or MTH 440 [C-] or MTH 540 [C-])
MTH 442. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 441 with C- or better or MTH 541 with C- or better

MTH 443. ABSTRACT LINEAR ALGEBRA. (3 Credits)
Abstract vector spaces. Linear transformations, eigenvalues and eigenvectors, the Jordan canonical form, inner product spaces. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 342 with C- or better or MTH 343 with C- or better

MTH 451. NUMERICAL LINEAR ALGEBRA. (3 Credits)
Computation of solutions of linear systems using direct and iterative methods; least-squares solution of overdetermined systems; computation of eigenvalues and eigenvectors. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 341 with C- or better
Recommended: Programming experience, MTH 342 and MTH 351

MTH 452. NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of initial-value problems using Runge-Kutta methods and linear multistep methods; introduction to boundary-value problems. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and (MTH 306 with C- or better or MTH 306H with C- or better) or MTH 341 with C- or better or (MTH 256 with C- or better or MTH 256H with C- or better) and (MTH 265 with C- or better or MTH 265H [C-])
Recommended: MTH 351 or MTH 451 or MTH 551

MTH 453. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of boundary value problems and initial-boundary value problems using finite difference and finite element methods. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 452 with C- or better or MTH 552 with C- or better

MTH 463. PROBABILITY I. (3 Credits)
An introduction to probability theory; topics covered include: the axioms of probability, probability spaces and models, independence, random variables; densities, distributions, expectation, and variance; probability inequalities, the law of large numbers, and the binomial central limit theorem. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 311 (may be taken concurrently) with C- or better

MTH 464. PROBABILITY II. (3 Credits)
Transformations of random variables; sums of independent random variables, generating functions, characteristic functions, the central limit theorem and other weak limit theorems. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 463 with C- or better or MTH 563 with C- or better) and MTH 341 [C-]

MTH 465. PROBABILITY III. (3 Credits)
Random variables, central limit theorem; distributions of standard statistics; Markov chains, continuous and discontinuous stochastic processes. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 464 with C- or better or MTH 564 with C- or better

MTH 467. ACTUARIAL MATHEMATICS. (3 Credits)
Foundations of actuarial science from the point of view of mathematical models that arise in the design and management of insurance systems. Most models will be life insurance based. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 463 with C- or better or MTH 563 with C- or better or ST 421 with C- or better

MTH 480. SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Systems of two first-order differential equations, phase portraits, linearization and the stability of equilibria, conservative systems, reversible systems, limit cycles and the Poincare-Bendixson Theorem. Additional topics selected from Hamiltonian systems, Hopf bifurcation or Lorenz equations and chaos. MTH 480 and MTH 481 cannot both be taken for credit. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and MTH 341 [C-]

MTH 481. APPLIED ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Linear and nonlinear systems of ordinary differential equations, elementary stability theory, higher order equations, boundary value problems, series solution of ordinary differential equations. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and (MTH 253 with C- or better or MTH 253H with C- or better) or (MTH 265 with C- or better or MTH 265H with C- or better) and (MTH 341 [C-] or (MTH 264 [C-] or MTH 264H [C-]) or (MTH 306 [C-] or MTH 306H [C-]))

MTH 482. APPLIED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Partial differential equations, Bessel's and Legendre's equations, Fourier analysis, separation of variables, transform methods. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 480 with C- or better or MTH 481 with C- or better or MTH 581 with C- or better

MTH 483. COMPLEX VARIABLES. (3 Credits)
Introduction to the complex differential and integral calculus: Cauchy's theorem and formula, the residue calculus, power series and Laurent series, harmonic functions, conformal mapping, and applications. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: (MTH 256 with C- or better or MTH 256H with C- or better) and (MTH 253 [C-] or (MTH 306 [C-] or MTH 306H [C-]) or (MTH 265 [C-] or MTH 265H [C-]))

MTH 490. INTENSIVE SUMMER RESEARCH IN MATHEMATICS. (12 Credits)
Combination of seminar, lectures, and individual research projects designed to introduce students to research mathematics.
This course is repeatable for 99 credits.

MTH 491. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Orderd fields, number systems (natural, integer, rational, real, and complex), fundamental theorems of arithmetic and algebra, algebraic and transcendental numbers, constructible points and numbers and the classical geometric constructions, Polya’s problem solving heuristics and strategies. Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 341 with C- or better
MTH 492. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Major results of Euclidean geometry, axiom systems for Euclidean geometry, dependency tree of Euclidean theorems, groups of geometric transformations with applications to symmetries of plane and solid objects, Euler's formula, tilings and tessellations, isometries and similarities of the plane (translations, rotations, reflections, glide reflections, dilations). Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 491 with C- or better or MTH 591 with C- or better

MTH 493. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Geometric transformations as real, complex, and matrix functions, invariants and genealogy of geometric transformations, extensions to transformations of the sphere and of three-dimensional space, selected applications chosen from fractals, analysis of frieze and crystallographic patterns, problem solving, groups of symmetries, computer graphics, and the use of dynamic geometry software. Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C- or better.
Prerequisites: MTH 492 with C- or better or MTH 592 with C- or better

MTH 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

MTH 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MTH 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

MTH 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 510. OCCUPATIONAL INTERNSHIP. (3-12 Credits)
Planned and supervised training experience at selected government, industrial, or business placement sites. Must be followed by a one-hour post-internship seminar. Consult departmental head advisor. Graded P/N.
This course is repeatable for 16 credits.

MTH 511. REAL ANALYSIS. (3 Credits)
Properties of metric spaces and normed spaces, including lp spaces. Completeness and applications, including fixed point theorems. Compactness. Equicontinuity and the Arzela-Ascoli theorem. Uniform continuity and uniform convergence, including applications.
This course is repeatable for 18 credits.
Recommended: MTH 312 and MTH 341

MTH 512. REAL ANALYSIS. (3 Credits)
Measure and integration theory, basic convergence theorems, Lebesgue spaces, Radon-Nikodym theorem, applications. Banach spaces including Baire category theorems, and Hilbert spaces.
Prerequisites: MTH 511 with C- or better
This course is repeatable for 18 credits.

MTH 513. REAL ANALYSIS. (3 Credits)
Measure and integration theory, basic convergence theorems, Lebesgue spaces, Radon-Nikodym theorem, and applications. Banach spaces including Baire category theorems, and Hilbert spaces.
Prerequisites: MTH 512 with C- or better
This course is repeatable for 18 credits.

MTH 520. MODELS AND METHODS OF APPLIED MATHEMATICS. (3 Credits)
Discrete and continuous mathematical models and methods for analysis, including linear analysis, equilibrium and minimum principles, calculus of variations, principal component analysis and orthogonal expansions, asymptotic and Fourier analysis, least squares, constrained and unconstrained optimization, inverse problems, and Monte Carlo techniques. Particular models and methods covered may vary annually. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 256 or MTH 256H) and MTH 341

MTH 524. DYNAMICAL SYSTEMS THEORY AND APPLICATIONS. (3 Credits)
Theory, models, and problems for discrete and/or continuous dynamical systems. Depending on term, the emphasis may be toward deterministic or stochastic systems. Topics generally include stability theory, periodic behavior, and chaotic systems. Models selected from biology, economics, fluid dynamics, and electrical and mechanical systems. May be repeated once for credit with a different topic. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 624
This course is repeatable for 6 credits.
Recommended: MTH 341 and MTH 342 and MTH 311 and MTH 312 and MTH 361

MTH 525. DYNAMICAL SYSTEMS THEORY AND APPLICATIONS. (3 Credits)
Theory, models, and problems for discrete and/or continuous dynamical systems. Depending on term, the emphasis may be toward deterministic or stochastic systems. Topics generally include stability theory, periodic behavior, and chaotic systems. Models selected from biology, economics, fluid dynamics, and electrical and mechanical systems. May be repeated once for credit with a different topic. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 625
This course is repeatable for 6 credits.
Recommended: MTH 341 and MTH 342 and MTH 311 and MTH 312 and MTH 361

MTH 527. INTRODUCTION TO MATHEMATICAL BIOLOGY. (3 Credits)
Modeling and mathematical analysis of biological processes using first principles at scales ranging from the molecular to the population level. Deterministic models are studied in both discrete and continuous time and analyzed using linearization principles, linear and nonlinear stability techniques, phase plane methods, and methods from partial differential equations. Results obtained from mathematical analysis will be qualitatively interpreted and applied to the biological process under investigation. All courses used to satisfy MTH prerequisites must be completed with a C or better.
Recommended: (MTH 256 or MTH 256H) and MTH 341
MTH 528. STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY. (3 Credits)
An introduction to stochastic modeling of biological processes. The stochastic models covered may include Markov processes in both continuous and discrete time, urn models, branching processes, and coalescent processes. The biological applications may include genetic drift, population dynamics, genealogy, demography, and epidemiology. Mathematical results will be qualitatively interpreted and applied to the biological process under investigation. All courses used to satisfy MTH prerequisites must be completed with a C or better.
Recommended: MTH 341 and (MTH 361 or MTH 463 or MTH 563)

MTH 531. GENERAL TOPOLOGY AND FUNDAMENTAL GROUPS. (3 Credits)
Topological spaces and maps. Separation axioms, compactness, convergence, extension theorems, metrizability and compactification. Product spaces and simplicial complexes. Definition and basic properties of the fundamental group functor, with applications to the theory of covering spaces. Selected topics from dimension theory, manifold theory, and other areas of topology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 623, MTH 631

MTH 532. GENERAL TOPOLOGY AND FUNDAMENTAL GROUPS. (3 Credits)
Topological spaces and maps. Separation axioms, compactness, convergence, extension theorems, metrizability and compactification. Product spaces and simplicial complexes. Definition and basic properties of the fundamental group functor, with applications to the theory of covering spaces. Selected topics from dimension theory, manifold theory, and other areas of topology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 632

MTH 534. INTRODUCTION TO DIFFERENTIAL GEOMETRY. (3 Credits)
Curves and surfaces in Euclidean space; geodesics; curvature; introduction to tensor algebra and differential forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 255 or MTH 255H) and MTH 342 and MTH 311

MTH 535. DIFFERENTIAL GEOMETRY. (3 Credits)
Differentiable 2-manifolds; curvature; geodesics; tensor algebra and the algebra of exterior differential forms with emphasis on Euclidean space; differentiation of tensors and forms; integration of forms; selected applications. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 434 or MTH 534

MTH 537. GENERAL RELATIVITY. (3 Credits)
Geometry of special relativity. Tensor analysis, metrics, geodesics, curvature. Einstein field equations, cosmological models, black holes. Selected topics such as global structure, conserved quantities, spinors. All courses used to satisfy MTH prerequisites must be completed with C or better.
Prerequisites: MTH 434 with C or better or MTH 534 with C or better
Recommended: MTH 311

MTH 540. COMPUTATIONAL NUMBER THEORY. (3 Credits)
Development of the number theory used in some basic tests of primality and methods of factoring integers. Applications to cryptology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 231 or MTH 343 or MTH 355

MTH 541. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 343 and (MTH 342 or MTH 440 or MTH 540)

MTH 542. APPLIED AND COMPUTATIONAL ALGEBRA. (3 Credits)
Applications of fundamental algebraic systems to topics such as factorization of polynomials, finding roots of polynomials, error correcting codes. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 441 or MTH 541

MTH 543. ABSTRACT LINEAR ALGEBRA. (3 Credits)
Abstract vector spaces. Linear transformations, eigenvalues and eigenvectors, the Jordan canonical form, inner product spaces. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 342 and MTH 343

MTH 551. NUMERICAL LINEAR ALGEBRA. (3 Credits)
Computation of solutions of linear systems using direct and iterative methods; least-squares solution of overdetermined systems; computation of eigenvalues and eigenvectors. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 341, MTH 342, MTH 351 and programming experience

MTH 552. NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of initial-value problems using Runge-Kutta methods and linear multistep methods; introduction to boundary-value problems. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: Programming experience and (MTH 256 or MTH 256H) and (MTH 306 or MTH 306H or MTH 341) and (MTH 351 or MTH 451 or MTH 551)

MTH 553. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Numerical solution of boundary value problems and initial-boundary value problems using finite difference and finite element methods. Analysis of stability, accuracy, and implementation of methods. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 452 or MTH 552

MTH 563. PROBABILITY II. (3 Credits)
Analysis of Markov chains; applications to problems of reliability and queuing. Generating functions and their applications to problems of reliability and queuing. Linear multistep methods; introduction to boundary-value problems. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 312

MTH 564. PROBABILITY II. (3 Credits)
Transformations of random variables; sums of independent random variables, generating functions, characteristic functions, the central limit theorem and other weak limit theorems. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 341 and (MTH 463 or MTH 563)
MTH 565. PROBABILITY III. (3 Credits)
Random variables, central limit theorem; distributions of standard statistics; Markov chains, continuous and discontinuous stochastic processes. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 464 or MTH 564

MTH 567. ACTUARIAL MATHEMATICS. (3 Credits)
Foundations of actuarial science from the point of view of mathematical models that arise in the design and management of insurance systems. Most models will be life insurance based. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 463 or MTH 563) or ST 421.

MTH 578. PROBABILITY AND DATA ANALYSIS IN K-8 MATHEMATICS. (3 Credits)
Key ideas and topics in probability, data analysis, and statistics critical for the mathematics content knowledge of elementary teachers in grades K-8. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 390

MTH 581. APPLIED ORDINARY DIFFERENTIAL EQUATIONS. (3 Credits)
Linear and nonlinear systems of ordinary differential equations, elementary stability theory, higher order equations, boundary value problems, series solution of ordinary differential equations. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 256 or MTH 256H) and (MTH 253 or MTH 253H) or (MTH 341) or (MTH 306 or MTH 306H)

MTH 582. APPLIED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)
Partial differential equations, Bessel's and Legendre's equations, Fourier analysis, separation of variables, transform methods. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 480 or MTH 481 or MTH 581

MTH 583. COMPLEX VARIABLES. (3 Credits)
Introduction to the complex differential and integral calculus: Cauchy's theorem and formula, the residue calculus, power series and Laurent series, harmonic functions, conformal mapping, and applications. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: (MTH 256 or MTH 256H) and (MTH 253 or MTH 306 or MTH 306H)

MTH 590. TOPICS IN SECONDARY MATHEMATICS. (3 Credits)
Key ideas and topics in discrete mathematics critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 680
Recommended: MTH 390

MTH 591. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Ordered fields, number systems (natural, integer, rational, real, and complex), fundamental theorems of arithmetic and algebra, algebraic and transcendental numbers, constructible points and numbers and the classical geometric constructions, Polya's problem solving heuristics and strategies. Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 341

MTH 592. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Major results of Euclidean geometry, axioms for Euclidean geometry, dependency tree of Euclidean theorems, groups of geometric transformations with applications to symmetries of plane and solid objects, Euler's formula, tilings and tessellations, isometries and similitudes of the plane (translations, rotations, reflections, glide reflections, dilations). Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 491 or MTH 591

MTH 593. ALGEBRA AND GEOMETRIC TRANSFORMATIONS. (3 Credits)
Geometric transformations as real, complex, and matrix functions, invariants and genealogy of geometric transformations, extensions to transformations of the sphere and of three-dimensional space, selected applications chosen from fractals, analysis of frieze and crystallographic patterns, problem solving, groups of symmetries, computer graphics, and the use of dynamic geometry software. Intended primarily for prospective mathematics teachers. All courses used to satisfy MTH prerequisites must be completed with C or better.
Recommended: MTH 492 or MTH 592

MTH 594. NUMBER SYSTEMS AND OPERATIONS IN SECONDARY MATHEMATICS. (3 Credits)
Key ideas and topics in number systems, operations, place value, and algorithms critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 681
Recommended: MTH 390

MTH 598. PROBABILITY AND DATA ANALYSIS IN SECONDARY MATHEMATICS. (3 Credits)
Key ideas and topics in probability, data analysis, and statistics critical for the mathematics content knowledge of middle and high school teachers in grades 6-12. Based on the recommendations of The Mathematical Education of Teachers by the Conference Board of the Mathematical Sciences. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 685
Recommended: MTH 390

MTH 599. SPECIAL TOPICS. (0-16 Credits)
Topics may vary. This course is repeatable for 18 credits.

MTH 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MTH 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MTH 606. SPECIAL PROJECTS. (1-16 Credits)
Graded P/N. This course is repeatable for 16 credits.

MTH 607. SEMINAR. (1-16 Credits)
This course is repeatable for 99 credits.
**MTH 611. COMPLEX ANALYSIS. (3 Credits)**
Basic theory of analytic functions of a complex variable, including Cauchy's theorem, residue theorem, analytic continuation, conformal mappings, entire, and meromorphic functions. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Recommended:** MTH 411 or MTH 511

**MTH 612. COMPLEX ANALYSIS. (3 Credits)**
Basic theory of analytic functions of a complex variable, including Cauchy's theorem, residue theorem, analytic continuation, conformal mappings, entire, and meromorphic functions. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Recommended:** MTH 611

**MTH 614. FUNCTIONAL ANALYSIS. (3 Credits)**
Topological vector spaces, generalized functions, operator theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Recommended:** MTH 513

**MTH 619. TOPICS IN ANALYSIS. (1-12 Credits)**
**Equivalent to:** MTH 620
This course is repeatable for 12 credits.

**MTH 621. PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)**
Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. Square summable function methods and integral equations. This course is the first in a year-long sequence of MTH 621, MTH 622, MTH 623. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Equivalent to:** MTH 529
This course is repeatable for 6 credits.
**Recommended:** 6 credits of senior-level analysis

**MTH 622. PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)**
Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. Square summable function methods and integral equations. This course is the first in a year-long sequence of MTH 621, MTH 622, MTH 623. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Prerequisites:** MTH 621 with C or better
**Equivalent to:** MTH 530
This course is repeatable for 6 credits.

**MTH 623. PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)**
Partial differential equations of physics, including those of potential theory, wave propagation, and heat flow, treated by classical means, generalized functions and variational principles. Square summable function methods and integral equations. This course is the third one in year-long sequence. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Prerequisites:** MTH 621 with C or better and MTH 622 [C]
**Equivalent to:** MTH 531
This course is repeatable for 6 credits.

**MTH 627. ADVANCED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)**
Advanced theory including existence proofs and distributional approach. Normally offered fall term in odd years. All courses used to satisfy MTH prerequisites must be completed with C or better.
**This course is repeatable for 6 credits.**
**Recommended:** MTH 413 or MTH 513

**MTH 628. ADVANCED PARTIAL DIFFERENTIAL EQUATIONS. (3 Credits)**
Advanced theory including existence proofs and distributional approach. Normally offered winter term in even years. All courses used to satisfy MTH prerequisites must be completed with C or better.
**This course is repeatable for 6 credits.**
**Recommended:** MTH 627

**MTH 634. ALGEBRAIC TOPOLOGY. (3 Credits)**
Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Recommended:** MTH 532

**MTH 635. ALGEBRAIC TOPOLOGY. (3 Credits)**
Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Recommended:** MTH 532 and MTH 634

**MTH 636. ALGEBRAIC TOPOLOGY. (3 Credits)**
Simplicial and singular homology, products, and cohomology; applications to fixed-point and separation theorems. Topics selected from homotopy, manifold and obstruction theory. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Recommended:** MTH 532 and MTH 635

**MTH 644. ABSTRACT ALGEBRA I. (3 Credits)**
Group theory, rings and fields, Galois theory. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Equivalent to:** MTH 544
**Recommended:** MTH 443 or MTH 543

**MTH 645. ABSTRACT ALGEBRA II. (3 Credits)**
Group theory, rings and fields, Galois theory. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Equivalent to:** MTH 545
**Recommended:** MTH 644

**MTH 649. TOPICS IN ALGEBRA AND NUMBER THEORY. (3 Credits)**
This course is repeatable for 27 credits.

**MTH 654. NUMERICAL ANALYSIS. (3 Credits)**
Advanced topics in numerical analysis, such as finite volume methods and finite element methods for partial differential equations, numerical methods for inverse problems, and image processing. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Equivalent to:** MTH 554
**This course is repeatable for 12 credits.**
**Recommended:** Familiarity with numerical methods

**MTH 655. NUMERICAL ANALYSIS. (3 Credits)**
Advanced topics in numerical analysis, such as finite volume methods and finite element methods for partial differential equations, numerical methods for inverse problems, and image processing. All courses used to satisfy MTH prerequisites must be completed with C or better.
**Equivalent to:** MTH 555
**This course is repeatable for 12 credits.**
**Recommended:** Familiarity with numerical methods
MTH 656. NUMERICAL ANALYSIS. (3 Credits)
Advanced topics in numerical analysis, such as finite volume methods and finite element methods for partial differential equations, numerical methods for inverse problems, and image processing. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 556
This course is repeatable for 12 credits.
Recommended: Familiarity with numerical methods

MTH 657. TOPICS IN APPLIED MATHEMATICS. (1-12 Credits)
Previous topics have included turbulence, financial mathematics and probability methods in partial differential equations.
Equivalent to: MTH 629
This course is repeatable for 12 credits.

MTH 658. TOPICS IN MATHEMATICAL MODELING. (1-12 Credits)
Mathematical treatment of topics of current interest in the physical and biological sciences and technology. May be repeated for credit when topic varies.
Equivalent to: MTH 599
This course is repeatable for 12 credits.

MTH 659. TOPICS IN NUMERICAL ANALYSIS. (1-12 Credits)
This course is repeatable for 12 credits.

MTH 664. PROBABILITY THEORY. (3 Credits)
General theory of probability measures and random variables, including weak convergence, characteristic functions, central limit theory, conditional expectations, martingales. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: CH 574
Recommended: MTH 411 or MTH 511

MTH 665. PROBABILITY THEORY. (3 Credits)
General theory of probability measures and random variables, including weak convergence, characteristic functions, the central limit theorem, and the Brownian motion process. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 575
Recommended: MTH 664

MTH 669. TOPICS IN STOCHASTIC PROCESSES. (1-12 Credits)
Previous topics have included Markov processes, martingales, branching processes, and stochastic differential equations.
This course is repeatable for 12 credits.

MTH 674. DIFFERENTIAL GEOMETRY OF MANIFOLDS. (3 Credits)
Differentiable manifolds, tangent bundles, vector fields and flows, submanifolds, Riemannian metrics, differential forms, integration on manifolds. Selected topics such as foliations, Lie groups, and de Rham cohomology. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 637
Recommended: MTH 341 and (MTH 411 or MTH 511)

MTH 675. DIFFERENTIAL GEOMETRY OF MANIFOLDS. (3 Credits)
Differentiable manifolds, connections in linear bundles, Riemannian manifolds and submanifolds. Selected topics such as variational theory of geodesics, harmonic forms, and characteristic classes. Normally offered alternate years. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 638
Recommended: MTH 674

MTH 676. TOPICS IN TOPOLOGY. (3 Credits)
Equivalent to: MTH 639
This course is repeatable for 27 credits.

MTH 679. TOPICS IN GEOMETRY. (1-12 Credits)
Equivalent to: MTH 640
This course is repeatable for 12 credits.

MTH 680. MODERN APPROACHES TO CALCULUS. (3 Credits)
Alternative approaches to calculus instruction based on the availability of computers and calculators. Applications of symbolic-graphical calculators, spreadsheets, symbolic algebra systems, and graphics packages to the teaching of calculus. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 650
Recommended: MTH 253

MTH 682. TEACHING AND LEARNING PROBABILITY AND STATISTICS. (3 Credits)
Experimental, activity-based approaches to introductory probability and statistics are explored. Topics include computer simulations, exploratory data analysis, misuses of statistics, and misconceptions of probability. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 685
Recommended: Ability to program in either BASIC or PASCAL

MTH 684. COMPUTERS AND MATHEMATICS. (3 Credits)
A variety of mathematical problems are investigated with a laboratory approach using microcomputers and a wide variety of software. Problems may be taken from number theory, calculus, geometry, probability and elementary numerical analysis. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 597
Recommended: Ability to program in either BASIC or PASCAL

MTH 685. ADVANCED PROBLEM SOLVING. (3 Credits)
Mathematical problem solving using the heuristic approach of George Polya. Problems may be taken from a variety of areas, including number theory, calculus, geometry, probability, abstract and linear algebra. All courses used to satisfy MTH prerequisites must be completed with C or better.
Equivalent to: MTH 598

MTH 689. TOPICS IN MATHEMATICS EDUCATION. (1-12 Credits)
Topics may vary.
Equivalent to: MTH 599
This course is repeatable for 12 credits.

MTH 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Mech/Ind/Mfg Engineering (MIME)

MIME 101. INTRODUCTION TO MIME. (3 Credits)
Provides students with an overview of mechanical, industrial, manufacturing, and energy systems engineering careers and an introduction to technical areas of study. Skills necessary for success in both the academic curriculum and in the engineering profession will also be emphasized, including communication and ethics. Lec/rec.
Equivalent to: ME 101, MIME 101H

MIME 101H. INTRODUCTION TO MIME. (3 Credits)
Provides students with an overview of mechanical, industrial, manufacturing, and energy systems engineering careers and an introduction to technical areas of study. Skills necessary for success in both the academic curriculum and in the engineering profession will also be emphasized, including communication and ethics. Lec/rec.
Attributes: HNRS – Honors Course Designator
Equivalent to: MIME 101
ME 199. SPECIAL TOPICS. (0-4 Credits)
Equivalent to: MIME 101

ME 299. SPECIAL TOPICS. (0-4 Credits)
This course is repeatable for 4 credits.

ME 399. SPECIAL TOPICS. (0-4 Credits)
Special topics in mechanical, industrial, and manufacturing engineering.
This course is repeatable for 16 credits.

ME 497. *MIME CAPSTONE DESIGN. (4 Credits)
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (IE 355 with C or better and IE 356 [C] and IE 367 [C] and IE 368 [C] and WR 327 [C]) or (MATS 322 [C] and (ENGR 391 [C] or ENGR 391H [C]) and ME 250 [C] and (ME 312 [C] or ME 312H [C]) and (ME 317 [C] or ME 317H [C]) and (ME 383 [C] or ME 383H [C]) and WR 327 [C] and (ST 314 [C] or ST 314H [C]))
Equivalent to: ESE 497, IE 497, ME 497

ME 498. *MIME CAPSTONE DESIGN. (4 Credits)
Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MIME 497 with C or better or ESE 497 with C or better
Equivalent to: ESE 498, IE 498, ME 498

ME 504. WRITING AND CONFERENCE/EXPLORATION. (1-9 Credits)
Students will be allowed to register for a variable number of MIME 504 credits to bring their registration up to full-time status (9 credits). Graded P/N.
Equivalent to: IE 504, ME 504, ROB 504
This course is repeatable for 15 credits.

ME 507. SEMINAR/NEW STUDENT ORIENTATION. (1 Credit)

Mechanical Engineering (ME)

ME 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ME 250. INTRODUCTION TO MANUFACTURING PROCESSES. (1 Credit)
Use of measuring and layout tools, interpretation of blueprints and drawings, identification of engineering materials. Operation of machine tools, including calculation of machining parameters. Operation of gas and MIG welding equipment. Lec/lab. Graded P/N.
Prerequisites: ENGR 248 with C or better and (PH 211 [C] or PH 211H [C])

ME 299. SPECIAL TOPICS. (1-16 Credits)
Graded P/N.
Equivalent to: ME 299H
This course is repeatable for 16 credits.

ME 299H. SPECIAL STUDIES. (1-16 Credits)
Graded P/N.
Attributes: HNRS – Honors Course Designator
Equivalent to: ME 299
This course is repeatable for 16 credits.

ME 306. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ME 311. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, moment and the second law of thermodynamics are included. CROSSTLISTED as ME 311/NSE 311.
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ENGR 311, ENGR 311H, ME 311H, ME 311, NE 311H, NSE 311, NSE 311H

ME 311H. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, moment and the second law of thermodynamics are included. CROSSTLISTED as ME 311/NSE 311.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ENGR 311, ENGR 311H, ME 311H, ME 311, NE 311H, NSE 311, NSE 311H

ME 312. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSTLISTED as ME 312/NSE 312.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ENGR 312, ME 312H, NE 312, NE 312H, NSE 312, NSE 312H

ME 312H. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSTLISTED as ME 312/NSE 312.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 312, NE 312, NE 312H, NSE 312, NSE 312H

ME 316. MECHANICS OF MATERIALS. (3 Credits)
Determination of stresses, deflections, and stability of deformable bodies with an introduction to finite element analysis.
Prerequisites: (ENGR 213 with C or better or ENGR 213H with C or better) and (MTH 256 [C] or MTH 256H [C])

ME 317. INTERMEDIATE DYNAMICS. (4 Credits)
Continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers.
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 317H

ME 317H. INTERMEDIATE DYNAMICS. (4 Credits)
Continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C]))
Equivalent to: ME 317
ME 331. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Prerequisites: ((MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C]) and (ENGR 311 [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ENGR 331, ENGR 331H, ME 331H, NE 331H, NSE 331, NSE 331H

ME 331H. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]) and (ENGR 212 [C] or ENGR 212H [C]) and (ENGR 311 [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C])
Equivalent to: ME 331, ME 331H, NSE 331, NSE 331H

ME 332. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Prerequisites: ((MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (ME 311 [C] or ME 311H [C] or NE 311 [C] or NE 311H [C]) and (ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C])
Equivalent to: ME 332H, NE 332, NSE 332, NSE 332H

ME 332H. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Attributes: HNRS – Honors Course Designator
Prerequisites: ((MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (ME 311 [C] or ME 311H [C] or NE 311 [C] or NE 311H [C]) and (ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C])
Equivalent to: ENGR 332, ME 332, NE 332, NE 332H, NSE 332, NSE 332H

ME 348. ADVANCED SOLID MODELING. (1 Credit)
Practical application of graphical communication theory using advanced solid modeling software to capture design intent and generate engineering drawings. Lec/lab. Graded P/N.
Prerequisites: ENGR 248 with C or better

ME 373. MECHANICAL ENGINEERING METHODS. (3 Credits)
Analytical and numerical methods for solving representative mechanical engineering problems. Lec/rec.
Prerequisites: (ENGR 112 with C or better or ENGR 112H with C or better) and (MTH 256 [C] or MTH 256H [C]) and MTH 341 [C]
Equivalent to: ME 373H

ME 373H. MECHANICAL ENGINEERING METHODS. (3 Credits)
Analytical and numerical methods for solving representative mechanical engineering problems. Lec/rec.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 112 with C or better or ENGR 112H with C or better) and (MTH 256 [C] or MTH 256H [C]) and MTH 341 [C]
Equivalent to: ME 373

ME 382. INTRODUCTION TO DESIGN. (4 Credits)
Organization, planning, economics, and the use of creativity and optimization in solving mechanical design problems. Case studies and/or industrial design problems. Lec/lab.
Prerequisites: ENGR 248 with C or better and ME 250 (may be taken concurrently) [C] and ENGR 212 [C] and ENGR 213 [C]
Equivalent to: ME 382H

ME 382H. INTRODUCTION TO DESIGN. (4 Credits)
Organization, planning, economics, and the use of creativity and optimization in solving mechanical design problems. Case studies and/or industrial design problems. Lec/lab.
Attributes: HNRS – Honors Course Designator
Prerequisites: ME 316 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 212H [C]) and ENGR 213 [C]
Equivalent to: ME 383H

ME 383. MECHANICAL COMPONENT DESIGN. (4 Credits)
Failure analysis and design of machine components. Lec/lab.
Prerequisites: ME 316 with C or better and ME 250 (may be taken concurrently) [C] and (ENGR 212 [C] or ENGR 212H [C]) and ENGR 213 [C]
Equivalent to: ME 383

ME 401. RESEARCH. (1-16 Credits)
This course is repeatable for 9 credits.

ME 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

ME 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: ME 405H
This course is repeatable for 9 credits.

ME 405H. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: ME 405
Attributes: HNRS – Honors Course Designator
This course is repeatable for 9 credits.

ME 406. PROJECTS. (1-16 Credits)
This course is repeatable for 15 credits.

ME 407. SEMINAR. (1-16 Credits)
This course is repeatable for 2 credits.

ME 410. INTERNSHIP. (1-16 Credits)
Credits may not apply toward BS degree in Mechanical Engineering. Graded P/N.
This course is repeatable for 16 credits.
ME 411. AEROSPACE APPLICATIONS IN MECHANICAL ENGINEERING. (4 Credits)
Provides students with the fundamentals of mechanical engineering applications to aerospace. Topics covered include an overview of modern aircraft and spacecraft analysis, with an emphasis on performance, stability, structures, materials, FAA and FAR standards and current professional practices in the conceptual design of aerospace vehicles. Student projects will integrate course topics.
Prerequisites: (ME 316 with C or better and (ME 317 [C] or ME 317H [C]) and (ME 331 [C] or ME 331H [C]) and (ME 373 [C] or ME 373H [C]))

ME 412. DESIGN OF MECHANISMS. (4 Credits)
Analysis and study of the function, classification, position, velocity, and acceleration of multi-element mechanical linkages and mechanisms. Synthesis of mechanisms for specified multiple point paths, quick return, dwell, and straight-line motion. The lecture will instruct students in the kinematic analysis and synthesis of mechanisms through the use of theory and software packages. The laboratory will familiarize students with a modern mechanism design and animation software package. Lec/lab.
Prerequisites: (ME 317 with C or better or ME 317H with C or better) and ME 383 [C]

ME 413. COMPUTER-AIDED DESIGN AND MANUFACTURING. (4 Credits)
Introduces students to the use of computers in several extended areas of product design and manufacturing. These areas include product data management in a sustaining engineering environment; computer-aided manufacturing (CAM) and computer numerical control (CNC) operations and technology; the use of programmable logic controllers (PLCs) for industrial control systems; and the use of simulation software for virtual prototyping for Design/Manufacturing/Validation. Lec/lab.
Prerequisites: (ME 382 with C or better or ME 382H with C or better or IE 366 with C or better or IE 366 with C or better)
Equivalent to: MFGE 413

ME 420. APPLIED STRESS ANALYSIS. (4 Credits)
Elasticity theory, failure theories, energy methods, finite element analysis. Prerequisites: ME 316 with C or better

ME 422. MECHANICAL VIBRATIONS. (4 Credits)
Dynamic response of single and multiple degree-of-freedom systems. Prerequisites: ME 317 with C or better or ME 317H with C or better
Equivalent to: ME 422H

ME 422H. MECHANICAL VIBRATIONS. (4 Credits)
Dynamic response of single and multiple degree-of-freedom systems.
Attributes: HNRS – Honors Course Designator
Prerequisites: ME 317 with C or better or ME 317H with C or better
Equivalent to: ME 422

ME 424. FINITE ELEMENT MODELING OF MECHANICAL ENGINEERING SYSTEMS. (3 Credits)
Application of modern finite element code in the analysis of complex mechanical engineering systems. Extensive use of engineering workstations. Lec/lab.
Prerequisites: ME 420 with C or better or ME 520 with C or better

ME 430. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSLISTED as ECE 451/ME 430.
Prerequisites: (ME 317 with C or better or ME 317H with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C])))
Equivalent to: ECE 451, ME 430H

ME 430H. SYSTEMS DYNAMICS AND CONTROL. (4 Credits)
Modeling and analysis of linear continuous systems in time and frequency domains. Fundamentals of single-input-single-output control system design. CROSSLISTED as ECE 451/ME 430.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 317 with C or better or ME 317H with C or better or (ECE 351 with C or better and ECE 352 [C] and (ENGR 212 [C] or ENGR 212H [C])))
Equivalent to: ECE 451, ME 430

ME 443. RENEWABLE ENERGY: THERMAL FLUID SYSTEMS. (4 Credits)
Evaluates several thermal/fluid power conversion strategies that deal with both thermal and fluid energy sources in terms of basic conversion technology, resource potential and developmental challenges. There are four modules, each targeting a particular renewable energy system in thermal and fluid sciences.
Prerequisites: (ME 311 with C or better or ME 311H with C or better or ME 311 with C or better or ME 311H with C or better) and (ME 331 [C] or ME 331H [C] or NE 331 [C] or NE 331H [C]) and (ME 332 [C] or ME 332H [C] or NE 332 [C] or NE 332H [C])

ME 444. THERMAL SYSTEMS DESIGN AND ANALYSIS. (4 Credits)
Integration of the concepts, laws, and methodologies from fluid mechanics, heat transfer, and thermodynamics, into a set of practical tools for thermal energy systems design and analysis.
Prerequisites: (ME 332 with C or better or ME 332H with C or better or NSE 332 with C or better or NSE 332H with C or better) and (ME 312 (may be taken concurrently) [C] or ME 312H (may be taken concurrently) [C] or NSE 312 (may be taken concurrently) [C] or NSE 312H (may be taken concurrently) [C])

ME 445. INTRODUCTION TO COMBUSTION. (4 Credits)
Study of combustion science based on the background of chemistry, thermodynamics, fluid mechanics, heat and mass transfer. Stoichiometry, energetics of chemical reactions, flame temperature, equilibrium product analyses, chemical kinetics, and chain reactions.
Prerequisites: (ME 312 with C or better or ME 312H with C or better) and (ME 332 [C] or ME 332H [C])

ME 450. APPLIED HEAT TRANSFER. (4 Credits)
An intermediate heat transfer course seeking to lay a foundation for determining the heating and cooling characteristics with a variety of modern and classical processes. Included is design of multi-component heat transfer systems. Lecture, 110 minutes twice per week. Prerequisites: ME 332 with C or better or ME 332H with C or better

ME 451. INTRODUCTION TO INSTRUMENTATION AND MEASUREMENT SYSTEMS. (4 Credits)
Function, operation, and application of common mechanical engineering instruments, measurement principles, and statistical analysis. Major elements of measurement systems, including transduction, signal conditioning, and data recording. Function and operation of digital data acquisition systems. Lec/lab.
Prerequisites: (ENGR 202 with C or better or ENGR 202H with C or better and (ME 311 [C] or ME 311H [C]) and ME 316 [C] and (ME 317 [C] or ME 317H [C]) and (ME 373 [C] or ME 373H [C]) and (ST 314 [C] or ST 314H [C])
Equivalent to: ME 351
ME 452. THERMAL AND FLUIDS SCIENCES LABORATORY. (4 Credits)
Course emphasis is on experiments related to thermodynamics, heat transfer, and fluid mechanics. Proper experimental methods, data and uncertainty analysis related to thermal and fluids measurements are discussed.
Prerequisites: (ME 311 with C or better or ME 311H with C or better) and (ME 331 [C] or ME 331H [C]) and (ME 332 [C] or ME 332H [C])
Equivalent to: ME 452H

ME 452H. THERMAL AND FLUIDS SCIENCES LABORATORY. (4 Credits)
Course emphasis is on experiments related to thermodynamics, heat transfer, and fluid mechanics. Proper experimental methods, data and uncertainty analysis related to thermal and fluids measurements are discussed.

Attributes: HNRS – Honors Course Designator
Prerequisites: (ME 311 with C or better or ME 311H with C or better) and (ME 331 [C] or ME 331H [C]) and (ME 332 [C] or ME 332H [C])
Equivalent to: ME 452

ME 453. STRUCTURE AND MECHANICS LABORATORY. (4 Credits)
Techniques for measurement of structural response and material properties. Proper use of rosette strain gauges, load cells, and displacement transducers. Full-field strain measurement using photoelasticity and digital image correlation. Proper implementation of material testing standards. Characterization of anisotropic composite materials.
Prerequisites: ME 451 with C or better

ME 460. INTERMEDIATE FLUID MECHANICS. (4 Credits)
Ideal fluid flow including potential flow theory. Introduction to compressible flow. Viscous flow and boundary layer theory. Introduction to turbulence.
Prerequisites: ME 331 with C or better or ME 331H with C or better

ME 461. GAS DYNAMICS. (4 Credits)
Studies one-dimensional isentropic flow, nozzles, diffusers, normal and oblique shocks, compressible flow with friction and heating, and an introduction to propulsion systems.
Prerequisites: (ME 312 with C or better or ME 312H with C or better) and (ME 331 [C] or ME 331H [C])

ME 480. MATERIALS SELECTION. (3 Credits)
Selecting materials for engineering applications. The major families of materials, their properties, and how their properties are controlled; case studies and design projects emphasizing materials selection.
Prerequisites: MATS 322 with C or better or ENGR 322 with C or better

ME 484. FRACTURE OF MATERIALS. (3 Credits)
Fracture mechanics and fatigue mechanisms: mechanisms of ductile and brittle fracture. Environmentally induced fracture and fatigue. Considerations in design of engineering materials and structures will be discussed.
Prerequisites: MATS 322 with C or better or ENGR 322 with C or better

ME 499. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: ME 499H
This course is repeatable for 16 credits.

ME 499H. SPECIAL TOPICS. (0-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: ME 499
This course is repeatable for 16 credits.

ME 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ME 502. INDEPENDENT STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

ME 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ME 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ME 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ME 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ME 508. THERMAL FLUID SCIENCE SEMINAR. (1 Credit)
Student participation seminar experience for 1 course credit. Students will present and listen to seminars concerning ongoing research within the thermal fluid sciences.

ME 509. MATERIALS SCIENCE SEMINAR. (1 Credit)
Student participation seminar experience for one credit; students will listen to seminars concerning ongoing research activities within materials science. Students will also have the opportunity to present their own research results periodically. Graded P/N.
Equivalent to: MATS 509

ME 511. PRECISION MACHINE DESIGN. (3 Credits)
Tolerance analysis and application in design/manufacturing practice, principles of machine design and computational analysis of errors in machine design, sensor mounting and sensor calibration, machine level error budget with geometric and thermal errors, structural design of joints and supports, deterministic damping, exact constraint design for flexures and couplings, bearing systems design, motion and power system design for machine tools. CROSSLISTED as ME 511/MFGE 511.
Equivalent to: MFGE 511
Recommended: An understanding of mechanical component design and solid mechanics.

ME 512. DESIGN OF MECHANISMS. (4 Credits)
Analysis and study of the function, classification, position, velocity, and acceleration of multi-element mechanical linkages and mechanisms. Synthesis of mechanisms for specified multiple point paths, quick return, dwell, and straight-line motion. The lecture will instruct students in the kinematic analysis and synthesis of mechanisms through the use of theory and software packages. The laboratory will familiarize students with a modern mechanism design and animation software package. Lec/lab.
Recommended: (ME 317 or ME 317H) and ME 383

ME 513. BIO-INSPIRED DESIGN. (4 Credits)
Intersection of design and biology that seeks to systematically mine biological knowledge to solve design problems. Investigates inspiration from nature from three different types: visual, conceptual, and computational. Includes design rules, heuristics, principles or patterns to solve engineering problems. Algorithmic bio-inspiration emulates natural algorithms for control or optimization problems.

ME 515. RISK AND RELIABILITY ANALYSIS IN ENGINEERING DESIGN. (4 Credits)
Fundamentals of risk, uncertainty, and reliability. Methods to analyze and quantify the risk of failures, and the reliability of complex systems, including fault tree analysis, reliability block diagrams, probabilistic risk assessment. Introduction to research methods for risk and reliability analysis during the early design stages.
ME 516. MODELING AND ANALYSIS OF COMPLEX SYSTEMS. (4 Credits)
Introduction to challenges and considerations when designing complex systems. Fundamentals of systems engineering and methods used in practice. Models and tools used to enable the use of models for trade studies during the design of complex systems. Model-based design environments and methodologies. Introduction to decision support tools in design.

ME 517. OPTIMIZATION IN DESIGN. (4 Credits)
Optimization methods as applied to engineering design, theory and application of nonlinear optimization techniques for multivariate unconstrained and constrained problems. Model boundedness and sensitivity.

ME 519. SELECTED TOPICS IN DESIGN. (3-4 Credits)
Topics in mechanical design selected from the following: design processes, quality engineering, design for assembly, statistical machine design, the Tagucchi method, and parametric design.
This course is repeatable for 32 credits.

ME 520. APPLIED STRESS ANALYSIS. (4 Credits)
Elasticity theory, failure theories, energy methods, finite element analysis.
Recommended: ME 316

ME 521. LINEAR ELASTICITY. (4 Credits)
A general introduction to the theory of elasticity. The solution of 2-D problems using the Airy stress function in rectangular and polar coordinates. The solution of 3-D problems using the Galerkin vector, the Papkovitch-Neuber solution, and complex variable methods. Applications to asymptotic fields at discontinuities, contact and crack problems, and thermoelasticity.
Recommended: ME 316

ME 522. MECHANICAL VIBRATIONS. (4 Credits)
Dynamic response of single and multiple degree-of-freedom systems.
Recommended: ME 317

ME 523. ADVANCED STRESS ANALYSIS. (4 Credits)
An introduction to the mechanics of nonlinear elastic, plastic, and viscoelastic material behavior including large deformations.
Recommended: ME 316

ME 524.FINITE ELEMENT MODELING OF MECHANICAL ENGINEERING SYSTEMS. (3 Credits)
Application of modern finite element code in the analysis of complex mechanical engineering systems. Extensive use of engineering workstations. Lec/lab.
Prerequisites: ME 520 with C or better

ME 526. NUMERICAL METHODS FOR ENGINEERING ANALYSIS. (3 Credits)
Equivalent to: NE 526, NSE 526
Recommended: Programming experience and previous exposure to numerical methods

ME 529. SELECTED TOPICS IN SOLID MECHANICS. (3-4 Credits)
Advanced topics in solid mechanics emphasizing research applications of current interest.
This course is repeatable for 32 credits.

ME 531. LINEAR MULTIVARIABLE CONTROL SYSTEMS I. (4 Credits)
Theoretical design of control systems for systems modeled by linear multivariable differential equations. Topics covered include controllability, observability, state feedback control, pole placement, output feedback, estimator design, and control designs that include both estimators and regulators.

ME 532. LINEAR MULTIVARIABLE CONTROL SYSTEMS II. (4 Credits)
Focuses on designing control systems where the device to be controlled is an uncertain system, yet can be described by a set of linear differential equations. Lec.
Prerequisites: ME 531 with C or better

ME 533. NONLINEAR DYNAMIC ANALYSIS. (4 Credits)
Course focuses on understanding the behavior of nonlinear dynamic systems of interest to mechanical engineers. Lec.
Recommended: ME 317

ME 534. NONLINEAR MULTIVARIABLE CONTROL SYSTEMS. (4 Credits)
Focuses on designing control systems when the device to be controlled is mathematically described by a nonlinear set of differential equations. Lec.
Prerequisites: ME 533 with C or better

ME 539. SELECTED TOPICS IN DYNAMICS. (1-16 Credits)
Advanced topics in dynamics emphasizing research applications of current interest.
This course is repeatable for 30 credits.

ME 540. INTERMEDIATE THERMODYNAMICS. (4 Credits)
Students are expected to master classical thermodynamics by way of solving extended problems using software tools. Statistical thermodynamics concepts are also introduced and exercised.
Recommended: ME 312

ME 541. LIQUID-VAPOR PHASE CHANGE AND HEAT TRANSFER. (4 Credits)
Advanced treatment of underlying physics and engineering modeling approaches for heat transfer associated with vapor/liquid phase change processes. Topics include thermodynamics and mechanical aspects of phase change processes, pool boiling, filmwise and dropwise condensation, internal convective boiling and condensation, and other emerging areas in phase change heat transfer.

ME 543. RENEWABLE ENERGY: THERMAL FLUID SYSTEMS. (4 Credits)
Evaluates several thermal/fluid power conversion strategies that deal with both thermal and fluid energy sources in terms of basic conversion technology, resource potential and developmental challenges. There are four modules, each targeting a particular renewable energy system in thermal and fluid sciences.
Recommended: (ME 311 or ME 311H or ME 311 or NE 311H) and (ME 331 or ME 331H or NE 331 or NE 331H) and (ME 332 or ME 332H or ME 332 or ME 332H)

ME 544. ADVANCED POWER GENERATION SYSTEMS. (4 Credits)
Thermal mechanical evaluation of modern power generation technologies, including fossil and nuclear Rankine cycle power plants, gas turbines, cogeneration power plants, distributed power generation and fuel cells. Lec/rec.
Recommended: ME 312 and (ME 332 or ME 332H)

ME 545. INTRODUCTION TO COMBUSTION. (4 Credits)
Study of combustion science based on the background of chemistry, thermodynamics, fluid mechanics, heat and mass transfer. Stoichiometry, energetics of chemical reactions, flame temperature, equilibrium product analyses, chemical kinetics, and chain reactions.
Recommended: ME 312 and (ME 332 or ME 332H)

ME 546. CONVECTION HEAT TRANSFER. (3 Credits)
An advanced treatment of forced and natural convection heat transfer processes emphasizing underlying physical phenomena. Current topical literature will be considered; analytical and numerical problem solving is included.
Recommended: (ME 332 or ME 332H) and ME 373
ME 547. CONDUCTIVE HEAT TRANSFER. (3 Credits)
Analytical and numerical solutions to steady state and transient conduction problems.
Recommended: (ME 332 or ME 332H) and ME 373

ME 548. RADIATION HEAT TRANSFER. (3 Credits)
Analytical and numerical methods of solution of thermal radiation problems.
Recommended: (ME 332 or ME 332H) and ME 373

ME 549. SELECTED TOPICS IN HEAT TRANSFER. (3 Credits)
Topics in heat transfer including advanced problems in conduction, radiation, and convection. Additional examination of heat transfer in multiphase systems, inverse problems, combined modes, equipment design, solution techniques and other topics of current interest considered, including extensive use of current literature. Not all topics covered each year.
This course is repeatable for 9 credits.

ME 550. APPLIED HEAT TRANSFER. (4 Credits)
An intermediate heat transfer course seeking to lay a foundation for determining the heating and cooling characteristics with a variety of modern and classical processes. Included is design of multi-component heat transfer systems. Lecture, 110 minutes twice per week.
Recommended: ME 332 or ME 332H

ME 552. MEASUREMENTS IN FLUID MECHANICS AND HEAT TRANSFER. (4 Credits)
Course emphasis is on measurement techniques and data analysis methods related to fluid mechanics and heat transfer. Proper experimental methods, data and uncertainty analyses related to thermal and fluids measurements are discussed. Local and spatial mapping of fluid and thermal fields are highlighted.
Recommended: (ME 331 or ME 331H) and (ME 332 or ME 332H) and ME 451

ME 553. STRUCTURE AND MECHANICS LABORATORY. (4 Credits)
Techniques for measurement of structural response and material properties. Proper use of rosette strain gauges, load cells, and displacement transducers. Full-field strain measurement using photoelasticity and digital image correlation. Proper implementation of material testing standards. Characterization of anisotropic composite materials.
Recommended: ME 451

ME 560. INTERMEDIATE FLUID MECHANICS. (4 Credits)
Ideal fluid flow including potential flow theory. Introduction to compressible flow. Viscous flow and boundary layer theory. Introduction to turbulence.
Recommended: ME 331

ME 561. GAS DYNAMICS. (4 Credits)
Studies one-dimensional isentropic flow, nozzles, diffusers, normal and oblique shocks, compressible flow with friction and heating, and an introduction to propulsion systems.
Recommended: ME 312 and (ME 331 or ME 331H)

ME 564. TURBULENCE MODELING. (3 Credits)
An introductory course on theory of different turbulence modeling techniques such as Reynolds Averaged Navier Stokes (RANS), Large Eddy Simulation (LES), and Direct Numerical Simulation (DNS) applied to a range of turbulent flows including free shear flows, boundary layers, and internal flows.
Prerequisites: ME 560 with C or better and (ME 565 [C] or ME 566 [C])

ME 565. INCOMPRESSIBLE FLUID MECHANICS. (3 Credits)
Generalized fluid mechanics; kinematics; methods of description, geometry of the vector field, dynamics of nonviscous fluids, potential motion, two-dimensional potential flow with vorticity.

ME 566. VISCOUS FLOW. (3 Credits)
Boundary layer, stability, transition prediction methods, computational methods in fluid mechanics, recent developments.

ME 567. ENGINEERING APPLICATIONS OF COMPUTATIONAL FLUID DYNAMICS. (4 Credits)
Basic concepts of computational fluid dynamics, a technique used for solving fully three-dimensional fluid flow problems with no exact solution, will be discussed and applied to general engineering applications using commercially available software. Lec.
Recommended: ME 312 and (ME 331 or ME 331H)

ME 568. TURBULENT FLOW DYNAMICS. (4 Credits)
An introductory course of the basic physics of turbulent flows, coverage will include statistical methods and physical interpretation of a range of flows including boundary layer flows, internal flows, and environmental flows.
Prerequisites: ME 560 with C or better
Recommended: A first course in fluid mechanics such as ME 331

ME 569. SELECTED TOPICS IN FLUID MECHANICS. (2-4 Credits)
Topics in fluid mechanics emphasizing research applications of current interest.
This course is repeatable for 32 credits.

ME 580. MATERIALS SELECTION. (3 Credits)
Selecting materials for engineering applications. The major families of materials, their properties, and how their properties are controlled; case studies and design projects emphasizing materials selection. Lec/lab.
Equivalent to: MATS 580
Recommended: MATS 322 or ENGR 322

ME 583. COMPOSITE MATERIALS. (3 Credits)
Fibers and matrices, mechanics of composites, reinforcement and failure mechanisms, properties and applications. Lec/lab.
Recommended: MATS 322 or ENGR 322

ME 585. FATIGUE OF MATERIALS. (4 Credits)
Analyzes the failure of materials by fatigue including how fatigue behavior is characterized, how fatigue failure is predicted, the physical mechanisms responsible for fatigue failure of various materials, and how such behavior is related to the atomic structure and microstructure of the material.
Prerequisites: ME 570 with C or better or MATS 570 with C or better

ME 589. SELECTED TOPICS IN MATERIALS. (3 Credits)
Topics in materials science to correspond to areas of graduate research. Topics will be chosen from the following list: optical materials, dielectrics, oxidation and corrosion, ceramics, thermophysical properties, polymers and viscoelasticity, coatings and thin films. Lec/rec.
This course is repeatable for 32 credits.

ME 596. SELECTED TOPICS IN THERMODYNAMICS. (3 Credits)
Topics in thermodynamics including advanced problems in classical thermodynamics and statistical thermodynamics of current interest. Topics will likely be considered, including extensive use of literature. Not all topics covered each year.
This course is repeatable for 32 credits.
ME 597. PRECISION MOTION GENERATION. (4 Credits)
Introduces fundamental knowledge in mechatronic systems used in manufacturing equipment such as CNC machine tools, and their computer numerical controls. Students will be exposed to sensors and actuators utilized in machine tools, industrial robots and for process automation. Fundamental knowledge to model and identify dynamics of motion delivery systems, design and analysis of accurate position control algorithms for precision motion generation will be covered. Digital motion control design will be introduced. Motion planning and real-time path interpolation algorithms will be covered. Students will be able to design NC systems for 2D motion platforms.
Recommended: ME 430

ME 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 32 credits.

ME 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ME 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ME 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ME 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

ME 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

ME 611. MODERN PRODUCT DESIGN. (4 Credits)
Modern product development, design and prototyping are covered. Product development and prototyping is examined from a research standpoint in this course. Customer outcomes gathering, functional modeling, product architecture, modern techniques for concept generation and selection are explored. Also covered are recently developed theories and techniques for prototyping. The topics' place in the overall design process is shown through a product development and prototyping project.

ME 613. SUSTAINABLE PRODUCT DESIGN. (4 Credits)
Graduate students will work in multidisciplinary design teams to develop innovative and environmentally friendly products. Combining the principles of integrated product development and sustainable design thinking, students will (a) advance their knowledge of the design process by creating a patent-quality new product, (b) learn and employ environmentally-minded design theory and methods, including various software packages and online tools, and (c) further enhance teamwork skills by working collaboratively in a professional design team. Sustainable Product Development is conducted as a collaborative design experience, in that lectures, discussion, and team working time will be integrated into class sessions.

ME 615. DESIGN UNDER UNCERTAINTY. (4 Credits)
Tackles the problem of decision making in engineering design. The fundamental challenge faced in making decisions in engineering designs is that they are almost exclusively decisions made under uncertainty. Sources of uncertainty could result from engineering models, experiments conducted, or lack of knowledge of future events. The course will cover three basic topics 1) how do we quantify uncertainty, 2) how do we account for the uncertainty in decision making, and 3) how do we make design selection decisions about products or systems we design.
Prerequisites: ME 517 with C or better

ME 617. DESIGN AUTOMATION. (4 Credits)
Design automation is the field of study whereby advanced numerical methods are used to automate difficult or tedious design decisions. Typically, such methods are based on numerical optimization and artificial intelligence. They work in tandem with other engineering digital tools like computer-aided design, computer-aided manufacturing, and finite-element analysis. This course builds upon a fundamental understanding of optimization to introduce students to a range of different techniques that may be used to support engineering decision-making. This includes heuristic methods, AI tree-search, discrete and stochastic algorithms. The course concludes with discussion of recent innovations in multi-objective, multi-disciplinary and robust optimization.
Prerequisites: ME 517 with C or better

ME 667. COMPUTATIONAL FLUID DYNAMICS. (3 Credits)
Application of modern computational techniques to solve a wide variety of fluid dynamics problems including both potential and viscous flow with requirements for computer code development.
Prerequisites: (ME 560 with C or better or ME 565 with C or better or ME 566 with C or better) and (ME 526 [C] or ME 575 [C])

Microbiology (MB)

MB 110. ORIENTATION TO MICROBIOLOGY. (1 Credit)
Introduction of incoming microbiology students to college life with an emphasis on faculties, facilities, services, and curricula in microbiology. Exposure to career opportunities in microbiology. Graded P/N.

MB 201. LABORATORY SKILLS. (1-16 Credits)
These credits are designed for students who are doing experiential learning in a research laboratory on campus, performing basic laboratory tasks that are not elevated to the level of an independent research project. Graded P/N.
This course is repeatable for 16 credits.

MB 230. *INTRODUCTORY MICROBIOLOGY. (4 Credits)
Microbiology as it affects our everyday lives. The impact of microorganisms on health, food/water sanitation, environment, industry, and genetic engineering. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: MB 230H

MB 230H. *INTRODUCTORY MICROBIOLOGY. (4 Credits)
Microbiology as it affects our everyday lives. The impact of microorganisms on health, food/water sanitation, environment, industry, and genetic engineering. Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science; HNRS – Honors Course
Designator
Equivalent to: MB 230

MB 255. *ALLIED HEALTH MICROBIOLOGY. (4 Credits)
General properties of cellular microbes and viruses, microbial biochemistry and genetics, pathogenesis and disease, immunity, and microbial infections. Lecture and lab emphasis is on medical microbiology, infectious diseases, and public health. Not intended for biological sciences majors. Lec/lab. CROSSLISTED as HBS 255/MB 255.
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: BHS 255
MB 290. SUCCESS IN MICROBIOLOGY. (1 Credit)
Science skills, science literacy, ethics, and professional development to build a successful career in Microbiology. Learn the process of research, access and analyze primary literature, evaluate user-generated science content, practice professional skills, and identify plan for experience-building opportunities such as jobs, research and internships. Sophomore standing or higher.

MB 299. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies.
Equivalent to: MB 299H
This course is repeatable for 16 credits.

MB 299H. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: MB 299
This course is repeatable for 16 credits.

MB 302. GENERAL MICROBIOLOGY. (3 Credits)
Emphasis on cytology, physiology, virology, growth and control of growth with coverage of the role of microorganisms in nature, in disease, and as useful tools.
Prerequisites: (CH 332 with C- or better or CH 335 with C- or better) and (((BI 212 with C- or better or BI 212H with C- or better) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]))

MB 303. GENERAL MICROBIOLOGY LABORATORY. (2 Credits)
Development of laboratory techniques; exercises designed to reinforce concepts covered in MB 302. MB 302 is a prereq that may be taken prior to or concurrently with MB 303. Lec/lab.
Prerequisites: MB 302 (may be taken concurrently) with D- or better
Equivalent to: MB 303H
Recommended: Two terms organic chemistry

MB 310. BACTERIAL MOLECULAR GENETICS. (3 Credits)
Introductory concepts of bacterial molecular genetics. Topics include DNA replication, mutation, DNA repair, DNA recombination, transposons, bacteriophages, genetic manipulation, and gene regulation.
Prerequisites: MB 302 with D- or better and (BB 314 [D-] or BB 314H [D-]) and (BB 450 [D-] or BB 490 [D-]) and (BB 451 (may be taken concurrently) [D-] or BB 491 (may be taken concurrently) [D-])
Equivalent to: MB 306

MB 311. *MOLECULAR MICROBIOLOGY LAB: A WRITING INTENSIVE COURSE. (3 Credits)
Scientific writing, laboratory notebook composition, experimental design, and laboratory experiments in bacterial molecular biology. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 310 (may be taken concurrently) [D-]
Equivalent to: MB 307

MB 312. BACTERIAL PHYSIOLOGY AND METABOLISM. (3 Credits)
Molecular structure and function, macromolecular assembly, energy production and use, and cellular growth.
Prerequisites: MB 310 with D- or better and BB 451 [D-]
Equivalent to: MB 304
Recommended: BB 450

MB 314. AQUATIC MICROBIOLOGY. (3 Credits)
A survey of the diversity, ecology, and physiology of microbes in aquatic systems, with emphasis on their roles in food webs, chemical cycling, and human health. Provides the background knowledge and quantitative/analytical skills necessary to interpret and critique current and historical research in the fields of general aquatic microbiology.
Prerequisites: (CH 231 with D- or better or CH 231H with D- or better or CH 121 with D- or better) and (CH 232 [D-] or CH 232H [D-] or CH 122 [D-]) and (CH 233 [D-] or CH 233H [D-] or CH 123 [D-])

MB 320. HUMAN BACTERIOLOGY. (4 Credits)
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or ((BI 211 [C-] or BI 211H [C-]) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]))
Equivalent to: BHS 320

MB 330. *DISEASE AND SOCIETY. (3 Credits)
Infectious disease has many effects on the development of society, and likewise, human interactions affect the development of disease. The course examines these interactions with a focus on the role of race, class, and economic status in the development of epidemics. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

MB 340. HUMAN VIROLOGY. (4 Credits)
Prerequisites: (BI 204 with C- or better and BI 205 [C-] and BI 206 [C-]) or (BI 211 [C-] and BI 212 [C-] and BI 213 [C-])
Equivalent to: BHS 340

MB 385. *EMERGING INFECTIOUS DISEASES AND EPIDEMICS. (3 Credits)
Emerging and reemerging infectious disease is a contemporary global issue of great concern. To understand and evaluate the issue, the course covers germ theory, disease history and ecology, microbial pathogenesis and the immune response, historic plagues, and the biological, environmental, population and social changes that contribute to disease emergence. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: (BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-]) and (BI 213 [D-] or BI 213H [D-])
Equivalent to: BI 385

MB 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: MB 399H
This course is repeatable for 16 credits.

MB 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: MB 399
This course is repeatable for 16 credits.

MB 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MB 403. THESIS. (1-16 Credits)
Conference. Instruction in microbiology.
This course is repeatable for 16 credits.
MB 406. SPECIAL PROJECTS. (1-16 Credits)
Reading and Conference/instructor in Microbiology.
This course is repeatable for 16 credits.

MB 407. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

MB 410. OCCUPATIONAL INTERNSHIP. (1-10 Credits)
Supervised work experience at selected cooperating institutions, agencies, laboratories, clinics or companies. Maximum of 10 credits allowed but no more than 3 credits may be used to satisfy microbiology major requirement of 36 credits. Graded P/N.
This course is repeatable for 10 credits.

MB 416. IMMUNOLOGY. (3 Credits)
Basic theory and applications of immunochemistry, immunogenetics, and cellular immunology. Examination of immunologically related diseases.
Prerequisites: BB 450 with D- or better or BB 490 with D- or better

MB 417. IMMUNOLOGY LABORATORY. (2 Credits)
Laboratory on the applications of current immunological techniques.
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 416 (may be taken concurrently) [D-]

MB 420. MICROBIAL GENOMES, BIOGEOCHEMISTRY, AND DIVERSITY. (3 Credits)
A survey of microbial diversity from the earliest life forms to the modern role of bacteria and archaea in global biogeochemical cycles. Topics covered include molecular evolution, microbial genomics, biochemical diversity, and metabolic pathways that adapt cells to extreme environments. Particular emphasis is placed on marine systems, from photosynthesis in surface waters to life in the ocean crust.
Prerequisites: BB 451 with D- or better

MB 422. AQUATIC MICROBIOLOGY LABORATORY. (2 Credits)
Laboratory analyzing field samples from freshwater and marine systems to examine patterns of microbiological communities.
Prerequisites: MB 303 with D- or better and MB 314 [D-]

MB 430. BACTERIAL PATHOGENESIS. (3 Credits)
Bacteria pathogenic for humans, emphasizing the structural, physiological and genetic mechanisms of pathogenesis. Role of the immune system in pathogenesis and protection.
Prerequisites: MB 302 with D- or better and MB 310 [D-] and (BB 451 [D-] or BB 491 [D-])

MB 434. Virology. (3 Credits)
Properties of viruses, their biology and pathogenesis. Emphasis on viruses causing human disease.
Prerequisites: (BB 450 with D- or better or BB 450H with D- or better) and (BB 451 [D-] or BB 451H [D-]) or (BB 490 [D-] and BB 491 [D-] and BB 492 [D-])

MB 435. PATHOGENIC MICROBES LABORATORY. (2 Credits)
Laboratory experiments to illustrate concepts presented in MB 430 and/or MB 434, focusing on pathogenic microorganisms.
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 302 [D-] and (MB 430 (may be taken concurrently) [D-] or MB 434 (may be taken concurrently) [D-])

MB 436. THE HUMAN MICROBIOME. (3 Credits)
Examines the biodiversity, function, and medical importance of the communities of microorganisms that inhabit the human body. A diverse array of topics will be discussed, including how the human microbiome is studied, case studies of specific aspects of the human microbiome, and emerging theories of how the microbiome influences human health.
Prerequisites: BI 314 with D- or better or BB 314 with D- or better or BI 314H with D- or better or MB 302 with D- or better

MB 440. FOOD MICROBIOLOGY. (3 Credits)
Role of microorganisms in food spoilage, infection, and intoxication; also basic principles in contamination control and germicidal treatment during processing, preparing, and distributing food for consumption.
Prerequisites: MB 302 with D- or better

MB 441. FOOD MICROBIOLOGY LABORATORY. (2 Credits)
Laboratory techniques to accompany MB 440/MB 540.
Prerequisites: (MB 303 with D- or better or MB 303H with D- or better) and MB 440 (may be taken concurrently) [D-]
Recommended: MB 302

MB 448. MICROBIAL ECOLOGY. (3 Credits)
A comparison of soil sediments and freshwater as microbial habitats. Discussion of the role of microorganisms in nutrient cycles, effects of microbial activity on plant and animal life.
Prerequisites: MB 302 with D- or better

MB 456. MICROBIOLOGICAL GENETICS AND BIOTECHNOLOGY. (3 Credits)
General biology of natural, genetically engineered, and composite plasmids. Major topics include extrachromosomal DNA replication, plasmid transmission, insertion elements, transposons, gene expression, and recombinant DNA vectors. Biotechnological applications and molecular genetic tools are emphasized.
Prerequisites: MB 302 with D- or better and (BB 450 [D-] or BB 490 [D-]) and (BB 451 [D-] or BB 491 [D-]) and (MB 310 [D-] or BB 492 [D-])

MB 479. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSLISTED as FST 479/MB 479 and FST 579/MB 579.
Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-] and (BB 350 [D-] or BB 450 [D-]) and MB 302 [D-]
Equivalent to: FST 479

MB 480. GENERAL PARASITOLOGY. (3 Credits)
Introduction to parasitology. The course emphasizes medical parasitology, but will cover a broad overview of parasitology, covering important groups and host/parasite relationships among all taxa from invertebrates to vertebrates, including mammals.
Recommended: BI 314 or BB 450 or Z 361 or MB 302

MB 490. MICROBIOLOGY CAPSTONE EXPERIENCE. (2 Credits)
Capstone experience for microbiology students to practice professional skills necessary to sustain a career in science. Students will work in teams to analyze research data and communicate this analysis, in addition to explore career opportunities and learn how to successfully compete for jobs. Graded P/N.
Prerequisites: MB 302 with D- or better
MB 491. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSTOLED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: FW 491
Recommended: 9 credits of upper-division fisheries or biology.

MB 496. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSTOLED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: FW 496
Recommended: MB 303 or other upper-division laboratory course.

MB 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: One term of biology

MB 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MB 503. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

MB 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MB 507. SEMINAR. (1 Credit)
Graded P/N.
This course is repeatable for 99 credits.

MB 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

MB 511. SCIENTIFIC SKILLS. (1 Credit)
Foundational skills for success in graduate school. Students will also become familiar with ongoing research programs in three active programs in the Microbiology Program.

MB 512. HIGHLIGHTS OF MICROBIOLOGY. (1 Credit)
Designed for students to gain familiarity with the history of microbiology through reading, reviewing and writing about great papers in the field. Students also meet the Microbiology Program faculty and students, and learn about some of the research in the Microbiology Program through attending colloquium.

MB 513. MICROBIAL SYSTEMS. (3 Credits)
Presentation of a modern view of microbiology through the lens of microbes’ influences on our planet’s habitats and inhabitants. Discusses current research and the use of advanced techniques to illustrate how microbiology is contributing to many cross-disciplinary problems that can involve engineering, public health, sociology, ecology, geology, etc.

MB 516. IMMUNOLOGY. (3 Credits)
Basic theory and applications of immunoochemistry, immunogenetics, and cellular immunology. Examination of immunologically related diseases.
Recommended: BB 450 or BB 490

MB 517. IMMUNOLOGY LABORATORY. (2 Credits)
Laboratory on the applications of current immunological techniques.
Recommended: (MB 303 or MB 303H) and completion or concurrent enrollment in MB 516

MB 520. MICROBIAL GENOMES, BIOGEOCHEMISTRY, AND DIVERSITY. (3 Credits)
A survey of microbial diversity from the earliest lifeforms to the modern role of bacteria and archaea in global biogeochemical cycles. Topics covered include molecular evolution, microbial genomics, biochemical diversity, and metabolic pathways that adapt cells to extreme environments. Particular emphasis is placed on marine systems, from photosynthesis in surface waters to life in the ocean crust.
Recommended: BB 451 or BB 551

MB 530. BACTERIAL PATHOGENESIS. (3 Credits)
Bacteria pathogenic for humans, emphasizing the structural, physiological and genetic mechanisms of pathogenesis. Role of the immune system in pathogenesis and protection.
Recommended: MB 302 and MB 310 and (BB 451 or BB 491)

MB 534. VIROLOGY. (3 Credits)
Properties of viruses, their biology and pathogenesis. Emphasis on viruses causing human disease.
Recommended: ((BB 450 or BB 450H) and (BB 451 or BB 451H)) or (BB 490 and BB 491 and BB 492)

MB 540. FOOD MICROBIOLOGY. (3 Credits)
Role of microorganisms in food spoilage, infection, and intoxication; also basic principles in contamination control and germicidal treatment during processing, preparing, and distributing food for consumption.
Recommended: MB 302

MB 541. FOOD MICROBIOLOGY LABORATORY. (2 Credits)
Laboratory techniques to accompany MB 440/MB 540.
Prerequisites: MB 540 (may be taken concurrently) with C or better
Recommended: MB 302 and MB 303

MB 548. MICROBIAL ECOLOGY. (3 Credits)
A comparison of soil sediments and freshwater as microbial habitats. Discussion of the role of microorganisms in nutrient cycles, effects of microbial activity on plant and animal life.
Recommended: MB 302

MB 555. BIOLOGY OF THE PROKARYOTES. (3 Credits)
An integrative graduate course examining bacterial and archaeal life at different levels of biological organization, emphasizing current research and analysis of primary literature. The various life styles of prokaryotes are the common theme of the course. Topics include biofilms, cooperation and communication, development, stress responses, metabolic interactions involved in global nutrient cycling. Offered every even year in winter term.
Recommended: BB 450 and MB 310 and MB 312

MB 556. MICROBIAL GENETICS AND BIOTECHNOLOGY. (3 Credits)
General biology of natural, genetically engineered, and composite plasmids. Major topics include extrachromosomal DNA replication, plasmid transmission, insertion elements, transposons, gene expression, and recombinant DNA vectors. Biotechnological applications and molecular genetic tools are emphasized.
Recommended: MB 302 and (BB 450 or BB 490) and (BB 451 or BB 491) and (MB 310 or BB 492)
MB 579. FERMENTATION MICROBIOLOGY. (3 Credits)
An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSLISTED as FST 479/MB 479 and FST 579/MB 579.
Equivalent to: FST 579
Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and (BB 350 or BB 450) and MB 302

MB 580. GENERAL PARASITOLOGY. (3 Credits)
Introduction to parasitology. The course emphasizes medical parasitology, but will cover a broad overview of parasitology, covering important groups and host/parasite relationships among all taxa from invertebrates to vertebrates, including mammals.
Recommended: Bi 314 or BB 450 or Z 361 or MB 302

MB 591. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE. (3 Credits)
Introduction to diseases of fish including pathogens important to aquaculture and ornamental industries as well as to wild fish populations and conservation programs. CROSSLISTED as FW 491/MB 491 and FW 591/MB 591.
Equivalent to: FW 591
Recommended: 9 credits of upper-division fisheries or biology.

MB 596. FISH DISEASES IN CONSERVATION BIOLOGY AND AQUACULTURE LAB. (2 Credits)
This laboratory complements lectures in FW/MB 491/591, with students learning basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods. CROSSLISTED as FW 496/MB 496 and FW 596/MB 596.
Equivalent to: FW 596
Recommended: MB 303 or other upper-division laboratory course.

MB 599. SELECTED TOPICS. (0-6 Credits)
This course is repeatable for 24 credits.

MB 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

MB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

MB 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

MB 607. SEMINAR. (1 Credit)
Graded P/N.
This course is repeatable for 99 credits.

MB 610. INTERNSHIP. (1-9 Credits)
This course is repeatable for 16 credits.

MB 668. MICROBIAL BIOINFORMATICS AND GENOME EVOLUTION. (4 Credits)
Theoretical and practical issues in microbial genome sequencing and annotation, with an emphasis on evolutionary theory and comparative analysis of microbial genome sequences. Metabolic prediction from genomes, with a population genetics perspective comparative microbial genomics. Exploration of applications of genomics and allied tools to microbial populations, including metagenomics, metaproteomics, and metatranscriptomics.
Equivalent to: MCB 668

MB 699. SPECIAL TOPICS. (0-16 Credits)
Lec/lab.
This course is repeatable for 16 credits.

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**Military Science (MS)**

**MS 111. MILITARY SCIENCE I: INTRODUCTION TO ARMY LEADERSHIP AND ROTC. (1 Credit)**
Introduction to ROTC, and its relationship to the U.S. Army. Role of the army officer, including leadership and management fundamentals. Introduction to land navigation. Lec/lab.

**MS 112. MILITARY SCIENCE I: INTRODUCTION TO BASIC MILITARY SKILLS. (1 Credit)**
Basic small unit tactics; land navigation; how to read a topographic map and use a magnetic compass; includes practical exercises. Graded A-F only.

**MS 113. MILITARY SCIENCE I: INTRODUCTION TO TACTICAL LEADERSHIP. (1 Credit)**
Customs and traditions of the U.S. Army; unit organization and missions. Types of careers available to army officers. Practical exercises. Lec/lab.

**MS 130. MILITARY PHYSICAL CONDITIONING. (1 Credit)**
Prepares military science cadets and university students to excel in the Army Physical Fitness Test (APFT). (Bacc Core Course)
Attributes: CSFT – Core, Skills, Fitness
This course is repeatable for 11 credits.

**MS 211. MILITARY SCIENCE II: FOUNDATIONS OF LEADERSHIP I. (2 Credits)**
An examination of effective leadership. Development of interpersonal skills using practical exercises and case studies. Graded A-F only. Lec/lab.

**MS 212. MILITARY SCIENCE II: FUNDAMENTALS OF LEADERSHIP II. (2 Credits)**
History of the American soldier from 1775 to 1919; weaponry and tactics of the American Army. Use of battle analysis and war gaming included.

**MS 213. MILITARY SCIENCE II: FUNDAMENTALS OF MILITARY OPERATIONS. (2 Credits)**
Basic U.S. Army tactics at the individual, team, and squad levels. Integration of military skills in offensive and defensive operations. Graded A-F only. Lec/lab.

**MS 214. MILITARY SCIENCE: LEADER’S TRAINING COURSE (LTC). (6 Credits)**
Four weeks of classroom and field training at Fort Knox, Kentucky. Can substitute for the first two years of the ROTC program.

**MS 311. MILITARY SCIENCE III: LEADERSHIP AND MANAGEMENT OF MILITARY ORGANIZATION. (3 Credits)**
Study of military leadership, management, theory and dynamics of the military team. Applies principles to advanced military operations. Includes leadership, management, and organizational theory; group dynamics; functions of staff organizations; development of the commander’s estimate; combat orders and plans; troop leading procedures; application of leadership concepts in offensive and defensive operations at the squad, platoon, and company level; and fundamentals of small-unit tactics/patrolling. Graded A-F only. Lec/lab.
Molecular & Cellular Biology (MCB)

MCB 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 99 credits.

MCB 503. THESIS. (1-16 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 999 credits.
MCB 555. GENOME EXPRESSION AND REGULATION. (4 Credits)
Prokaryotic and eukaryotic systems will be used to describe recent advances in understanding transcriptional and posttranscriptional control mechanisms. Topics include: microbial, yeast and mouse model systems; transcriptional control mechanisms; RNA processing, silencing and microRNAs; protein synthesis and posttranslational modification; microarray- and mass spectrometry-based expression genomics.
Equivalent to: GEN 555
Recommended: BB 451
MCB 557. SCIENTIFIC SKILLS AND ETHICS. (3 Credits)
Offers instruction, guest lectures and case-study based discussions of ethical issues relevant to scientists on topics such as mentoring, best practices of conducting research, research misconduct and compliance, intellectual property, peer review, ethical use of animal and human subjects and managing conflicts of interest. Training in the preparation and presentation of scientific seminars and grant writing.
MCB 563. CANCER AND CHEMOPREVENTION. (2 Credits)
A summary of mechanisms of cancer progression, how cancer is detected, and introduction to chemoprevention using targeted therapy and alternative medicine.
Recommended: BB 451 and BI 314 and BI 460
MCB 575. COMPARATIVE GENOMICS. (4 Credits)
Equivalent to: BOT 575
Recommended: Basic working knowledge of cell and molecular biology and genetics. BI 314 and (BI 311 or CSS 430)
MCB 576. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)
Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences. CROSSTLISTED as BOT 576/MCB 576.
Equivalent to: BOT 576
Recommended: Cell and molecular biology or genetics and familiarity with text editing software and unix/linux operating system
MCB 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
MCB 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
MCB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
MCB 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
MCB 609. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.
MCB 610. INTERNSHIP. (1-9 Credits)
Laboratory rotation.
This course is repeatable for 16 credits.
MCB 620. DNA FINGERPRINTING. (1 Credit)
Principles and methods for producing and analyzing DNA fingerprints. Offered alternate years. CROSSTLISTED as MCB 620/PBG 620.
Equivalent to: CSS 620, GEN 620, PBG 620
Recommended: BI 311 or CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530
MCB 621. GENETIC MAPPING. (1 Credit)
Principles and methods for constructing genetic maps comprised of molecular and other genetic markers. Offered alternate years. CROSSTLISTED as MCB 621/PBG 621.
Equivalent to: CSS 621, GEN 621, PBG 621
Recommended: BI 311 or CSS 430 or CSS 530 or PBG 430 or PBG 530 or
HORT 430 or HORT 530
MCB 622. MAPPING QUANTITATIVE TRAIT LOCI. (1 Credit)
Principles and methods for mapping genes underlying phenotypically complex traits. Offered alternate years. CROSSTLISTED as MCB 622/ PBG 622.
Equivalent to: CSS 622, GEN 622, PBG 622
Recommended: CSS 590 or ST 513
MCB 637. MOLECULAR HOST-MICROBE INTERACTIONS. (3 Credits)
Lecture and discussion-based presentation of the molecular bases for interactions between organisms. Addresses bacterial, algal, and fungal symbionts of eukaryotes and considers pathogenesis, commensalism, and mutualism. A focus on the evolution of host-microbe interactions is included.
MCB 662. HORMONE ACTION. (3 Credits)
Mechanisms of action of peptide and steroid hormones and related compounds at the cellular level. Offered every other year, winter term. CROSSTLISTED as ANS 662/MCB 662.
Prerequisites: BB 451 with C or better or BB 551 with C or better or BB 492 with C or better or BB 592 with C or better
Equivalent to: PHAR 662
MCB 671. MOLECULAR TOOLS. (3 Credits)
Intended for personnel with some scientific background who are seeking basic- and advanced-level molecular biology knowledge and who wish to become involved with molecular biology-related and biotechnological research. CROSSTLISTED as MCB 671/VMB 671.
Equivalent to: VMB 671
MCB 699. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

Music (MUS)

MUS 101. *MUSIC APPRECIATION I: SURVEY. (3 Credits)
Dealing primarily with the Western classical tradition, the course focuses on developing perceptive listening skills through the study of musical forms and styles. For non-majors. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 101H
MUS 101H. *MUSIC APPRECIATION I: SURVEY. (3 Credits)
Dealing primarily with the Western classical tradition, the course focuses on developing perceptive listening skills through the study of musical forms and styles. For non-majors. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 101
MUS 102. *MUSIC APPRECIATION II: PERIODS AND GENRES. (3 Credits)
A study of the masterworks of a single era (such as Baroque, classic, romantic, twentieth century) or a genre (such as orchestra, chamber, opera, musical theatre). For non-majors. Need not be taken in order. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 102H
This course is repeatable for 12 credits.

MUS 102H. *MUSIC APPRECIATION II: PERIODS AND GENRES. (3 Credits)
A study of the masterworks of a single era (such as Baroque, classic, romantic, twentieth century) or a genre (such as orchestra, chamber, opera, musical theatre). For non-majors. Need not be taken in order. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: MUS 102
This course is repeatable for 12 credits.

MUS 103. *MUSIC APPRECIATION III: GREAT COMPOSERS. (3 Credits)
The life and works of one or more significant composers including Bach, Haydn, Mozart, Beethoven, and others. For non-majors. Does not need to be taken in sequence. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACN – Liberal Arts Non-Western Core
Equivalent to: MUS 103H
This course is repeatable for 18 credits.

MUS 104. SURVEY OF JAZZ. (3 Credits)
Explores the historical, sociological and artistic development of jazz, America’s musical art form. A concise review of the first 100 years of the music from its blues-based roots at the turn of the 20th century to its current eclectic state will constitute the main framework of the course. While the focus will be on the important performers and composers of jazz, key historical and social events that contributed to the evolution of the idiom will also be discussed.

MUS 107. INTRODUCTION TO DIGITAL AUDIO WORKSTATIONS AND PUBLISHING. (3 Credits)
An introduction to project based music composing applications to create original music, remixes and contemporary productions. Students build skills through weekly exercises in both Reaper and MuseScore notation software.
This course is repeatable for 6 credits.

MUS 108. *MUSIC CULTURES OF THE WORLD. (3 Credits)
Survey of the world's music with attention to musical styles and cultural contexts. Included are Oceania, Indonesia, Africa, Asia, Latin America. For non-majors. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: MUS 108H
This course is repeatable for 18 credits.

MUS 108H. *MUSIC CULTURES OF THE WORLD. (3 Credits)
Survey of the world’s music with attention to musical styles and cultural contexts. Included are Oceania, Indonesia, Africa, Asia, Latin America. For non-majors. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: MUS 108
This course is repeatable for 18 credits.

MUS 111. THE FUNDAMENTALS OF MUSIC TECHNOLOGY. (3 Credits)
Covers the principles and approaches used in contemporary music technology. Lectures and demonstrations will be rooted in physics, psychoacoustics, digital and analog recording, various software and hardware platforms, composition, and audio production in order to give students greater context into the creative and technical avenues of the music technologist.

MUS 112. INTRODUCTION TO DIGITAL AUDIO. (3 Credits)
Students will develop a thorough understanding of digital audio in both theory and application. Topics to be explored include common DAW operations, CD authoring, audio for web, sound design, MIDI, songwriting and composition, and digital effects. Course projects will engage students in both technical and creative capacities of digital audio production.
Prerequisites: MUS 111 with C- or better

MUS 113. AUDIO TECHNOLOGIES. (3 Credits)
Students will gain a thorough understanding of the technical and creative potential of various audio equipment used in sound production including microphones, speakers, mixers, recording equipment, effects processors, patch bays, MIDI, and various video equipment. Through discussion and experimentation, students will pursue real-world audio problems in collaborative and individual projects.
Prerequisites: MUS 111 with C- or better

MUS 114. FOUNDATIONS: APPLIED LISTENING AND THEORY. (3 Credits)
A general music foundation series that facilitates students with no prior formal musical background to develop contemporary music literacy using modes of listening including radio, digital music libraries, interactive tutorials and guided listenings and visual mapping.
This course is repeatable for 6 credits.

MUS 121. LITERATURE AND MATERIALS OF MUSIC I. (3 Credits)
Covers fundamentals of music theory along with a brief introduction to Western art music. This requires students to learn to read and write all notes in treble and bass clef, and all common scales, intervals, triads and seventh chords, using key signatures. They also learn to recognize basic rhythms and write them down.
This course is repeatable for 6 credits.

MUS 122. LITERATURE AND MATERIALS OF MUSIC I. (3 Credits)
An integrated, team-taught approach to the study of Western art music, including repertory, melodic, harmonic, and rhythmic components, formal organization, and composition. Recitation included.
Recommended: MUS 121

MUS 123. LITERATURE AND MATERIALS OF MUSIC I. (3 Credits)
An integrated, team-taught approach to the study of Western art music, including repertory, melodic, harmonic, and rhythmic components, formal organization, and composition. Recitation included. Lec/lab/rec.
Recommended: MUS 122

MUS 125. LITERATURE AND MATERIALS LAB I. (1 Credit)
Scales, all major and harmonic form of minor, interval drill.
Equivalent to: MUS 124
Recommended: MUS 121. Concurrent enrollment in MUS 122 for music majors

MUS 126. LITERATURE AND MATERIALS LAB II. (1 Credit)
Transposes scores, harmonic idioms, harmonic progressions. Lec/lab.
Equivalent to: MUS 125
Recommended: MUS 122 and MUS 125. Concurrent enrollment in MUS 123 for music majors
MUS 134. AURAL SKILLS I. (1 Credit)
Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music.
Corequisites: MUS 121

MUS 135. AURAL SKILLS II. (1 Credit)
Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music.
Recommended: Concurrent enrollment with MUS 122

MUS 136. AURAL SKILLS I. (1 Credit)
Aural comprehension of the basic melodic, rhythmic, and harmonic elements of music.
Recommended: MUS 135 and concurrent enrollment in MUS 123

MUS 137. JAZZ IMPROVISATION. (1-3 Credits)
Instrumental and vocal improvisation including composition and arranging techniques.
This course is repeatable for 9 credits.

MUS 140. OSU CHAMBER CHOIR. (1-2 Credits)
A select ensemble of approximately 40 mixed voices. Performances each term. Annual tours. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 146. WOMEN’S CHOIR. (1-2 Credits)
A women's ensemble designed for vocal development and exploration of treble choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 147. MEN’S CHOIR. (1-2 Credits)
A men's ensemble designed for vocal development and exploration of TTBB choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 150. SYMPHONIC BAND. (1 Credit)
A select ensemble of approximately 80 wind and percussion players. Performance each term. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 151. CAMPUS BAND. (1 Credit)
Wind and percussion ensemble of approximately 70 players. Performance each term. Open to all students.
This course is repeatable for 9 credits.

MUS 152. RHYTHM AND BEAVS PEP BAND. (1 Credit)
An auditioned group of 12 musicians who perform at university, community, and athletic events throughout the year.
This course is repeatable for 9 credits.

MUS 153. MARCHING BAND. (1-2 Credits)
A marching and playing unit of more than 160 musicians. Performs for home football games.
This course is repeatable for 6 credits.

MUS 154. BASKETBALL BAND. (1 Credit)
An ensemble of approximately 50 players. Performs for home games.
This course is repeatable for 3 credits.

MUS 155. COLOR GUARD. (1 Credit)
A derivative of the Marching Band Color Guard, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 9 credits.

MUS 156. INDOOR DRUM LINE. (1-2 Credits)
A derivative of the Marching Band Drum Line, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 9 credits.

MUS 157. SMALL JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 158. LARGE JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 160. UNIVERSITY SYMPHONY ORCHESTRA. (1 Credit)
An ensemble of 65-80 players. Performance of orchestral repertoire from the eighteenth, nineteenth, and twentieth centuries. Performance each term. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 162. CHAMBER ENSEMBLE: GUITAR. (1 Credit)
A guitar performance group designed to explore ensemble rehearsal techniques and repertory.
This course is repeatable for 9 credits.
Recommended: MUP 196 or MUP 296 or MUP 396 or MUP 496

MUS 163. ACCOMPANYING. (1 Credit)
Piano accompanying and chamber music skills, studio experience and weekly performance class.
This course is repeatable for 9 credits.
Recommended: Concurrent enrollment in MUS 190 or MUS 290

MUS 164. CHAMBER ENSEMBLE: STRINGS. (1 Credit)
This course is repeatable for 9 credits.

MUS 165. CHAMBER ENSEMBLE: WOODWINDS. (1 Credit)
This course is repeatable for 9 credits.

MUS 166. CHAMBER ENSEMBLE: BRASS. (1 Credit)
This course is repeatable for 9 credits.

MUS 167. CHAMBER ENSEMBLE: PERCUSSION. (1 Credit)
This course is repeatable for 9 credits.

MUS 168. CHAMBER ENSEMBLE: MISCELLANEOUS. (1 Credit)
This course is repeatable for 9 credits.

MUS 169. OPERA WORKSHOP. (1-2 Credits)
This course is repeatable for 3 credits.

MUS 171. GROUP LESSONS: PIANO I. (1 Credit)
Part 1 of the first-year group piano sequence. Group instruction in piano skills and basic theory.

MUS 172. GROUP PIANO II. (1 Credit)
Part 2 of the first-year group piano sequence. A continuation of MUS 171.
Prerequisites: MUS 171 with C- or better

MUS 173. GROUP PIANO III. (1 Credit)
Part 3 of the first-year group piano sequence. A continuation of MUS 172.
Prerequisites: MUS 172 with C- or better

MUS 177. GROUP LESSONS: PIANO. (1 Credit)
Beginning Piano I, elementary group instruction in piano skills for non-majors.
This course is repeatable for 2 credits.

MUS 178. GROUP LESSONS: PIANO. (1 Credit)
Beginning Piano II: Continuation of MUS 177, piano for non-majors.
This course is repeatable for 2 credits.
MUS 185. VOICE CLASS. (1 Credit)
Students improve and strengthen the voice as a solo instrument.
This course is repeatable for 9 credits.

MUS 186. GROUP GUITAR. (1 Credit)
Teaches fundamentals of the guitar in a small-group setting. Emphasis on practical use of the instrument.
This course is repeatable for 9 credits.

MUS 187. GROUP GUITAR II. (1 Credit)
A continuation of MUS 186, MUS 187 focuses on helping students learn higher functionality in techniques and attain greater ability to perform solo or in ensemble.
Prerequisites: MUS 186 with D- or better
This course is repeatable for 6 credits.

MUS 190. APPLIED MUSICIANSHIP: BEGINNER BEAT MAKING (DAW). (2 Credits)
Teaches the process involved in composing and constructing drum beats for any style of popular music. This course will take you through the basics of understand the roles of each individual drum on a typical drum kit, to programming on an 808 or sequenced style virtual kit. We will also explore putting together your own collection of sounds and building drum and percussion kits for your own creative applications and compositions.
Prerequisites: MUS 111 with C or better
This course is repeatable for 6 credits.

MUS 199. SPECIAL STUDIES. (1-3 Credits)
First-year level.
This course is repeatable for 18 credits.

MUS 201. ENGLISH AND LATIN DICTION FOR SINGERS. (1 Credit)
Presents the principles of lyric diction in English and Latin and provides practice in the skills needed to sing the languages accurately and expressively.

MUS 202. ITALIAN LYRIC DICTION FOR SINGERS. (1 Credit)
Presents the principles of lyric diction in Italian and provides practice in the skills needed to sing the languages accurately and expressively.
Prerequisites: MUS 201 with C or better

MUS 203. GERMAN LYRIC DICTION FOR SINGERS. (1 Credit)
Presents the principles of German lyric diction and provides practice in the skills needed to sing the language accurately and expressively.
Prerequisites: MUS 201 with C or better

MUS 204. FRENCH LYRIC DICTION FOR SINGERS. (1 Credit)
Presents the principles of French lyric diction and provides practice in the skills needed to sing the language accurately and expressively.
Prerequisites: MUS 201 with C or better

MUS 216. THE MUSIC BUSINESS. (3 Credits)
An overview of the many elements that comprise today’s music industry, with an emphasis on the most recent entrepreneurial and creative trends in this multi-billion-dollar business.

MUS 221. LITERATURE AND MATERIALS OF MUSIC. (3 Credits)
Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century.
Recommended: MUS 123

MUS 222. LITERATURE AND MATERIALS OF MUSIC. (3 Credits)
Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century. Three lectures weekly.
Recommended: MUS 221

MUS 223. LITERATURE AND MATERIALS OF MUSIC. (3 Credits)
Advanced harmony, techniques of analysis, musical form, composition. Continued study of the repertory of Western music through the mid-twentieth century. Three lectures weekly.
Recommended: MUS 222

MUS 234. AURAL SKILLS II. (1 Credit)
Sight-singing; melodic and harmonic dictation. To be taken in sequence.
Recommended: MUS 123 and MUS 136

MUS 235. AURAL SKILLS II. (1 Credit)
Sight-singing; melodic and harmonic dictation. To be taken in sequence.
Recommended: MUS 234

MUS 236. AURAL SKILLS II. (1 Credit)
Sight-singing; melodic and harmonic dictation. To be taken in sequence.
Recommended: MUS 235

MUS 251. INTRO TO ARTS ENTREPRENEURSHIP. (3 Credits)
Introduction to Arts Entrepreneurship emphasizes the importance of entrepreneurial thinking in the arts while engaging students with the fundamentals of the arts “business”. The focus of this course is the development of each student’s Digital Portfolio. Each student will explore the arts industry through first-hand experiences with creative problem-solving exercises, discussion questions, collaborative projects, case studies, and hands-on activities. For majors. (FA)
This course is repeatable for 3 credits.

MUS 271. GROUP PIANO IV. (1 Credit)
Part of the second-year group piano sequence. Group instruction in piano skills and basic theory.

MUS 272. GROUP PIANO V. (1 Credit)
Part of the second-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 271 with C- or better

MUS 273. GROUP PIANO VI. (1 Credit)
Part of the second-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 272 with C- or better

MUS 279. INTRODUCTION TO SONGWRITING 1. (3 Credits)
The study of songs and songwriting will be introduced, with special attention paid to the art of lyrics, melody, harmony, and structure to create songs. Songs will be analyzed and composed, and students will listen to popular American songwriting throughout modern history. Students are expected to listen critically and create and collaborate on original song lyrics and music.
This course is repeatable for 6 credits.

MUS 299. SPECIAL STUDIES. (1-3 Credits)
Sophomore level.
This course is repeatable for 18 credits.

MUS 301. SOLO VOCAL REPERTOIRE: ENGLISH. (2 Credits)
Survey of the development of English solo vocal literature from the Renaissance period to the present.
Prerequisites: MUS 123 with C or better

MUS 302. SOLO VOCAL REPERTOIRE: ITALIAN. (2 Credits)
Survey of the development of Italian solo vocal literature from the Renaissance period to the present.
Prerequisites: MUS 123 with C or better

MUS 303. SOLO VOCAL REPERTOIRE: GERMAN. (2 Credits)
Survey of the development of German solo vocal literature from the Renaissance period to the present.
Prerequisites: MUS 123 with C or better
MUS 304. SOLO VOCAL REPERTOIRE: FRENCH. (2 Credits)
Survey of the development of French solo vocal literature from the 19th
century to the present.
Prerequisites: MUS 123 with C or better

MUS 309. *WOMEN IN WESTERN MUSIC. (3 Credits)
Explores the powerful roles women have played in both Western classical
and popular music, from the Medieval Era to the present day. Drawing
on historical, contemporary, and cross-cultural ideas and repertoire, the
course will identify contributions women have made as composers,
performers, patrons, educators, and consumers, and will examine why
women's contributions were ignored in the past. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

MUS 311. MIDI SYSTEMS AND APPLICATIONS. (3 Credits)
Students will develop a thorough understanding of the Musical
Instrument Digital Interface (MIDI) language. Using both hardware and
software environments, they will learn technical and creative approaches
to live and studio MIDI applications expected of the industry professional.
Prerequisites: MUS 112 with C- or better

MUS 313. SOUND SYNTHESIS. (3 Credits)
Examines the various forms of synthesis used in modern electronic
music and audio production. Throughout the course of the term, students
will cultivate listening, programming, and analytical skills through
the study of analog and digital synthesis. Emphasis will be placed on
practical applications of synthesis through original creative projects.
Prerequisites: MUS 213 with C- or better

MUS 315. INTRODUCTION TO CONDUCTING. (2 Credits)
Basic terminology, beat patterns, and baton technique. Introduction
to score preparation. Philosophy and history of conducting are also
addressed.
Recommended: MUS 223 and MUS 236 and piano proficiency exam.

MUS 316. CHORAL CONDUCTING. (2 Credits)
Continuation of MUS 315. Hand gesture technique, score reading, and
score preparation of literature from all major historical periods. Focus
upon principles of developing choral excellence. Includes conducting
practice with a campus ensemble. To be taken in sequence.
Recommended: MUS 315

MUS 317. CHORAL CONDUCTING. (2 Credits)
Continuation of MUS 315. Hand gesture technique, score reading, and
score preparation of literature from all major historical periods. Focus
upon principles of developing choral excellence. To be taken in sequence.
Recommended: MUS 315

MUS 318. INSTRUMENTAL CONDUCTING. (2 Credits)
Continuation of MUS 315, including types of instrumental groups, seating
arrangements, score preparation, and instrumental transposition and
ranges. Advanced baton technique. To be taken in sequence.
Recommended: MUS 315

MUS 319. INSTRUMENTAL CONDUCTING. (2 Credits)
Continuation of MUS 315, including types of instrumental groups, seating
arrangements, score preparation, and instrumental transposition and
ranges. Advanced baton technique. To be taken in sequence.
Recommended: MUS 315

MUS 321. LITERATURE AND MATERIALS OF MUSIC III. (3 Credits)
Twentieth century harmony and counterpoint, including contrapuntal
composition. Continued study and analysis of repertoire into the 21st
century.
Recommended: MUS 223

MUS 324. HISTORY OF WESTERN MUSIC. (3 Credits)
Chronological survey of the Euro-American traditions in music to be taken
in sequence.
Prerequisites: MUS 123 with D- or better
Recommended: MUS 223

MUS 325. HISTORY OF WESTERN MUSIC. (3 Credits)
Traces the development of music history from the early Classic period
through the end of the 19th century. Major trends in orchestral, solo,
chamber and vocal music are explored through lectures, readings,
research, discussion, score studies, and intensive writing assignments.
( Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MUS 123 with D- or better
Recommended: MUS 223

MUS 326. HISTORY OF WESTERN MUSIC. (3 Credits)
Chronological survey of the Euro-American traditions in music to be taken
in sequence.
Prerequisites: MUS 123 with D- or better
Recommended: MUS 223

MUS 330. ALEXANDER TECHNIQUE FOR MUSICIANS. (1 Credit)
A theoretical and practical introduction to the Alexander Technique, a
psychophysical reeducation process developed by F.M. Alexander. The
course will provide the opportunity for instrumentalists and singers to
integrate the Alexander Technique into their practice and performance,

Prerequisites: MUS 123 with D- or better
This course is repeatable for 6 credits.

MUS 337. JAZZ IMPROVISATION. (1-3 Credits)
Instrumental and vocal improvisation including composition and
arranging techniques.
This course is repeatable for 9 credits.

MUS 340. OSU CHAMBER CHOIR. (1-2 Credits)
A select ensemble of approximately 40 mixed voices. Performance each
term. Annual tours. Students must have two years college-level vocal
experience or equivalent. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 341. VOCAL PEDAGOGY I. (2 Credits)
Provides an understanding of the singing voice and establishes
guidelines for teaching vocal techniques. Explores the anatomical,
physiological and acoustic elements of singing, providing students with a
working knowledge of the vocal mechanism.
Prerequisites: MUP 291 with C or better

MUS 344. INSTRUMENTAL PEDAGOGY AND REPERTOIRE. (3 Credits)
This course is directed towards the student who anticipates a career
as a professional musician in a performance group, soloist, or as an
instrumental studio instructor.
Recommended: Music lessons MUP 300 or higher

MUS 346. WOMEN'S CHOIR. (1-2 Credits)
A women's ensemble designed for vocal development and exploration of
treble choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.
MUS 347. MEN’S CHOIR. (1-2 Credits)
A men’s ensemble designed for vocal development and exploration of TTBB choral literature. Performances each term.
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 350. SYMPHONIC BAND. (1 Credit)
A select ensemble of approximately 80 wind and percussion players. Performance winter and spring terms. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 351. CAMPUS BAND. (1 Credit)
Wind and percussion ensemble of approximately 70 players. Performance each term. Open to all students.
This course is repeatable for 9 credits.

MUS 352. RHYTHM AND BEAVS PEP BAND. (1 Credit)
An auditioned group of 12 musicians who perform at university, community, and athletic events throughout the year.
This course is repeatable for 9 credits.

MUS 353. MARCHING BAND. (1-2 Credits)
A marching and playing unit of more than 160 musicians. Performs for home football games; one trip each year to an off-campus game.
This course is repeatable for 6 credits.

MUS 354. BASKETBALL BAND. (1 Credit)
An ensemble of approximately 50 players. Performs for home games. Students must have two years college-level experience.
This course is repeatable for 3 credits.

MUS 355. COLOR GUARD. (1 Credit)
A derivative of the Marching Band Color Guard, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 3 credits.

MUS 356. INDOOR DRUM LINE. (1-2 Credits)
A derivative of the Marching Band Drum Line, this ensemble performs and competes around the Pacific Northwest during winter term. Audition required.
This course is repeatable for 3 credits.

MUS 357. SMALL JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 358. LARGE JAZZ ENSEMBLE. (1 Credit)
Concentration on current jazz styles. Performance each term.
This course is repeatable for 9 credits.

MUS 360. UNIVERSITY SYMPHONY ORCHESTRA. (1 Credit)
An ensemble of 65-80 players. Performance of orchestral repertoire from the 18th, 19th, and 20th centuries. Performance each term. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
This course is repeatable for 9 credits.

MUS 362. CHAMBER ENSEMBLE: GUITAR. (1 Credit)
A guitar performance group designed to explore ensemble rehearsal techniques and repertoire.
This course is repeatable for 9 credits.
Recommended: MUP 196 or MUP 296 or MUP 396 or MUP 496

MUS 363. ACCOMPANYING. (1 Credit)
Piano accompanying and chamber music skills, studio experience, and weekly performance class.
This course is repeatable for 9 credits.
Recommended: Concurrent enrollment in MUS 390 or MUS 490. Two years college-level ensemble.

MUS 364. CHAMBER ENSEMBLE: STRINGS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 365. CHAMBER ENSEMBLE: WOODWINDS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 366. CHAMBER ENSEMBLE: BRASS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 367. CHAMBER ENSEMBLE: PERCUSSION. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 368. CHAMBER ENSEMBLE: MISCELLANEOUS. (1 Credit)
May be repeated for a maximum of 9 credits.
This course is repeatable for 9 credits.

MUS 369. OPERA WORKSHOP. (1-2 Credits)
This course is repeatable for 3 credits.

MUS 371. GROUP PIANO VII. (1 Credit)
Part of the third-year group piano sequence. Group instruction in piano skills and basic theory.

MUS 372. GROUP PIANO VIII. (1 Credit)
Part of the third-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 371 with C- or better

MUS 373. GROUP PIANO IX. (1 Credit)
Part of the third-year group piano sequence. Group instruction in piano skills and basic theory.
Prerequisites: MUS 372 with C- or better

MUS 375. INTRODUCTION TO PIANO TUNING. (3 Credits)
Provides an introduction to the science of piano tuning and general piano maintenance. Students will acquire knowledge of the construction of the modern piano and its predecessors. They will learn about the temperaments and the science of tuning. Finally, through supervised instruction and practice, students will learn the skill of how to tune a modern piano.
This course is repeatable for 6 credits.

MUS 378. MUSICAL WELLNESS FOR PIANISTS. (3 Credits)
Pianists are offered a body of knowledge that enables them to cultivate mindful, healthful learning and performance processes for themselves and their students. Special focus is given to dealing with fatigue, physical limitations, and injuries.
This course is repeatable for 6 credits.

MUS 399. SPECIAL STUDIES. (1-3 Credits)
Junior level.
This course is repeatable for 18 credits.
MUS 400. *STUDIES IN WRITING ABOUT MUSIC. (3 Credits)
Students will read relevant literature pertaining to a selected topic. These readings will be discussed during the class period, serve as a basis of knowledge for the writing assignments throughout the quarter, and promote critical thinking about the topic. As a Writing Intensive Course (WIC), a large portion of the term will be devoted to learning various genres of writing about music, including formal writing and informal, low-stakes writing. Students will be introduced to a variety of ways of writing about music through the course readings and will learn how to tailor one's writing style towards a genre's particular audience. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: MUS 325 with C or better
Recommended: Completion of a WR II course
MUS 401. RESEARCH AND SCHOLARSHIP. (1-6 Credits)
This course is repeatable for 18 credits.
MUS 402. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 18 credits.
MUS 403. THESIS. (1-6 Credits)
This course is repeatable for 18 credits.
MUS 405. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 18 credits.
MUS 406. PROJECTS. (1-6 Credits)
This course is repeatable for 18 credits.
MUS 407. SEMINAR. (1-6 Credits)
Equivalent to: MUS 407H
This course is repeatable for 18 credits.
MUS 408. WORKSHOP. (1-6 Credits)
This course is repeatable for 18 credits.
MUS 409. PIANO PEDAGOGY PRACTICUM. (2 Credits)
A practical application course offering experiential learning and supervised teaching experiences to piano pedagogy students. Serves as a practicum co-requisite for the final two terms of Piano Pedagogy (MUS 446 and MUS 447).
Corequisites: MUS 446, MUS 447
This course is repeatable for 8 credits.
MUS 410. INTERNSHIP. (3 Credits)
Provides experience in field settings, opportunity to develop personal and professional skills. See school for details.
This course is repeatable for 12 credits.
MUS 442. GENRE STUDIES. (3 Credits)
Intensive study of selected genres, such as orchestra, chamber music, keyboard literature, vocal literature, music theatre and opera.
Equivalent to: MUS 442H
This course is repeatable for 18 credits.
MUS 443. THEORY AND COMPOSITION STUDIES. (3 Credits)
Intensive study of selected subjects, such as analysis, composition, choral arranging, band arranging, and orchestration.
This course is repeatable for 18 credits.
Recommended: MUS 223
MUS 444. FOUNDATIONS OF PIANO PEDAGOGY. (3 Credits)
Introduction to foundational principles of piano instruction and addresses topics surrounding methodology, materials, and the techniques of teaching piano.
This course is repeatable for 6 credits.
MUS 445. PIANO PEDAGOGY I: BEGINNING AND ELEMENTARY STUDENTS. (3 Credits)
Introduces basic foundational ideas of piano instruction at the beginning and elementary levels. Students will engage with topics surrounding methodology, materials, and the techniques of teaching piano to the beginning and elementary student.
MUS 446. PIANO PEDAGOGY II. (3 Credits)
The second in a three-term sequence. The course reinforces foundational ideas and skills learned in Pedagogy I, and continues on to address methodology, materials, and techniques surrounding group piano teaching, teaching preschoolers, and teaching adults. Students will engage in supervised teaching experiences in class as well as in a corresponding lab practicum course which should be taken in conjunction with Pedagogy II. Students must also register for MUS 409.
Prerequisites: MUS 445 with D- or better
Corequisites: MUS 409
MUS 447. PIANO PEDAGOGY III. (3 Credits)
The third in a three-term sequence. The course reinforces foundational ideas learned in Pedagogy I and Pedagogy II, and continues with emphasis on special topics and projects preparing students for a professional career as independent piano teachers. Students must also register for MUS 409.
Prerequisites: MUS 446 with D- or better
Corequisites: MUS 409
MUS 451. INTRODUCTION TO ARTS ENTREPRENEURSHIP. (3 Credits)
Survey of the business strategies behind a successful career in the arts. Emphasizes the importance of entrepreneurial thinking, engages students with the fundamentals of the arts 'business', and explores ways to influence and shape the industry's future. CROSSLISTED as ART 451/MUS 451/TA 451. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Equivalent to: ART 451, TA 451
MUS 472. ITALIAN AND LATIN DICTION FOR SINGERS. (2 Credits)
Presents the principles of lyric diction in Italian and liturgical Latin and provides practice in the skills needed to sing the languages accurately and expressively.
MUS 481. PIANO LITERATURE I: 18TH THROUGH EARLY 19TH CENTURIES. (3 Credits)
Examines the evolution of piano literature from the Baroque period through the early 19th Century. Examines individual styles and composers' works in the context of the surrounding cultural and social history, beginning with the birth of the piano and continuing with the piano's growing popularity in Western European society. An emphasis will be placed on listening experience and the aural identification of landmark piano works. Students to gain familiarity with a rich body of piano repertoire in the historical and social context in which it was composed.
MUS 482. PIANO LITERATURE II: 19TH AND 20TH CENTURIES. (3 Credits)
Examines the evolution of piano literature in the 19th and 20th centuries. Students will learn about individual styles and composers' works in the context of the surrounding cultural and social history of the piano. An emphasis will be placed on listening experience and the aural identification of landmark piano works. The overall objective of the course is for students to gain familiarity with a rich body of piano repertoire in the historical and social context in which it was composed.
MUS 485. PIANO LITERATURE III: REPERTOIRE FOR TEACHING THE PIANO. (3 Credits)
This specialized area of Piano Pedagogy includes repertoire for piano students of varying levels, analytical skills for evaluating repertoire for students, and repertoire requirements for national and international piano teaching organizations.

MUS 493. BASIC RECORDING TECHNIQUES. (3 Credits)
The first of a three-term sequence on analog and digital recording and editing techniques. The first term deals with issues such as signal processing, microphone design and placement, and an introduction to Digidesign Pro-Tools.
This course is repeatable for 9 credits.
Recommended: MUS 123

MUS 494. INTERMEDIATE RECORDING TECHNIQUES. (3 Credits)
The second of a three-term sequence on analog and digital recording and editing techniques. The second term deals with multi-track recording, MIDI interfacing and recording, advanced microphone placement, intermediate Pro-tools, and an introduction to E-magic Logic.
Recommended: MUS 493

MUS 495. ADVANCED RECORDING TECHNIQUES. (3 Credits)
The third of a three-part sequence on analog and digital recording and editing techniques. The third term deals with advanced multi-track recording, sampling, MIDI interfacing and recording, mixing and mastering using Waveburner, advanced Pro-Tools, advanced use of E-magic Logic recording and editing and portable ADAT recording and editing.
Recommended: MUS 494

MUS 496. SURROUND SOUND RECORDING AND MASTERING. (2 Credits)
Survey of the concepts, equipment, and standard procedures used in surround sound audio and audio-for-video, including basic equipment and software configuration, surround recording and editing techniques, advanced automation using Pro Tools, and layback/sync to video.
Prerequisites: MUS 495 with D- or better

MUS 499. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 18 credits.

MUS 501. RESEARCH AND SCHOLARSHIP. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 503. THESIS. (1-6 Credits)
This course is repeatable for 999 credits.

MUS 505. READING AND CONFERENCE. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 506. PROJECTS. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 507. SEMINAR. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 508. WORKSHOP. (1-6 Credits)
This course is repeatable for 18 credits.

MUS 510. INTERNSHIP. (3 Credits)
Provides experience in field settings, opportunity to develop personal and professional skills. See school for details.
This course is repeatable for 12 credits.

MUS 516. ADVANCED CONDUCTING: CHORAL. (3 Credits)
Baton technique, interpretation and the study of major choral scores.
Recommended: MUS 317

MUS 517. ADVANCED CONDUCTING: CHORAL. (3 Credits)
Baton technique, interpretation and the study of major choral scores.
Recommended: MUS 317

MUS 518. ADVANCED CONDUCTING: INSTRUMENTAL. (3 Credits)
Baton technique, interpretation and the study of major instrumental scores.
Recommended: MUS 319

MUS 519. ADVANCED CONDUCTING: INSTRUMENTAL. (3 Credits)
Baton technique, interpretation and the study of major instrumental scores.
Recommended: MUS 319

MUS 540. OSU CHAMBER CHOIR. (1-2 Credits)
A select ensemble of approximately 40 mixed voices. Performance each term. Annual tours. 500-level credit available only to students who can demonstrate proficiency and experience to perform at the graduate level. This will be evaluated by the instructor through audition.
This course is repeatable for 6 credits.

MUS 543. THEORY AND COMPOSITION STUDIES. (3 Credits)
Intensive study of selected subjects, such as analysis, composition, choral arranging, band arranging, and orchestration.
This course is repeatable for 18 credits.
Recommended: MUS 223

MUS 546. WOMEN'S CHOIR. (1-2 Credits)
A women's ensemble designed for vocal development and exploration of treble choral literature. Performances each term.
This course is repeatable for 9 credits.

MUS 547. MEN'S CHOIR. (1-2 Credits)
A men's ensemble designed for vocal development and exploration of TTBB choral literature. Performances each term.
This course is repeatable for 9 credits.

MUS 550. SYMPHONIC BAND. (1 Credit)
A select ensemble of approximately 80 wind and percussion players. Performance winter and spring terms. 500-level credit available only to students who can demonstrate proficiency and experience sufficient to perform at the graduate level. This will be evaluated by the instructor by audition.
This course is repeatable for 6 credits.

MUS 560. UNIVERSITY SYMPHONY ORCHESTRA. (1 Credit)
An ensemble of 65-80 players. Performance of orchestral repertoire from the 18th, 19th, and 20th centuries. Performance each term. 500-level credit available only to students who can demonstrate proficiency and experience to perform at the graduate level. This will be evaluated by the instructor through audition.
This course is repeatable for 6 credits.

MUS 563. ACCOMPANYING. (1 Credit)
Piano accompanying and chamber music skills, studio experience and weekly performance class. 500-level credit available only to students who can demonstrate proficiency and experience sufficient to perform at the graduate level. This will be evaluated by the instructor by audition.
This course is repeatable for 6 credits.
Recommended: Concurrent enrollment in MUP 590

MUS 572. ITALIAN AND LATIN DICTION FOR SINGERS. (2 Credits)
Presents the principles of lyric diction in Italian and liturgical Latin and provides practice in the skills needed to sing the languages accurately and expressively.
MUS 573. GERMAN DICTION FOR SINGERS. (2 Credits)
 Presents the principles of German lyric diction and provides practice in the skills needed to sing the language accurately and expressively.

MUS 599. SPECIAL STUDIES. (1-16 Credits)
 This course is repeatable for 6 credits.

Music (Studio) (MUP)

MUP 161. INDIVIDUAL LESSONS: BEGINNING STRINGS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 162. INDIVIDUAL LESSONS: BEGINNING BRASS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 163. INDIVIDUAL LESSONS: BEGINNING WOODWINDS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 164. INDIVIDUAL LESSONS: BEGINNING VOICE. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 165. INDIVIDUAL LESSONS: BEGINNING PERCUSSION. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 170. INDIVIDUAL LESSONS: INTERMEDIATE PIANO. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 171. INDIVIDUAL LESSONS: INTERMEDIATE STRINGS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 172. INDIVIDUAL LESSONS: INTERMEDIATE BRASS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 173. INDIVIDUAL LESSONS: INTERMEDIATE WOODWINDS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 174. INDIVIDUAL LESSONS: INTERMEDIATE VOICE. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 175. INDIVIDUAL LESSONS: INTERMEDIATE PERCUSSION. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 190. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 191. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 192. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 193. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 194. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 195. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 196. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
 Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
 This course is repeatable for 12 credits.
 Recommended: MUS 162 or MUS 362

MUP 290. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 291. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 292. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 293. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 294. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 295. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 296. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
 Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
 This course is repeatable for 12 credits.
 Recommended: MUS 164

MUP 390. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 391. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 392. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 393. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 394. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 395. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 396. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
 Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
 This course is repeatable for 12 credits.
 Recommended: MUS 162 or MUS 362

MUP 398. JUNIOR RECITAL. (1 Credit)
 Time is dedicated towards the applied music project for junior music performance majors. A public recital will be given during junior-level applied study with the approval of the applied teacher. Graded P/N.

MUP 490. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 491. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 492. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 493. INDIVIDUAL LESSONS: WOODWINDS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 494. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 495. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
 This course is repeatable for 12 credits.

MUP 496. INDIVIDUAL LESSONS: GUITAR. (1-2 Credits)
 Private studio guitar lessons designed to explore effective practice strategies, technique, and repertoire.
 This course is repeatable for 12 credits.
 Recommended: MUS 162 or MUS 362
MUP 498. SENIOR RECITAL. (1 Credit)
Time is dedicated towards the final applied music project for instrumental and voice music majors. A public recital will be given after the completion of junior-level applied study with the approval of the applied teacher. Graded P/N.

MUP 590. INDIVIDUAL LESSONS: KEYBOARD. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 591. INDIVIDUAL LESSONS: VOICE. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 592. INDIVIDUAL LESSONS: STRINGS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 594. INDIVIDUAL LESSONS: BRASS. (1-2 Credits)
This course is repeatable for 12 credits.

MUP 595. INDIVIDUAL LESSONS: PERCUSSION. (1-2 Credits)
This course is repeatable for 12 credits.

Music Education (MUED)

MUED 100. MUSIC EDUCATION IN PUBLIC SCHOOLS. (3 Credits)
An introduction to the practice of teaching music in public schools in the United States. Participants will learn about teaching and learning music through reading, discussion, creative projects, field observations, and peer teaching experiences. Provides a breadth of experiences so prospective teachers can make informed decisions regarding their career path. While completion of this course does not guarantee admittance to the Music Education Program at OSU, it will prepare candidates for the admission process.

Prerequisites: MUS 121 with C or better

MUED 201. VOCAL DICTION SEMINAR I: LATIN AND GERMAN. (1 Credit)
A laboratory course in Latin and German vocal diction for choral music education majors. Emphasis on the pronunciation of sung texts and the International Phonetic Alphabet.

Prerequisites: MUED 100 with B- or better

MUED 202. VOCAL DICTION SEMINAR II: ITALIAN AND FRENCH. (1 Credit)
A laboratory course in Italian and French vocal diction for choral music education majors. Emphasis on the pronunciation of sung texts and the International Phonetic Alphabet.

Prerequisites: MUED 100 with B- or better

MUED 275. PROFESSIONAL SEMINAR IN MUSIC EDUCATION I. (1 Credit)
Provides a professional community for emerging music educators. Students will complete field-work, interact with field specialists and practitioners, and study emerging topics and contemporary practices in music education. Students will begin to develop their professional portfolios. This course begins a series of seminars, which will be dedicated to professional development the exploration of trends in music education.

Prerequisites: MUED 100 with B- or better

MUED 276. PROFESSIONAL SEMINAR IN MUSIC EDUCATION II. (1 Credit)
Continued engagement in field-work, interaction with field specialists and practitioners, and a study of emerging topics and contemporary practices in music education.

Prerequisites: MUED 100 with B- or better

MUED 277. PEDAGOGIC TECHNIQUES FOR THE MUSIC EDUCATOR. (1 Credit)
MUED 277: Brass; MUED 277: Woodwinds; MUED 277: Strings; MUED 277: Voice (Instrumentalists); MUED 277: Vocal Pedagogy (Singers); MUED 277: Percussion; MUED 277: Guitar. Topics: performance using proper beginning technique for each instrument, and description/assessment of proper technique for each instrument at the intermediate and advanced level. Emphasis is on techniques for teaching in classroom settings.

This course is repeatable for 7 credits.

MUED 350. JAZZ PEDAGOGY. (1 Credit)
Explores basic concepts and pedagogies of jazz music as applicable to the school jazz ensemble. Establishes a basic foundation of jazz knowledge and pedagogy that can be built upon in future independent learning endeavors.

Prerequisites: MUED 100 with B- or better

MUED 353. MUSIC EDUCATION IN PUBLIC SCHOOLS. (3 Credits)
Examines historical practices, philosophical differences and pedagogical approaches that influence public school music programs. Field experiences provide contextual models with genuine teaching opportunities each week.

Prerequisites: MUS 121 with D- or better

MUED 375. PROFESSIONAL SEMINAR IN MUSIC EDUCATION III. (1 Credit)
Continued interaction with field specialists and practitioners, and study of emerging topics and contemporary practices in music education. Fieldwork focuses on instructional strategies for guiding critical thinking and creative music listening.

Prerequisites: MUED 100 with B- or better

MUED 376. PROFESSIONAL SEMINAR IN MUSIC EDUCATION IV. (1 Credit)
Continued interaction with field specialists and practitioners, and study of emerging topics and contemporary practices in music education. Fieldwork focuses on observation, leadership of composition, and improvisation activities.

Prerequisites: MUED 100 with B- or better

MUED 391. SECONDARY GENERAL MUSIC FOUNDATIONS. (3 Credits)
Prepares the teacher candidate to design and facilitate experiences in music learning appropriate for secondary students (grades 6 to 12).

Prerequisites: MUED 100 with B- or better

MUED 392. SEMINAR IN SECONDARY GENERAL MUSIC. (1 Credit)
Focuses on special topics (drumming) that follow evolving trends in secondary general music education.

Prerequisites: MUED 100 with D- or better

MUED 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 18 credits.

MUED 406. PROJECT. (1 Credit)
Editing and refining of portfolio materials representing professional growth in teaching throughout the Professional Teacher and Counselor Education Program. Includes work samples, assessments, reflections, and videotapes.

This course is repeatable for 18 credits.
MUED 408. WORKSHOP. (1-16 Credits)  
May be repeated for a maximum of 18 credits.  
This course is repeatable for 18 credits.

MUED 410. INTERNSHIP/STUDENT TEACHING. (1-10 Credits)  
An immersive 60-day experience. Daily experience with communicating content, planning, assessment, and classroom management in a guided field setting. Student teaching is a requirement for Oregon licensure.  
This course is repeatable for 99 credits.

MUED 413. THEORY AND PRACTICUM: FIELD. (1-4 Credits)  
Field experience in music classroom. For pre-MAT students taking 4 credits, the experience is approximately 10 hours per week in elementary-level classroom.

MUED 450. SURVEY OF WIND LITERATURE. (1 Credit)  
Examines different time periods of wind band literature from the Renaissance through current repertoire. Explores wind band literature through study of the music and historical practices.  
Prerequisites: MUED 326 with B- or better

MUED 460. PSYCHOLOGY OF MUSIC. (3 Credits)  
The study and evaluation of psychological, physiological, and neurological aspects of musical behavior and experience; including but not limited to acoustics, human hearing, perception and cognition, development and expertise, affective response and preference, unusual abilities, and selected special topics.

MUED 469. MARCHING BAND TECHNIQUES LABORATORY. (1 Credit)  
Provides an in-depth study of the unique techniques and demands of running a marching band.  
Prerequisites: MUS 121 with C or better

MUED 470. METHODS AND MATERIALS FOR THE PUBLIC SCHOOL WIND BAND. (3 Credits)  
Includes examination of method books, instructional materials, and music for middle school and high school band. Class format is lecture, discussions, and microteaching demonstrations. Includes study of past and current methods of improving student musical understanding and performance through band literature and rehearsal techniques.  
Recommended: MUS 318 and MUS 319

MUED 471. INVESTIGATING MUSICAL CULTURES. (3 Credits)  
Immerse yourself in an unfamiliar musical culture and learn how to teach students about it. Become better prepared to work effectively with multicultural materials, and to use culturally appropriate pedagogical approaches. Music will be emphasized as a gateway to cultural understanding, but previous musical experience is not required.

MUED 473. METHODS FOR TEACHING ELEMENTARY MUSIC. (3 Credits)  
Focuses on pedagogical content knowledge in music for specialists preparing to teach Kindergarten through grade five. Students will focus on the developmental characteristics of learners, repertoire and instructional techniques appropriate for the elementary music classroom, and lesson planning incorporating state and national standards. Issues related to diverse and special needs populations will be interwoven throughout each segment of the course.  
Prerequisites: MUED 353 with D- or better

MUED 474. ELEMENTARY APPROACHES SEMINAR I. (1 Credit)  
Topics include practical applications of varied teaching methods, lesson planning, curricular design, repertoire, and resources for the general music classroom at the elementary level.  
Prerequisites: MUED 473 with B- or better

MUED 475. ELEMENTARY APPROACHES SEMINAR II. (1 Credit)  
Provides the foundation for teacher candidates to develop a critical disposition regarding contemporary issues in the general music classroom.  
Prerequisites: MUED 473 with B- or better

MUED 477. CLASSROOM INSTRUMENTAL TECHNIQUES. (2 Credits)  
A brief overview of fundamental principles and playing techniques of brass, percussion, string, and woodwind instruments designed for the choral music educator who uses instrumental accompaniment or conducts an instrumental ensemble.  
Recommended: MUS 222 and MUS 234 and MUS 319

MUED 480. CLASSROOM CHORAL METHODS. (3 Credits)  
Examines research, theory, and pedagogical methods of choral classrooms. Primary topics: the role of choral music in various school settings and the responsibilities of the music teacher in developing/implementing goals and objectives for a choral music education curriculum.  
Prerequisites: MUED 100 with B- or better

MUED 499. SPECIAL STUDIES. (1-16 Credits)  
May be repeated for a maximum of 18 credits.  
This course is repeatable for 18 credits.

MUED 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)  
This course is repeatable for 18 credits.

MUED 502. INDEPENDENT STUDY. (1-16 Credits)  
This course is repeatable for 18 credits.

MUED 503. THESIS. (1-16 Credits)  
This course is repeatable for 99 credits.

MUED 505. READING AND CONFERENCE. (1-16 Credits)  
This course is repeatable for 18 credits.

MUED 506. PROJECTS. (1-16 Credits)  
This course is repeatable for 18 credits.

MUED 507. THEORY AND PRACTICUM SEMINAR. (1-4 Credits)  
Field experience in music classroom.  
This course is repeatable for 10 credits.

MUED 508. WORKSHOP. (1-16 Credits)  
This course is repeatable for 18 credits.

MUED 510. PROFESSIONAL INTERNSHIP. (3-15 Credits)  
A supervised teaching experience at a variety of public school levels. The student works with an experienced mentor teacher, accepting the professional responsibilities of teaching.  
This course is repeatable for 15 credits.

MUED 521. SPECIAL TOPICS IN MUSIC ED. (3 Credits)  
Advanced pedagogy in one particular area within music education, such as jazz band techniques, computer design of marching band drills, advanced technology in music education. Topics will vary.

MUED 560. PSYCHOLOGY OF MUSIC. (3 Credits)  
The study and evaluation of psychological, physiological, and neurological aspects of musical behavior and experience; including but not limited to acoustics, human hearing, perception and cognition, development and expertise, affective response and preference, unusual abilities, and selected special topics.

MUED 562. RESEARCH IN MUSIC EDUCATION. (3 Credits)  
Introduction to the historical, philosophical, quantitative and qualitative research methodologies in music education. Includes interpretation and application of findings published in major research journals.
MUED 570. METHODS AND MATERIALS FOR THE PUBLIC SCHOOL WIND BAND. (3 Credits)
Includes examination of method books, instructional materials, and music for middle school and high school band. Class format is lecture, discussions, and microteaching demonstrations. Includes study of past and current methods of improving student musical understanding and performance through band literature and rehearsal techniques.

MUED 571. INVESTIGATING MUSICAL CULTURES. (3 Credits)
Immerse yourself in an unfamiliar musical culture and learn how to teach students about it. Become better prepared to work effectively with multicultural materials, and to use culturally appropriate pedagogical approaches. Music will be emphasized as a gateway to cultural understanding, but previous musical experience is not required.

MUED 573. METHODS FOR TEACHING ELEMENTARY MUSIC. (3 Credits)
Focuses on pedagogical content knowledge in music for specialists preparing to teach Kindergarten through grade five. Students will focus on the developmental characteristics of learners, multiple representations of the subject matter, and lesson planning incorporating state and national standards. Issues related to diverse and special needs populations will be interwoven throughout each segment of the course.
Recommended: MUED 353

MUED 574. MIDDLE LEVEL MUSIC EDUCATION. (3 Credits)
This methods course focuses on general music education, grades four through eight. Students explore relationships between teaching and learning in order to effectively plan for instruction.

MUED 580. SECONDARY VOCAL MUSIC EDUCATION. (3 Credits)
This methods course focuses on vocal music education, grades nine through twelve. Students explore relationships between teaching and learning in order to effectively plan for instruction.

MUED 581. SECONDARY INSTRUMENTAL MUSIC EDUCATION. (3 Credits)
This methods course focuses on instrumental music education, grades nine through twelve. Students explore relationships between teaching and learning in order to effectively plan for instruction.

MUED 591. CURRICULUM FOUNDATIONS IN MUSIC EDUCATION. (3 Credits)
Examination of historical, philosophical, and social influences on contemporary music education emphasizing 1950 through the present, culminating in the National Standards for Arts Education.

MUED 592. FOUNDATIONS OF MUSIC EDUCATION II:. (3 Credits)
CURRICULUM IMPLEMENTATION AND EVALUATION Students design and construct a comprehensive music education curriculum grounded in current research, the National Standards for Arts Education and Oregon's Common Curriculum Goals.

MUED 593. MUSIC TECHNOLOGY. (3 Credits)
Specific applications for teaching music incorporating appropriate software and hardware for curricular integration and curricular evolution.

MUED 599. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 18 credits.

Natural Resources (NR)

NR 201. MANAGING NATURAL RESOURCES FOR THE FUTURE. (3 Credits)
Overview of the complexities involved in managing natural resources of the Pacific Northwest. Exposure to major natural resource issues of the region. Development of critical thinking skills useful in seeking solutions.

NR 202. NATURAL RESOURCE PROBLEMS AND SOLUTIONS. (3 Credits)
Exploration of the multiple components (ecological, social, political, ethical) of selected natural resource problems. Uses case studies to illustrate how social and biophysical characteristics of environmental problems influence the methods used to try to solve these problems and their potential for success.
Recommended: NR 201

NR 312. CRITICAL THINKING FOR NATURAL RESOURCE CHALLENGES. (3 Credits)
Provides an introduction to critical thinking as it applies to issues and problems in natural resources. Attention is given to formal argument analysis, fallacies of argumentation, and critical scientific and philosophical concepts.
Recommended: Sophomore standing

NR 325. SCIENTIFIC METHODS FOR ANALYZING NATURAL RESOURCE PROBLEMS. (3 Credits)
Approaches to disciplinary and interdisciplinary problem analysis in natural resources. Introduces systems thinking and the benefits and limitations of different tools used to integrate information from multiple disciplines and stakeholders. Applications of alternative analysis tools are illustrated through selected forest-related case studies. Lec/lab.
Prerequisites: MTH 111 with C- or better or Math Placement - ALEKS with a score of 060
Recommended: NR 201 and (ST 201 or ST 351)

NR 351. WHEN SCIENCE ESCAPES THE LAB: SCIENCE AND RESOURCE MANAGEMENT. (3 Credits)
Role of science in solving natural resource problems. Selecting the 'best available science.' How science is portrayed, filtered, and used by the media and interests groups to affect policy and management. Analysis of case studies on use of science in natural resource decision making.
Recommended: Sophomore standing and NR 312

NR 380. NATURE IN STORYTELLING OVER THE CENTURIES. (3 Credits)
Examines the historic trend across cultures to mythologize elements of the natural world, resulting in celebrated myths, fables, and stories. The course examines nature-based folklore from past centuries, uncovering early perceptions of landscapes, creatures, and plants held by societies and cultures. Focus then shifts to exploration of how elements of the natural world have been portrayed in contemporary film, television, and advertising, revealing how perceptions of nature have evolved over the past century. Connections between contemporary popular culture and old-world myths, fables, and stories will thus be revealed.

NR 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

NR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

NR 405. READING AND CONFERENCE. (1-9 Credits)
This course is repeatable for 18 credits.

NR 406. PROJECTS. (1-9 Credits)
This course is repeatable for 16 credits.

NR 407. SEMINAR. (1-9 Credits)
This course is repeatable for 18 credits.

NR 410. INTERNSHIP. (1-6 Credits)
This course is repeatable for 12 credits.
NR 455. NATURAL RESOURCE DECISION MAKING. (4 Credits)
Students will participate on collaborative planning teams that effectively engage stakeholders in the decision making process, and offer sound natural resource decisions that are supported by multiple interests.
Prerequisites: FES 485 with D- or better and [BI 371 [D-] or BI 373 [D-] or ENSC 479 [D-] or FE 460 [D-] or FES 486 [D-] or FOR 460 [D-] or FW 435 [D-] or FW 439 [D-] or FW 454 [D-] or FW 497 [D-] or GEOG 323 [D-] or HORT 318 [D-] or SOIL 395 [D-] or WR 462 [D-])

NR 477. *AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/ NR 477 and FES 577/RNG 577. (Bacc Core Course)
Attributes: CGSI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FES 477, FS 477, RNG 577
Recommended: Introductory course in biology.

NR 499. SPECIAL TOPICS. (1-16 Credits)
This is a hybrid course when offered by Ecampus.
Equivalent to: NR 499H
This course is repeatable for 16 credits.

NR 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: NR 499
This course is repeatable for 16 credits.

Naval Science (NS)

NS 002. LEADERSHIP. (0 Credits)
Provides students with basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience help students explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

NS 111. INTRO TO NAVAL SCIENCE. (3 Credits)
Naval organization and administration; organization of the Navy or Marine Corps, the Navy and Marine Corps as a career, responsibilities and commitments as an officer in the Navy or Marine Corps.

NS 112. U.S. NAVAL HISTORY I. (3 Credits)
A study of U.S. seapower and maritime affairs from the American Revolution through 1900. Lec/lab.

NS 113. U.S. NAVAL HISTORY II. (3 Credits)
A study of U.S. seapower and maritime affairs from 1900 through present day. Lec/lab.
Prerequisites: NS 112 with D- or better

NS 211. LEADERSHIP AND MANAGEMENT. (5 Credits)
Overview of the principles, philosophies, and methodologies of effective Naval leadership with emphasis on moral, ethical actions with respect to the principles of authority, responsibility, and accountability as they apply to military organizations.

NS 212. NAVAL ENGINEERING. (5 Credits)
Propulsion, basic engineering systems theory, and concepts application in modern ship and jet propulsion. Course will include auxiliary systems, theory and design of shipboard auxiliaries, ship design, and damage control/safety procedures. Offered every other winter term.
Prerequisites: NS 111 with D- or better

NS 311. NAVIGATION. (5 Credits)
Introduction to navigation including piloting, dead reckoning, and voyage planning. Course includes nautical rules of the road, maneuvering board, relative motion, and shipboard external communications.

NS 313. NAVAL OPERATIONS AND SEAMANSHIP. (3 Credits)
Theory of shiphandling, communications, shipboard evolutions, heavy weather, case study discussions.
Prerequisites: NS 311 with D- or better

NS 321. EVOLUTION OF WARFARE. (5 Credits)
Provides a basic understanding of the art and practice of warfare from the beginning of recorded history to present day. Utilizes Marine Corps Doctrinal Publications as base documents to evaluate warfare technology, tactics, and strategic thought. Special emphasis is placed on the evolution of warfare, and decision-making at all levels of war. Historical case studies recognize and reinforce patterns, enduring themes, and principles of warfighting. Historical study is not simply to ascertain what happened, but to use historical lessons learned as a basis for making practical judgments about the present and future.

NS 323. NAVAL SCIENCE III: MARINE CORPS OPTION. (3 Credits)
Preparation for officer candidates’ school and practical field exercises. For U.S. Marine Corps candidates option.
Prerequisites: NS 322 with D- or better

NS 405. READING AND CONFERENCE. (1-16 Credits)
To prepare midshipmen returning from a leave of absence from the Naval ROTC program for commissioning and entrance into the fleet.
This course is repeatable for 16 credits.

NS 411. NAVAL WEAPONS SYSTEMS. (5 Credits)
Introduction to the theory and development of U.S. Naval weapons systems, current weapons systems types, platforms, and employment. Course will include naval weapons systems types, launch platforms, characteristics and employment.
Prerequisites: NS 111 with D- or better

NS 413. LEADERSHIP AND ETHICS. (4 Credits)
The second of two core leadership courses that provide the academic foundation of NROTC leadership development. The purpose of this capstone course is to provide future naval leaders with a sound moral leadership foundation for “real life” military decision making. Integrates an intellectual exploration of Western moral traditions and ethical philosophy with military leadership, core values, professional ethics, the Uniform Code of Military Justice, and Navy regulations. Combining ethical theory and leadership discussions with current military events will prepare students for the role and responsibilities of leadership in the naval service.
Prerequisites: NS 211 with C- or better

NS 421. FUNDAMENTALS OF MANEUVER WARFARE. (5 Credits)
A detailed look at broad aspects of warfare and their interactions with maneuver warfare doctrine, with a focus on the United States Marine Corps. Throughout the course there is a strong focus on leadership, as the fundamental purpose of this course is to develop the skills, knowledge, leadership background, and mindset necessary for a successful Marine Corps Officer. This class is open to all students; however, most topics and concepts of this class are intended to professionally develop future United States Marine Corps officers.
Prerequisites: NS 321 with D- or better
New Media Communications (NMC)

NMC 100. *NEW MEDIA AND CULTURE. (3 Credits)
Provides students with the basic critical skills to analyze the cultural, social, and political impact of new media technologies, new media texts, and new media institutions. Students will be exposed to a variety of social scientific and humanistic conceptual approaches to analyzing new media and culture. Special emphasis will be placed on historical analyses of how new media have shaped culture, as well as how culture has shaped new media. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

NMC 101. *INTRODUCTION TO NEW MEDIA COMMUNICATIONS. (3 Credits)
Principles of new media communications. Perspectives on the communications media. How the communications media operate and how they interact with society.
Attributes: CPSI – Core, Pers, Soc Proc & Inst

NMC 183. INTRODUCTION TO MEDIA PRODUCTION. (3 Credits)
Provides core competency in media production: an introduction to audio and video production, and the elements of the media production and post-production processes.

NMC 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 240. SURVEY OF SOCIAL MEDIA. (3 Credits)
Social media are curiously positioned as being both emergent media and convergent media—they function because of the coalescence of existing media forms and the creation of new ones. This class will use multiple perspectives to explore the past, present, and future of social media.
Prerequisites: NMC 101 with C- or better

NMC 241. APPLIED MEDIA AESTHETICS. (4 Credits)
Principles of visual composition, sequential imagery, interactive design, narrative structure, and cinematic language as they relate to digital communication arts and visualization. Provides core competencies in introductory digital communication arts tools.
Prerequisites: NMC 101 with C- or better

NMC 245. CULTURAL ANALYTICS AND DATA SCIENCE. (3 Credits)
Computational approaches to cultural research have changed what it means to work with media today. This course provides a foundation in data science tailored for work in social and cultural research including basic work in natural language processing, social network analysis, and information visualization.

NMC 255. INTRODUCTION TO SOUND DESIGN. (4 Credits)
The principals and practices of sound design for motion pictures, television and radio. Through reading, viewing, listening and discussion, students will learn the art and science of sound design. Topics include the soundtrack and film narrative—basic terms and concepts; narrative, psychological and emotive functions of sound design; components of the soundtrack—dialogue, music and sound effects; sound design process—recording, editing, mixing and exhibition.
Prerequisites: NMC 101 with C- or better

NMC 260. NEW MEDIA FUTURES. (3 Credits)
Historical context and current perspectives on the various aspects of new multimedia communications, including linear and nonlinear or time-based and interactive media. Primary topics include digital cinema (compositing and nonlinear access), visual music, information visualization, interactive narrative, and virtual space.
Prerequisites: NMC 101 with C- or better

NMC 279. MEDIA LITERACY. (3 Credits)
From the days of cave paintings to our current digital world, we have told stories and created mythologies that guided our collective, daily actions. Using a critical approach, we will analyze various different media to shed light on the underlying structure that shapes our understandings of gender, ethnicity, the self, and our everyday practices as citizens and media consumers.

NMC 280. GLOBAL MEDIA. (3 Credits)
Explores theoretical and practical concepts of global media. Both historical and contemporary perspectives on the topic are addressed, particularly as they relate to cultural autonomy, political rights, social justice, communication flow debates, media systems of different world regions, global representations in U.S. media, and developments in global technology and economic media developments.

NMC 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 301. *WRITING FOR THE MEDIA PROFESSIONAL. (3 Credits)
Fundamentals of gathering information, evaluating information, writing information of the media and editing media content in written form.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: NMC 101

NMC 302. REPORTING. (3 Credits)
An introduction to the practices, procedures, techniques, and organizational structures of basic news gathering and writing.
Equivalent to: WR 301
Recommended: WR 201

NMC 305. COPYEDITING. (3 Credits)
Copyreading, headline writing, newspaper layout and design.
Equivalent to: WR 305

NMC 306. ART AND CULTURE CONTENT CREATION. (3 Credits)
Explores various forms of the arts and culture using criticism/reviewing/feature writing’s forms, principles and ethics. Encourages students to be artful in response, given certain time and space boundaries, but also to discuss pushing the boundaries, exploding those boundaries and doing excellent, artful creation in response to the arts that affect our lives.

NMC 311. INTRODUCTION TO NONPROFIT MANAGEMENT. (3 Credits)
Introduction to the principles of effective nonprofit management and lays a foundation for future leaders and managers in the nonprofit sector. Focuses on historical perspectives, ethics, governance and leadership, legal structure and standards, financial management, strategic planning principles, fundraising principles, volunteer management, marketing and communications, and the future of the nonprofit sector.

NMC 320. HISTORY OF TELECOMMUNICATIONS. (3 Credits)
A historical overview of the telecommunications industry. The goal is to understand how the industry got where it is today and, by analyzing principles, events, and trends, suggest what directions it may take in the future. The emphasis is on constructing a causal chronology, interrelating developments in technology, organization, and structure of the industry. This course will focus on the technological developments in the industry.
Prerequisites: NMC 101 with C- or better and NMC 260 [C-]
Recommended: WR II completed with a passing grade.
NMC 321. HISTORY OF BROADCASTING. (3 Credits)
The technological, economic and corporate, legal and political, artistic, and social developments that shaped American broadcasting in the 20th century are examined. Implications for the future of broadcasting are addressed as well.
Prerequisites: NMC 260 with C- or better
Recommended: WR II completed with a passing grade.

NMC 322. LANDMARKS IN MEDIA CONTENT. (3 Credits)
Introduces students to media content that represents advances in the art and science of creative use of media technology. Some of these advances were recognized immediately, some only after time had passed.
Prerequisites: NMC 101 with C- or better and NMC 260 [C-]
Recommended: WR II completed with a passing grade.

NMC 330. THE MEANING OF VIDEO GAMES. (3 Credits)
Examines approaches to understanding the experience of playing video games, including the role of storytelling in diverse games, the relationship between the player and the game, the game as art, and intersections between games and real life.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 340. SOCIAL MEDIA STRATEGY. (3 Credits)
Designing systems of interaction is important for understanding how people come to be a part of social networks. Students will participate in a series of simulation games that will explore the dimensions of the interaction between publics and social networks, culminating in an original research project.
Prerequisites: NMC 240 with C- or better and NMC 260 [C-]
Recommended: NMC 301

NMC 341. MEDIA SPIN AND DECEPTION DETECTION. (3 Credits)
Examines common ways media is used to deceive, and how media scholars and creators can avoid falling prey to spinners, platformed prevaricators, and purveyors of ‘fake news’ using knowledge of production techniques, logic, and other skills.
Prerequisites: NMC 101 with C- or better and NMC 260 (may be taken concurrently) [C-]

NMC 349. VIDEO ART. (4 Credits)
Studio course in video art and time-based media projects. Emphasis on experimental approaches to video art in a contemporary art context, linear and non-linear video production and the projection and screening of video art projects. Introduction to the history of video art as an art form. Lec/lab. CROSSLISTED as ART 349/NMC 349.
Prerequisites: ART 222 with C- or better and ART 263 [C-]
Equivalents to: ART 349
This course is repeatable for 8 credits.

NMC 351. NEW MEDIA VISUALIZATION. (4 Credits)
Principles of spatial design, interactive design and immersive storytelling as they relate to Virtual, Augmented and Mixed Reality (collectively referred to as Extended or X-Reality). Additional topics include the history and current applications of X-Reality technology.
Prerequisites: NMC 101 with C- or better

NMC 355. APPLIED SOUND DESIGN. (4 Credits)
Technical and theoretical application of placing sound in relation to moving image. Concepts and terminology will focus on the physical anatomy of sound and how manipulation changes the perception of sound. Topics include recording environments and monitoring sound; dialogue, voice over and ADR; sound effects and Foley art; and music underscoring.
Prerequisites: NMC 255 with C- or better and NMC 260 [C-]

NMC 356. PODCAST PRODUCTION. (3 Credits)
An intermediate-level production class in which we will develop, launch, distribute, and maintain professional-quality podcasts and use podcasting tools and resources for other storytelling enterprises.
Prerequisites: NMC 255 with C- or better

NMC 380. PRE-PRODUCTION. (4 Credits)
Focuses on pre-production or the planning phase of multimedia production, which includes concept development, scriptwriting, storyboarding, budgeting, and talent/location scouting. Class projects emphasize brainstorming, story concept/structure, conceptual art, storyboards, animatics, and interactive design. Class examines narrative structure and the languages of graphic design, cinema, and interactive story. Lec/studio.
Prerequisites: NMC 260 with C- or better

NMC 382. STUDIO AND MULTICAMERA PRODUCTION. (4 Credits)
Proficiency in organizing, producing, directing, and evaluating television programs using multicamera studio techniques, including graphics, set design, audio for television and digital video production, and lighting. Emphasis on bringing ideas from conception to realization in a studio setting. Lec/lab.
Recommended: NMC 101

NMC 383. FIELD PRODUCTION. (4 Credits)
Development of the technical abilities and conceptual approaches to audio, film, video and multimedia production. Emphasis on single-camera production techniques and concepts. Students will begin the study of post-production process. Students will also begin to study lighting and audio as they relate to single-camera field production.
Prerequisites: NMC 380 with C- or better
Recommended: NMC 351

NMC 385. FOUNDATIONS IN MOTION DESIGN. (4 Credits)
Explores theoretical and applied processes in foundational motion design. Through the creation of assets, applied visual styles and animated compositions students investigate the impact of motion in digital storytelling. Applied principles of motion include timing, rhythm, pace, exaggeration, anticipation and balance through stop motion, rotoscope and key frame animation techniques.
Prerequisites: NMC 101 with C- or better and NMC 241 [C-] and NMC 260 [C-] and NMC 380 [C-]

NMC 388. SOCIAL MEDIA AND INTERPERSONAL RELATIONSHIPS. (3 Credits)
Examines how individuals build and maintain close relationships through new media and social networks. Currently, scholars are seeing a shift in how individuals self-report building close relationships, as people use elements of new media more and more frequently. Designed to look into the similarities and differences of these relationships as compared to face-to-face relationships. CROSSLISTED as COMM 388/NMC 388.
Equivalents to: COMM 388

NMC 392. WEB DESIGN AND PROGRAMMING. (3 Credits)
Web apps are applications that are loaded as web pages. They can store data locally and continue to function while offline. In this hands-on class, students will create web apps that run on smart phones. No prior programming skills are required. Programming concepts that are required to create interactive web apps will be covered in this class.
Prerequisites: NMC 260 with C- or better
NMC 393. SERVER SIDE PROGRAMMING. (3 Credits)
Create websites that focus on the server side. Server side website can store or retrieve data from users. In this hands-on class, students will create server side websites. No prior programming skills are required. Programming concepts that are required to create interactive server side websites will be covered in this class.
Prerequisites: NMC 260 with C- or better
This course is repeatable for 3 credits.
Recommended: NMC 392

NMC 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 403. THESIS/DISSERTATION. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 404. WRITING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

NMC 409. PRACTICUM. (1-16 Credits)
Equivalent to: ART 409
This course is repeatable for 16 credits.

NMC 410. INTERNSHIP. (1-16 Credits)
Recommended: NMC 101

NMC 418. VIRAL CONTENT. (3 Credits)
Online media is often filled with memes, likes, shares, tweets and even hilarious cat videos. Companies like Buzzfeed exist to create, maintain and drive traffic to content. In 2015, collectively the top 10 YouTube content creators made 70.5 million dollars. So, what’s the secret to going viral? This class is designed to look at this question by examining the culture of viral content, the social and psychological influences that shape online behavior and the business of creating and spreading viral content. Throughout the term, students will apply these principle concepts in an attempt to make their own viral content.

NMC 419. REFEREE MADNESS IN THE MEDIA. (3 Credits)
Critically examines the history of hemp and marijuana prohibition, issues of propaganda and the media’s role during the transition between prohibition and the current state of reform. The purpose of this course is to better understand the role media plays in shaping our political, cultural and personal experiences. For students, this knowledge is invaluable for analysis, evaluation and critical thinking skills. The framework of this class is based on four modules: ‘History of Marijuana Prohibition’, ‘Marijuana, Media and Culture’, ‘Medicinal Marijuana Movement’ and ‘Legalizing Marijuana Campaigns’.

NMC 421. DIFFUSION OF INNOVATIONS. (3 Credits)
An introduction to old and emerging theories that explain the spread of innovative ideas and technologies among members of a society, emphasizing the role of communication processes and the special problems for diffusion in communication technology.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 425. LATINOS IN THE MEDIA. (3 Credits)
Examines the sociohistorical context for the underrepresentation of Latinos in mainstream media, the narrow roles and issues ascribed to Latinos and the ways in which media moguls attempt to attract Latino consumers. Focus on Latino filmmakers, actors, and writers as they rewrite traditional scripts to create a vibrant, multifaceted picture of Latinos in the U.S. today.
Prerequisites: NMC 101 with D- or better

NMC 427. *DIGITAL PORNOGRAPHY. (3 Credits)
Exploration of the prominent role pornography plays in digital communication innovation globally including the examination of social consequences; diffusion of technology, business models and economic impact; legal, ethical, and moral issues; and community health and well-being. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

NMC 430. MEDIA THEORY. (3 Credits)
Specifies the concepts, hypotheses, and theoretical paradigms that have characterized the study of media since the early 20th century. The evolution of theory as new media has changed the media economy is emphasized, as well as the need for new concepts to describe phenomena unique to the Internet era (concepts such as .
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 433. NEW MEDIA STORY TELLING. (3 Credits)
Students will study and develop storytelling methods using new media communications technology. Storytelling will focus on telling stories using non-linear, interactive, multidimensional, multi-sensory, multimedia techniques.
Recommended: NMC 101

NMC 435. MEDIA EFFECTS. (3 Credits)
Reviews the potential for media technology and media content to influence the beliefs and behaviors of individuals. The media’s ability to bring about specific changes in people’s attitudes, values, political agendas, purchasing habits, and jury decisions are discussed. The impact of new media’s interactive technology and content on people’s beliefs and behaviors is emphasized.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 437. NEW MEDIA AND SOCIETY. (3 Credits)
Traces the impact of new media—from the telegraph to the Internet—on American society. Emphasizes the way that existing social institutions (e.g., schools and churches) and opinion leaders (e.g., presidents and scholars) greeted the arrival of new media with an increasingly predictable mixture of fear and euphoria. Social changes such as the westward expansion of the U.S. in the 19th century, the arrival of immigrants in the late 19th and early 20th centuries, and the rise of youth culture in the mid-20th century are discussed in terms of their connection to developments in the technology and structure of media. The integration of Internet-based services into contemporary American society is the focus of one-half of the course.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101
NMC 440. MEDIA MANAGEMENT. (3 Credits)
Principles of management and their application to new media. The practice of new media management including personnel, programming, sales and promotions. Students will gain an understanding of the business side of the media industries. Students will also develop the analytical methods and problem solving techniques used in the management decision-making process as they relate to the mass media. Students will study the media of radio, broadcast television, cable television, DBS, MMDS, SMATV, satellite, telephony, Internet, film, the recording industry, advertising and public relations, as well as emerging media businesses.
Prerequisites: NMC 301 with C- or better

NMC 441. MEDIA ENTREPRENEURSHIP. (3 Credits)
Studies the entrepreneurial process as it relates uniquely to the arts and sciences of new media. Students will study the basic entrepreneurial processes of law, finance, accounting, organizational structure, budgeting, business plans, market analyses, taxes, licensing, and insurance as they relate to new media enterprises. Students will also study the sales/revenue generation side of new media ventures.
Prerequisites: NMC 301 with C- or better

NMC 461. TRANS-MEDIA PUBLISHING I: CREATING IP. (4 Credits)
Students develop an exploitable intellectual-property storyworld suitable for trans-media franchise development, and anchor it with a genre-fiction novelette of at least 10,000 words.
Prerequisites: NMC 260 with C- or better and NMC 301 [C-]

NMC 462. TRANS-MEDIA PUBLISHING II: EXPLOITING IP. (3 Credits)
Students exploit intellectual-property story franchises (usually developed in NMC 461) into trans-media suites of storytelling assets, choosing from among various media such as video, e-book, audiobook, podcasting, boardgames, iOS apps.
Prerequisites: NMC 260 with C- or better and NMC 301 [C-]

NMC 470. MEDIA LAW. (3 Credits)
The relevant laws and regulations that govern the mass media; the participants in the law making process; the analytical methods and problem solving techniques used in the law making process; the laws and policies affecting journalists. Issues such as libel, privacy, obscenity, indecency, fair trial/free press and copyright are covered.
Prerequisites: NMC 301 with C- or better

NMC 471. TELECOMMUNICATIONS POLICY. (3 Credits)
Covers past and present telecommunications policy. Examines the agencies that govern the telecommunications industry, including the Federal Communications Commission. Studies the differences and similarities between the regulations associated with public and private telecommunications systems and services. Students will gain knowledge of telecommunications industry ownership regulations, including antitrust regulation of the telecommunications industry.
Prerequisites: NMC 301 with C- or better

NMC 481. COMPOSING AND DIGITAL EFFECTS. (4 Credits)
Explores compositing and digital effects as production techniques in digital storytelling. This course explores several compositing techniques and workflow options for digital manipulation of moving image content. Topics include green screen extraction, motion and camera tracking, rotoscoping, and 2D/3D workflows.
Prerequisites: NMC 101 with C- or better and NMC 241 [C-] and NMC 260 [C-] and NMC 380 [C-]

NMC 482. DOCUMENTARY. (4 Credits)
Theory and production of the documentary genre. The class covers all stages of producing a documentary film from the idea through development, marketing, planning, shooting, editing, and post-production. Lec/lab.
Prerequisites: NMC 383 with C- or better
Recommended: NMC 351 and NMC 380

NMC 483. NEW MEDIA 3-D. (4 Credits)
Hands-on introduction to the world of 3-D computer modeling and animation, including investigations of light, texture, form, spatial design and motion. Course includes discussions of professional and artistic practice and critique of student and professional work. Lec/lab.
Equivalent to: NMC 485

NMC 484. NEW MEDIA ANIMATION. (4 Credits)
An in-depth theoretical and hands-on investigation of advanced animation tools and techniques used for educational, scientific, entertainment, and expressive communication projects. Tools and techniques covered include motion capture (full body, face, hand), automated lip-sync dialogue processing, dynamic simulation, particle motion, and other simulation or performance-based animation approaches. Students will work individually and in teams to explore the communicative and creative possibilities of the described technologies.
Recommended: NMC 101

NMC 487. VIRTUAL MEDIA. (4 Credits)
Explores the topics of interactivity in virtual space from conceptual, historical, theoretical, and practical perspectives. The course will compare and contrast real world physical space with virtual space in an attempt to create a virtual world designed with an audience in mind. Color, light, form, motion, and sound will all be examined and applied throughout this course. Lec/lab.
Prerequisites: NMC 101 with C or better and NMC 483 (may be taken concurrently) [C]

NMC 490. MEDIA ETHICS. (3 Credits)
Exploration of the ethical issues surrounding new media communications. Topics include professionalism in journalism, new media visual production, new media management, advertising, film, and public relations. Topics also include new media’s relationship with society, violence in the media, and sex in the media.
Prerequisites: NMC 301 with C- or better
Recommended: NMC 101

NMC 493. MEDIA AND POWER. (3 Credits)
Explores the relationship between media and power. From papyrus and the pencil to the printing press, the telegraph, and GPS, media technologies have been central to the analysis and governance of populations. Special attention will be paid to how media technologies have allowed for the exertion, extension, and resistance of power.
Prerequisites: NMC 301 with C or better

NMC 498. ADVANCED COLLABORATIVE EXPERIENCE. (3-4 Credits)
Senior-level course designed to integrate the skills and knowledge obtained through NMC course work into a group research, group project, and/or group production that will be useful to students for their professional portfolio or serve as the basis for academic publication. Topic changes per term.
Prerequisites: NMC 101 with C- or better and NMC 301 [C-]
This course is repeatable for 4 credits.

NMC 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Nuclear Science & Engineering (NSE)

NSE 114. INTRO TO NUCLEAR ENGINEERING AND RADIATION HEALTH PHYSICS I. (3 Credits)
Introduction to the nuclear engineering and radiation health physics fields; problem-solving techniques; careers in the nuclear industry; nuclear history; elementary nuclear and reactor physics; basic nuclear fission and fusion theory; reactor types; nuclear safety; nuclear fuel cycle; and radiation protection.
Equivalent to: NE 114, RHP 114

NSE 115. INTRO TO NUCLEAR ENGINEERING AND RADIATION HEALTH PHYSICS II. (3 Credits)
Introduction to the nuclear engineering and radiation health physics fields; problem-solving techniques; careers in the nuclear industry; nuclear history; elementary nuclear and reactor physics; basic nuclear fission and fusion theory; reactor types; nuclear safety; nuclear fuel cycle; and radiation protection.
Equivalent to: NE 115, RHP 115

NSE 233. MATHEMATICAL METHODS FOR NSE. (3 Credits)
Development and application of analytical and numerical methods with applications to problems in the NE/RHP field. Major topics will include solution of ODEs and systems of ODEs, root finding techniques and numerical integration and differentiation. Major applications will include solution of the Bateman Equations and solution of the diffusion equation.
Prerequisites: MTH 256 with C or better or MTH 256H with C or better
Equivalent to: MTH 253, RHP 253

NSE 234. NUCLEAR AND RADIATION PHYSICS I. (3 Credits)
Relativistic dynamics; basic nuclear physics; basic quantum mechanics; radioactivity; electromagnetic waves; interaction of ionizing radiation with matter; cross sections; basic atomic structure.
Prerequisites: MTH 251 with C or better or MTH 251H with C or better
Equivalent to: NE 234, RHP 234

NSE 235. NUCLEAR AND RADIATION PHYSICS II. (3 Credits)
Radioactivity; radioactive decay modes; decay kinetics, interaction of neutrinos with matter; nuclear reactions; fission and fusion basics; cross sections.
Prerequisites: (NSE 234 with C or better or NE 234 with C or better or RHP 234 with C or better) and (MTH 252 [C] or MTH 252H [C])
Equivalent to: NE 235, RHP 235

NSE 236. NUCLEAR RADIATION DETECTION AND INSTRUMENTATION. (4 Credits)
Principles and mechanisms underlying nuclear radiation detection and measurements; operation of nuclear electronic laboratory instrumentation; application of gas-filled, scintillation and semiconductor laboratory detectors for measurement of alpha, beta, gamma, and neutron radiation; experimental investigation of interactions of radiation with matter. Lec/lab.
Prerequisites: NSE 235 with C or better or NE 235 with C or better or RHP 235 with C or better
Equivalent to: NE 236, RHP 236

NSE 311. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, moment and the second law of thermodynamics are included. CROSSLISTED as ME 311/NSE 311.
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C])
Equivalent to: ME 311, ME 311H, NE 311, NE 311H, NSE 311H

NSE 311H. INTRODUCTION TO THERMAL-FLUID SCIENCES. (4 Credits)
Basic concepts of fluid mechanics, thermodynamics and heat transfer are introduced. Conservation of mass, energy, moment and the second law of thermodynamics are included. CROSSLISTED as ME 311/NSE 311.
Attributes: HNRS – Honors Course Designator
Prerequisites: (ENGR 212 with C or better or ENGR 212H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 311, ME 311H, NE 311H, NSE 311H

NSE 312. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Prerequisites: (NSE 311 with C or better or NSE 311H with C or better or NE 311 with C or better or NE 311H with C or better or ME 311 with C or better or ME 311H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 312, ME 312H, NE 312H, NSE 312H

NSE 312H. THERMODYNAMICS. (4 Credits)
Exergy destruction, machine and cycle processes, law of corresponding states, non-reactive gas mixtures, reactive mixtures, thermodynamics of compressible fluid flow. CROSSLISTED as ME 312/NSE 312.
Attributes: HNRS – Honors Course Designator
Prerequisites: (NSE 311 with C or better or NSE 311H with C or better or NE 311 with C or better or NE 311H with C or better or ME 311 with C or better or ME 311H with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: ME 312, ME 312H, NE 312H, NSE 312H

NSE 319. *SOCIETAL ASPECTS OF NUCLEAR TECHNOLOGY. (3 Credits)
Description and discussion of nuclear-related issues as they impact society. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: NE 319

NSE 331. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Prerequisites: (MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C] and (MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C]))
Equivalent to: ME 331, ME 331H, NE 331, NE 331H, NSE 331H

NSE 331H. INTRODUCTORY FLUID MECHANICS. (4 Credits)
Introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics. CROSSLISTED as ME 331/NSE 331.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 254 with C or better or MTH 254H with C or better) and (MTH 256 [C] or MTH 256H [C] and (ENGR 212 [C] or ENGR 212H [C] and (MTH 256 [C] or MTH 256H [C]))
Equivalent to: ME 331, ME 331H, NE 331, NE 331H, NSE 331H
NSE 332. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C] or ME 311 [C] or ME 311H [C] and (ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C])
Equivalent to: ME 332, ME 332H, NE 332, NE 332H, NSE 332H

NSE 332H. HEAT TRANSFER. (4 Credits)
A treatment of conductive, convective and radiative energy transfer using control volume and differential analysis and prediction of transport properties. CROSSLISTED as ME 332/NSE 332.
Attributes: HNRS – Honors Course Designator
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (ENGR 212 [C] or ENGR 212H [C]) and (NSE 311 [C] or NSE 311H [C] or NE 311 [C] or NE 311H [C] or ME 311 [C] or ME 311H [C] and (ME 331 [C] or ME 331H [C] or NSE 331 [C] or NSE 331H [C] or NE 331 [C] or NE 331H [C])
Equivalent to: ME 332, ME 332H, NE 332, NE 332H, NSE 332H

NSE 401. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: NE 401
This course is repeatable for 99 credits.

NSE 403. THESIS/DISSERTATION. (1-16 Credits)
Equivalent to: NE 403
This course is repeatable for 16 credits.

NSE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: NE 405
This course is repeatable for 16 credits.

NSE 406. PROJECTS. (1-16 Credits)
Equivalent to: NE 406
This course is repeatable for 16 credits.

NSE 407. SEMINAR. (1 Credit)
Graded P/N.
Equivalent to: RHP 407
This course is repeatable for 16 credits.

NSE 410. INTERNSHIP. (1-12 Credits)
Supervised technical work experience at approved organizations. Graded P/N.
Equivalent to: RHP 410
This course is repeatable for 12 credits.

NSE 415. NUCLEAR RULES AND REGULATIONS. (2 Credits)
An introduction to the key nuclear regulatory agencies; major nuclear legislation; current radiation protection standards and organizations responsible for their implementation. Offered alternate years.
Prerequisites: NSE 236 with C or better
Equivalent to: NE 415, RHP 415
Recommended: NSE 481 or NE 481 or RHP 481

NSE 429. SELECTED TOPICS IN NUCLEAR ENGINEERING. (1-3 Credits)
Topics associated with nuclear engineering not covered in other undergraduate courses; topics may vary from year to year.
Equivalent to: NE 429
This course is repeatable for 45 credits.

NSE 435. RADIATION SHIELDING AND EXTERNAL DOSIMETRY. (4 Credits)
Theoretical principles of shielding for neutron and gamma radiation; external dosimetry fundamentals for neutrons, photons, and charged particles; applications to problems of practical interest; analytical, numerical, and computer solutions emphasized.
Prerequisites: (NSE 234 with C or better or NE 234 with C or better or RHP 234 with C or better) and (NSE 235 [C] or NE 235 [C] or RHP 235 [C] and (NSE 481 [C] or NE 481 [C] or RHP 481 [C])
Equivalent to: NE 435

NSE 440. NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT. (4 Credits)
Mining, milling, conversion, enrichment, fuel fabrication, reprocessing, and waste management of nuclear fuel, including disposal of low- and high-level radioactive waste.
Prerequisites: NSE 235 with C or better or NE 235 with C or better or RHP 235 with C or better
Equivalent to: NE 440

NSE 450. PRINCIPLES OF NUCLEAR MEDICINE. (3 Credits)
Basic principles of nuclear medicine; detectors; radiopharmaceutical; dosimetry; imaging procedures.

NSE 451. NEUTRONIC ANALYSIS I. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory, one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions.
Prerequisites: (MTH 256 with C or better or MTH 256H with C or better) and (NSE 235 [C] or NE 235 [C] or RHP 235 [C] and (NSE 333 [C] or NE 333 [C] or RHP 333 [C])
Equivalent to: NE 451

NSE 452. NEUTRONIC ANALYSIS II. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory, one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions. Lec/lab.
Prerequisites: NSE 451 with C or better or NE 451 with C or better
Equivalent to: NE 452

NSE 455. REACTOR OPERATOR TRAINING I. (3 Credits)
The Oregon State University TRIGA reactor Operator Training I class is one of a two-course series. Students interested in participating in this course are expected to enroll in both the NSE 455/NSE 555 and NSE 456/NSE 556 classes taught during spring and summer terms. Students successfully completing the NSE 455/NSE 555 and NSE 456/NSE 556 series will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Prerequisites: (NSE 236 with C or better or NE 236 with C or better or RHP 236 with C or better) and (MTH 256 [C] or MTH 256H [C])
Equivalent to: NE 455
NSE 456. REACTOR OPERATOR TRAINING II. (4 Credits)
The Oregon State University TRIGA reactor Operator Training II class is one of a two-course series. Students interested in participating in this course must have already taken and successfully passed NSE 455/ RHP 455. Students successfully completing NSE 455/RHP 455 will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.  
**Prerequisites:** NSE 455 with C or better or NE 455 with C or better  
**Equivalent to:** NE 456

NSE 457. NUCLEAR REACTOR LABORATORY. (2 Credits)  
Experimental investigation of the principles of nuclear reactor operation. Use of the OSU TRIGA Reactor and other laboratory facilities. Preparation and presentation of laboratory reports. Lec/lab.  
**Prerequisites:** (NSE 451 with C or better or NE 451 with C or better or NSE 551 with C or better or NSE 551 with C or better or NSE 551 with C or better or NSE 551 with C or better) and (NSE 452 [C] or NSE 552 [C] or NE 552 [C])  
**Equivalent to:** NE 457

NSE 467. NUCLEAR REACTOR THERMAL HYDRAULICS. (4 Credits)  
Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single- and two-phase flow behavior. Advanced thermal hydraulic computer codes.  
**Prerequisites:** ME 332 with C or better or ME 332H with C or better or NSE 332 with C or better or NSE 332H with C or better or NE 332 with C or better or NE 332H with C or better  
**Equivalent to:** NE 467

NSE 473. NUCLEAR REACTOR SYSTEMS ANALYSIS. (3 Credits)  
Analysis of nuclear light water reactor (pressurized water reactor and boiling water reactor) design and operation, including the nuclear steam supply system, engineered safety features and balance of plant systems; regulatory design requirements; industry standards; plant engineering and instrumentation drawings. Advanced reactor system designs.  
**Prerequisites:** NSE 452 with C or better or NE 452 with C or better  
**Equivalent to:** NE 467

NSE 474. *NUCLEAR SYSTEMS DESIGN I. (4 Credits)  
Part I of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills. (Writing Intensive Course)  
**Attributes:** CWIC – Core, Skills, WIC  
**Prerequisites:** NSE 481 with C or better  
**Equivalent to:** NE 474, RHP 474

NSE 475. *NUCLEAR SYSTEMS DESIGN II. (4 Credits)  
Part II of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills. (Writing Intensive Course)  
**Attributes:** CWIC – Core, Skills, WIC  
**Prerequisites:** (NSE 452 with C or better or NE 452 with C or better) and (NSE 474 [C] or NE 474 [C] or RHP 474 [C])  
**Equivalent to:** RHP 475

NSE 481. RADIATION PROTECTION. (4 Credits)  
Fundamental principles and theory of radiation protection; regulatory agencies, dose units; source of radiation; biological effects and risk; dose limits; applications of external and internal dosimetry; shielding and atmospheric dispersion.  
**Prerequisites:** NSE 235 with C or better or NE 235 with C or better or RHP 235 with C or better  
**Equivalent to:** NE 481, RHP 481

NSE 483. RADIATION BIOLOGY. (3 Credits)  
Biological effects of ionizing radiation at the molecular, cellular, and organismal levels with emphasis on vertebrates; both acute and chronic radiation effects are considered.  
**Prerequisites:** NSE 481 with C or better or RHP 481 with C or better or MP 481 with C or better  
**Equivalent to:** MP 483

NSE 488. RADIOECOLOGY. (3 Credits)  
Radiouctides in the environment: their measurement and identification, uptake and transfer through food chains. Effect of radiation on natural populations of plants and animals.  
**Prerequisites:** NSE 481 with C or better or RHP 481 with C or better or NE 481 with C or better  
**Equivalent to:** RHP 488

NSE 499. SPECIAL TOPICS. (0-16 Credits)  
This course is repeatable for 16 credits.  
**Equivalent to:** NE 499

NSE 501. RESEARCH. (1-16 Credits)  
This course is repeatable for 99 credits.  
**Equivalent to:** MP 501

NSE 503. THESIS. (1-16 Credits)  
This course is repeatable for 99 credits.  
**Equivalent to:** MP 503

NSE 505. READING AND CONFERENCE. (1-16 Credits)  
This course is repeatable for 16 credits.  
**Equivalent to:** MP 505

NSE 506. PROJECTS. (1-16 Credits)  
This course is repeatable for 16 credits.  
**Equivalent to:** MP 506

NSE 507. SEMINAR. (1 Credit)  
Graded P/N.  
**Equivalent to:** MP 507

NSE 509. INTERNSHIP. (1-12 Credits)  
Supervised technical work experience at approved organizations. Graded P/N.  
**Equivalent to:** MP 510

NSE 510. NUCLEAR RULES AND REGULATIONS. (2 Credits)  
An introduction to the key nuclear regulatory agencies; major nuclear legislation; current radiation protection standards and organizations responsible for their implementation. Offered alternate years.  
**Equivalent to:** NE 515, RHP 515
Nuclear Science & Engineering (NSE)

**NSE 516. RADIOCHEMISTRY. (4 Credits)**

Selected methods in radiochemical analysis. Actinide chemistry, activation analysis, radionuclide solvent extraction, and microbial reactions with radionuclides. Designed for majors in chemistry, chemical engineering, nuclear engineering, and radiation health physics. Lec/lab.

**Equivalent to:** CH 516/NSE 516

**Prerequisites:** (NSE 531 with C or better or NE 531 with C or better or RHP 531 with C or better) and (NSE 536 [C] or NE 536 [C] or RHP 536 [C])

**Recommended:** Programming experience and previous exposure to numerical methods

**NSE 517. RADIONUCLIDES IN LIFE SCIENCES. (4 Credits)**

Chemistry of actinides and fission products, radioseparations, selected medical generators, radiolabeling of organic molecules. Designed for majors in medical physics, radiation health physics, chemistry, pharmacy.

**Prerequisites:** (NSE 531 with C or better or NE 531 with C or better or RHP 531 with C or better) and (NSE 536 [C] or NE 536 [C] or RHP 536 [C])

**Equivalent to:** MP 517, RHP 517

**NSE 519. RADIOCHEMICAL ANALYSIS. (4 Credits)**

Hands-on learning of radiochemistry, practical training with open radiation sources for preparation of irradiation targets, counting samples from contaminated soils or separation of medical radionuclides. Fundamentals of chemical dosimetry are also covered. Designed for a broad range of majors in chemistry, nuclear engineering, radiation health physics, radiocology, chemical and environmental engineering. Lec/lab.

The lecture part of the course also is delivered online as video stream via Canvas.

**Prerequisites:** NSE 536 with C or better or NE 536 with C or better or RHP 536 with C or better

**Recommended:** NSE 516

**NSE 521. RADIOLOGICAL ANATOMY AND PHYSIOLOGY. (4 Credits)**

Anatomy and physiology with correlating images for use by medical physicists, therapists, dosimetrists. This course adheres to the AAMD requirements for Cross Sectional Anatomy.

**Equivalent to:** MP 521, RHP 521

**NSE 522. NUCLEAR SECURITY SCIENCE. (4 Credits)**

Explores the nuclear fuel cycle from the perspective of nuclear security and safeguards and in the context of current international nuclear policies. Nuclear threats are balanced with the past history of nuclear weapons use, current nonproliferation technology, and the future international growth of the nuclear industry. Critical thinking will be assessed by way of in-class discussions, journal article reviews, written analysis of fuel cycle signatures, and conducting research. Signatures including radiological and morphological characteristics of nuclear material is introduced as well as the techniques for the detection of special nuclear materials.

**NSE 525. NUCLEAR SECURITY SYSTEM DESIGN. (3 Credits)**

Studies the science and engineering associated with the design, evaluation, and implementation of systems to secure nuclear and radiological materials. Topics include adversary characterization, target categorization and the consequences of failure to protect targets, detection and delay technologies, on-site and off-site response and response strategies, insider threat evaluation, and mathematical methods for evaluating risk due to the threat and the security system design.

Students will become familiar with the components of a sustainable nuclear security program and their interconnections, and learn about the planning of nuclear security activities at both the state and facility level.
NSE 537. DIGITAL RADIATION MEASUREMENT AND SPECTROSCOPY. (3 Credits)
Principles of digital spectroscopy; application of digital filters in digital processing of detector pulses; hardware implementation of a typical digital spectrometer; introduction of Field-Programmable Gate Array (FPGA) devices programming a digital spectrometer using Hardware Description Language (VHDL); simulation, synthesis and spectroscopy; experimental design tests and evaluation. Lec/lab.
Prerequisites: NSE 536 with C or better or NE 536 with C or better or RHP 536 with C or better
Equivalent to: NE 537

NSE 539. SELECTED TOPICS IN INTERACTION OF NUCLEAR RADIATION. (1-6 Credits)
Topics associated with interactions of nuclear radiation not covered in other graduate courses; topics may vary from year to year.
Equivalent to: NE 539

NSE 540. NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT. (4 Credits)
Mining, milling, conversion, enrichment, fuel fabrication, reprocessing, and waste management of nuclear fuel, including disposal of low- and high-level radioactive waste.
Equivalent to: NE 540

NSE 541. DIAGNOSTIC IMAGING PHYSICS I. (3 Credits)
An introduction to the production and usage of ionizing radiation in medicine. The course will cover x-ray production, x-ray spectrum, characteristics and manipulation, and how x-rays are utilized to obtain anatomical information in diagnostics imaging. Imaging modalities to be covered in this course are general and portable planar radiography, mammography, and fluoroscopy (including interventional radiography).
Prerequisites: NSE 531 with C or better or MP 531 with C or better or RHP 531 with C or better
Equivalent to: MP 541

NSE 542. DIAGNOSTIC IMAGING PHYSICS II. (3 Credits)
An introduction to Computed Tomography (CT) and Ultrasound (US) imaging, and their applications in medicine. The course will cover x-ray production, detection, and image processing as it relates specifically to CT, as well as general acoustic physics principles and how they are applied to US imaging. Additionally, clinical radiation protection and dosimetry in diagnostic imaging will be taught.
Prerequisites: NSE 531 with C or better or PP 531 with C or better or RHP 531 with C or better
Equivalent to: MP 542

NSE 543. ADVANCED DIAGNOSTIC IMAGING PHYSICS. (3 Credits)
An introduction to the areas of health informatics and magnetic resonance imaging (MRI). The health informatics portion of the course will specifically cover picture archiving and communication systems (PACS), including DICOM standards, data transfer and storage, digital image displays, and clinical implementation of PACS systems. The MRI portion of the course will provide instruction on the physical principles behind nuclear magnetic response (NMR) and how these phenomenon are exploited in MRI. Advanced MRI techniques and applications, along with clinical testing requirements, will also be covered.
Prerequisites: NSE 531 with C or better or MP 531 with C or better or RHP 531 with C or better
Equivalent to: MP 543

NSE 544. NUCLEAR MEDICINE IMAGING. (3 Credits)
An introduction to the uses of radionuclides in medical imaging. The theory and application of detectors and imaging systems in nuclear medicine including collimators, scintillation probes, cameras, SPECT, PET, and hybrid technologies (SPECT/CT, PET/CT, and PET/MRI) will be covered.
Prerequisites: (NSE 541 with C or better or MP 541 with C or better) and (NSE 531 [C] or RHP 531 [C])
Equivalent to: MP 544

NSE 545. DIAGNOSTIC IMAGING PRACTICUM. (3 Credits)
Provides an introduction to the medical physicist's role in a clinical department; an opportunity to integrate principles learned throughout the graduate program as they apply to diagnostic imaging physics. Observations of procedures in radiography, fluoroscopy, ED, OR, interventional radiology, CT, MRI, ultrasound, and nuclear medicine. Experience in regulatory testing of x-ray equipment; observations of testing of CT and other x-ray modalities. Graded P/N.
Prerequisites: (NSE 541 with C or better or MP 541 with C or better) and (NSE 531 [C] or MP 531 [C] or RHP 531 [C])
Equivalent to: MP 545

NSE 549. SELECTED TOPICS IN NUCLEAR FUEL CYCLE ANALYSIS. (1-6 Credits)
Topics associated with the nuclear fuel cycle not covered in other graduate courses; topics may vary from year to year.
Equivalent to: NE 549
This course is repeatable for 45 credits.

NSE 550. PRINCIPLES OF NUCLEAR MEDICINE. (3 Credits)
Basic principles of nuclear medicine; detectors; radiopharmaceutical; dosimetry; imaging procedures.
Equivalent to: RHP 550

NSE 551. NEUTRONIC ANALYSIS I. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions.
Equivalent to: NE 551

NSE 552. NEUTRONIC ANALYSIS II. (3 Credits)
Physical models of neutronic systems; nuclear physics; steady state and transient neutronic system behavior; introductory neutron transport theory; one speed diffusion theory; numerical methods; fast and thermal spectrum calculations; multigroup methods; transmutation and burnup; reactor fuel management; reactivity control; perturbation theory; neutronic laboratory sessions.
Equivalent to: NE 552

NSE 553. ADVANCED NUCLEAR REACTOR PHYSICS. (3 Credits)
Advanced analytic and numerical techniques for the prediction of the neutron population in nuclear reactor systems. Topic will include long characteristic neutron transport, collision probabilities, nodal methods, equivalence theory, and perturbation theory.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 552 [C] or NE 552 [C])
Equivalent to: NE 553
Recommended: Computer programming experience
NSE 555. REACTOR OPERATOR TRAINING I. (3 Credits)
The Oregon State University TRIGA Reactor Operator Training I class is one of a two-course series. Students interested in participating in this course are expected to enroll in both the NSE 455/555 and NSE 456/556 classes taught during spring and summer terms. Students successfully completing the NSE 455/555 and NSE 456/556 series will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Equivalent to: NE 555

NSE 556. REACTOR OPERATOR TRAINING II. (4 Credits)
The Oregon State University TRIGA Reactor Operator Training II class is one of a two-course series. Students interested in participating in this course must have already taken and successfully passed NSE 455/NSE 555. Students successfully completing NSE 456/NSE 556 will culminate their course work with the opportunity to take a certification test proctored by the Nuclear Regulatory Commission.
Prerequisites: NSE 555 with C or better or NE 555 with C or better
Equivalent to: NE 556

NSE 557. NUCLEAR REACTOR LABORATORY. (2 Credits)
Experimental investigation of the principles of nuclear reactor operation. Use of the OSU TRIGA Reactor and other laboratory facilities. Preparation and presentation of laboratory reports. Lec/lab.
Prerequisites: (NSE 551 with C or better or NE 550 with C or better) and (NSE 552 [C] or NE 552 [C])
Equivalent to: NE 557

NSE 559. SELECTED TOPICS IN NUCLEAR REACTOR ANALYSIS. (1-3 Credits)
Topics associated with nuclear reactor theory not covered in other graduate courses; topics may vary from year to year.
Equivalent to: NE 559
This course is repeatable for 45 credits.

NSE 561. NUCLEAR REACTOR SYSTEMS LABORATORY. (3 Credits)
Operational aspects of nuclear reactor systems; neutronic and thermal-hydraulic characterization of nuclear reactors; examination of design basis accident prevention and mitigation; loss of coolant accidents; loss of flow accidents; station blackouts. Lec/lab.
Prerequisites: (NSE 553 with C or better or NE 553 with C or better) and (NSE 567 [C] or NE 567 [C])
Equivalent to: NE 561

NSE 562. RADIATION THERAPY. (3 Credits)
The physics of radiation generation and delivery relevant to the field of clinical radiation oncology. Topics will include external beam radiation therapy; dosimetric calculations; high dose-rate and low dose-rate brachytherapy; electron beam dosimetry and treatment planning; special techniques in radiotherapy; and clinical radiation protection and quality assurance.
Prerequisites: NSE 531 with C or better or MP 531 with C or better or NE 531 with C or better or RHP 531 with C or better
Equivalent to: MP 562

NSE 563. APPLIED RADIATION THERAPY PHYSICS LABORATORY I. (3 Credits)
The applied practice of therapeutic radiation physics for clinical radiation oncology. Topics will include current methodologies in treatment delivery and planning algorithms, best practices and protocols for quality assurance, special techniques in radiotherapy, and oncology.
Prerequisites: NSE 562 with C or better or MP 562 with C or better
Equivalent to: MP 563

NSE 564. APPLIED RADIATION THERAPY PHYSICS LABORATORY II. (3 Credits)
Covers the applied practice of therapeutic radiation physics for clinical radiation oncology. Topics include current methodologies in SRS and ARC QA, treatment planning QA, adaptive radiotherapy, eye plaque brachytherapy and HDR brachytherapy.
Equivalent to: MP 564

NSE 565. APPLIED THERMAL HYDRAULICS. (3 Credits)
Advanced topics in the computational modeling of the hydrodynamic and heat transfer phenomena of nuclear reactors. Steady-state and transient solutions of one-dimensional nuclear reactor thermal hydraulic models. Nuclear reactor behavior analysis during various accident scenarios.
Equivalent to: NE 565

NSE 567. NUCLEAR REACTOR THERMAL HYDRAULICS. (4 Credits)
Hydrodynamics and conductive, convective and radiative heat transfer in nuclear reactor systems. Core heat removal design; critical heat flux, hot spot factors, single- and two-phase flow behavior. Advanced thermal hydraulic computer codes.
Equivalent to: NE 567

NSE 568. NUCLEAR REACTOR SAFETY. (3 Credits)
Focused on probability risk assessment and system reliability analysis techniques applied to nuclear reactor safety. Application of these methods will be performed specifically through examination of neutronics and thermal hydraulic transients, effectiveness of emergency systems, accident prevention and mitigation, and assessment of radioactive release to the environment.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 567 [C] or NE 567 [C])
Equivalent to: NE 568

NSE 569. SELECTED TOPICS IN NUCLEAR REACTOR ENGINEERING. (1-6 Credits)
Advanced nuclear engineering design concepts, reactor systems analysis techniques and innovative nuclear engineering applications. Artificial intelligence and expert system applications to nuclear engineering problems. Topics may vary from year to year.
Equivalent to: NE 569
This course is repeatable for 30 credits.

NSE 573. NUCLEAR REACTOR SYSTEMS ANALYSIS. (3 Credits)
Analysis of nuclear light water reactor (pressurized water reactor and boiling water reactor) design and operation, including the nuclear steam supply system, engineered safety features and balance of plant systems; regulatory design requirements; industry standards; plant engineering and instrumentation drawings. Advanced reactor system designs.
Prerequisites: NSE 552 with C or better or NE 552 with C or better
Equivalent to: NE 573

NSE 574. NUCLEAR SYSTEMS DESIGN I. (4 Credits)
Part I of a two-part series aimed at developing the student's ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills.
Equivalent to: RHP 574
NSE 575. NUCLEAR SYSTEMS DESIGN II. (4 Credits)
Part II of a two-part series aimed at developing the student’s ability to utilize fundamental nuclear and radiation protection skills to transform concepts into practical designs. Design projects involve the integration of neutronics, thermal hydraulics, safety and risk analysis, power production, materials, radiation protection, economic optimization, statistics and other skills.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 552 [C] or NE 552 [C]) and (NSE 574 [C] or NE 574 [C])
Equivalent to: RHP 575

NSE 582. APPLIED RADIATION SAFETY. (4 Credits)
Application of radiation protection as practiced in the fields of nuclear science and engineering; application of health physics principles to reduce health hazards at each of the following stages: design, prevention, assessment, and post-incident. A history of key nuclear regulatory agencies; early and current radiation protection standards and organizations responsible for their formulation; major nuclear legislation; pertinent nuclear rules and regulations and their application. Lec/lab.
Equivalent to: MP 582

NSE 583. RADIATION BIOLOGY. (3 Credits)
Biological effects of ionizing radiation at the molecular, cellular, and organismal levels with emphasis on vertebrates; both acute and chronic radiation effects are considered.
Equivalent to: MP 583

NSE 584. RADIATION BIOLOGY II. (3 Credits)
Application of radiobiological models in radiation therapy. Some background in radiation biology is strongly recommended.
Equivalent to: MP 584, RHP 584

NSE 588. RADIOECOLOGY. (3 Credits)
Radionuclides in the environment: their measurement and identification, uptake and transfer through food chains. Effect of radiation on natural populations of plants and animals.
Equivalent to: RHP 588
Recommended: NSE 481 or RHP 481 or NE 481

NSE 590. INTERNAL DOSIMETRY. (3 Credits)
Further development and more in-depth treatment of internal dosimetry concepts, theoretical basis of energy deposition, biokinetics, and estimation of radiation risk from ingested, inhaled, or injected radionuclides.
Prerequisites: NSE 531 with C or better and NSE 535 [C]
Equivalent to: NE 590, RHP 590

NSE 599. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: MP 599
This course is repeatable for 16 credits.

NSE 601. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: MP 601
This course is repeatable for 99 credits.

NSE 603. THESIS. (1-16 Credits)
Equivalent to: MP 603
This course is repeatable for 999 credits.

NSE 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: MP 601
This course is repeatable for 16 credits.

NSE 606. PROJECTS. (1-16 Credits)
Equivalent to: MP 606
This course is repeatable for 16 credits.

NSE 607. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: MP 607
This course is repeatable for 16 credits.

NSE 610. INTERNSHIP. (1-16 Credits)
Equivalent to: MP 610
This course is repeatable for 16 credits.

NSE 654. COMPUTATIONAL PARTICLE TRANSPORT. (3 Credits)
Properties of and methods for solution of the linear Boltzmann equation for nuclear reactors; spherical and double-spherical harmonics; integral equation methods; Monte Carlo methods.
Prerequisites: (NSE 551 with C or better or NE 551 with C or better) and (NSE 552 [C] or NE 552 [C])
Equivalent to: NE 654

NSE 667. ADVANCED THERMAL HYDRAULICS. (3 Credits)
Advanced topics in single- and two-phase hydrodynamics and heat transfer for nuclear reactors. Two-phase flow patterns, flow instabilities, condensation induced transients, convective boiling heat transfer, and current topics in reactor safety thermal hydraulics. Offered alternate years.
Prerequisites: NSE 567 with C or better or NE 567 with C or better
Equivalent to: NE 667

NSE 699. SPECIAL TOPICS. (0-16 Credits)
Equivalent to: NE 699
This course is repeatable for 16 credits.

NSE 808. WORKSHOP. (1-4 Credits)
Equivalent to: NE 808
This course is repeatable for 16 credits.

Nursing (NUR)

NUR 411. INFORMATICS IN NURSING. (1 Credit)
Provides an overview of nursing informatics as a means to improve information management in healthcare. Consideration of healthcare technologies with ethical and financial criteria in relation to the quality of their outcomes.

NUR 412. TRANSITION TO PROFESSIONAL NURSING. (3 Credits)
Provides an overview of the nursing metaparadigm: client, nurse, health/illness and environment. Nursing theoretical perspectives will be discussed as a foundation for professional nursing practice as care provider and manager of care. Special emphasis will be on the practice of the baccalaureate nurse.

NUR 413. ADVANCED HEALTH ASSESSMENT. (3 Credits)
Builds on previous health assessment knowledge and skills, focusing on comprehensive health assessment skills. Using a lifespan approach, students examine the physical, cultural, psychosocial, spiritual and nutritional variables through the use of health history and health assessment.

NUR 414. NURSING EPIDEMIOLOGY. (3 Credits)
Presents the basic concepts and methods of epidemiology applied to population focused health care and nursing practice. Emphasis is placed on the use of epidemiologic reasoning in deriving inferences about the etiology of health outcomes from population data and in guiding the design of health service programs.
Prerequisites: ST 201 with D- or better
NUR 415. *NURSING PRACTICE IN A MULTICULTURAL SOCIETY. (3 Credits)
Provides an overview of the influence of culture on health care practices and the delivery of nursing care for individuals, groups, and communities. Emphasis is on increasing awareness of culturally diverse nursing care and the impact of cultural beliefs, values, and practices upon health and health care delivery.
Attributes: CPCD – Core, Pers, Cult Diversity

NUR 416. POPULATION-FOCUSED AND COMMUNITY-BASED NURSING PRACTICE I. (4 Credits)
Introduces the concepts and principles of community health and the practice of evidence-based community health nursing. The nursing process is applied to the care of individuals, families, and groups within the community. Emphasis on health promotion and illness prevention. Consideration of community health nursing principles occurs in the 54-hour independent clinical practicum under the supervision of the faculty.
Prerequisites: NUR 413 with C- or better
Recommended: Completion of at least 12 credits in the RN to BSN program

NUR 417. POPULATION-FOCUSED AND COMMUNITY-BASED NURSING PRACTICE II. (6 Credits)
Builds on NUR 416 through the application of the theories and principles of population-focused nursing in a community setting. Emphasis will be on community health measures which promote and maintain the health of the community. Application of community health nursing principles occurs in the 54-hour independent clinical practicum under the supervision of the faculty.
Prerequisites: NUR 416 with C- or better

NUR 418. HEALTH CARE SYSTEM ISSUES IN NURSING PRACTICE. (3 Credits)
Consideration of the current and emerging forces that will affect health care delivery across the health care continuum. Issues related to health-care relevant policy, finance, and regulation, with special attention to the impacts on nursing care will be included.

NUR 419. HEALTH CARE QUALITY IN NURSING PRACTICE. (2 Credits)
Explores strategies that contribute to building a culture of safe, quality nursing practice. The focus is on incorporating quality assessment and improvement strategies as evidence based practice in an interdisciplinary environment.

NUR 420. *NURSING RESEARCH AND EVIDENCE-BASED PRACTICE. (4 Credits)
Overview of the research process and utilization in professional nursing practice. Discussion of evidence-based practice as the foundation for safe, quality care. Reading and interpreting current research, and using writing as a tool for learning on a critical issue in nursing will be the focus of this course. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUR 414 with D- or better
Recommended: WR II requirement

NUR 421. AGING AND END OF LIFE ISSUES IN NURSING. (3 Credits)
Overview of the impact of the aging population on health care. Common ethical dilemmas encountered in health care will be explored. Application of ethical principles to the complicated situations encountered by inter-professional teams, with special consideration of those related to end-of-life care for the professional nurse.

NUR 422. HEALTH PROMOTION IN NURSING PRACTICE. (3 Credits)
Builds on prior learning and focuses on preventative health care and health promotion for individuals, families, and communities. Consideration is given to the influence of culture and lifespan development. Using biophysical, environmental, spiritual, sociocultural and economic determinants of health, the focus is on the role of nurses in improving health outcomes with individuals, families, and communities.
Prerequisites: NUR 413 with C- or better

NUR 423. NURSING LEADERSHIP. (4 Credits)
Explores the role of the nurse leader, integrating prior learning with an understanding of the nature of leadership as well as leadership and management theories. An introduction to the principles of project management with application to a clinical leadership project is included. Consideration of individual student growth, particularly related to the student outcomes of the program and personal goals for future growth will be a focus. Application of the content will occur in the 54-hour independent clinical practicum, under the direction of the faculty, to develop and implement a clinical leadership project.

Nutrition (NUTR)

NUTR 104. ORIENTATION TO THE NUTRITION MAJOR. (1 Credit)
Discuss and explore the academic and professional requirements for successful entry into professional careers in dietetics, foodservice systems management, and human nutrition sciences majors. Identify professional resources, career opportunities, markets and trends in these OSU Nutrition major options. Graded P/N.
Equivalent to: NFM 104

NUTR 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
Equivalent to: NFM 199

NUTR 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

NUTR 216. *FOOD IN NON-WESTERN CULTURE. (3 Credits)
Cultural determinants influencing food habits of humans. Interrelation of eating patterns and socio-cultural, ecological, psychological and economic factors in cross-cultural settings. Roles of men and women in food provision. Lec/rec. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: NFM 216

NUTR 225. GENERAL HUMAN NUTRITION. (3 Credits)
The relationship of food, its nutrients and other components to the promotion of health and fitness with emphasis on the young adult. Current health concerns on a national and international level. This course is for non-majors; NES majors and those in the health sciences should take NUTR 240.
Equivalent to: NFM 225

NUTR 235. SCIENCE OF FOODS. (5 Credits)
Composition, functional properties, and structure of foods, including modified ingredients. Principles underlying preparation of food products of standard quality. Lec/lab.
Prerequisites: CH 123 with C- or better or CH 223 with C- or better or ((CH 263 with C- or better or CH 263H with C- or better or CH 273 with C- or better) and (CH 233 [C-] or CH 233H [C-]))
Equivalent to: NFM 235
NUTR 240. HUMAN NUTRITION. (3 Credits)
An introductory nutrition course for exercise science, nutrition, dietetics, food science, and health science majors who have taken general chemistry. Concepts of nutrient metabolism and utilization, nutrient deficiencies and toxicities and their relationship to disease prevention and treatment.
Prerequisites: (CH 121 with C- or better or CH 224H with C- or better or (CH 221 with C- or better or CH 231 with C- or better or CH 231H with C- or better))
Equivalent to: NFM 240

NUTR 241. APPLICATIONS IN HUMAN NUTRITION. (1 Credit)
Application of nutrition theory from NUTR 240 using a dietary project and hands-on recitation activities. A key focus of the course will be on applying nutrition theory. Rec.
Prerequisites: NUTR 240 (may be taken concurrently) with C- or better
Equivalent to: NFM 241

NUTR 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: NFM 299
This course is repeatable for 16 credits.

NUTR 306. PROJECTS. (1-16 Credits)
This course is repeatable for 36 credits.

NUTR 307. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

NUTR 311. FOODSERVICE PRODUCTION AND PURCHASING. (4 Credits)
Food production, purchasing, facility and materials management in foodservice operations. Quantity production styles, safety and sanitation, service methods and equipment. Lec/lab/rec.
Prerequisites: NUTR 235 with C- or better
Equivalent to: NFM 311

NUTR 312. ISSUES IN NUTRITION AND HEALTH. (3 Credits)
Impact of nutrition as one component of complex environmental, behavioral, social, and genetic factors significant to health promotion. Apply scientific knowledge to current health issues of changing dietary patterns, technological development in food products and nutrition controversies. Recognize economic and public policy implications. Lec/rec. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: NUTR 225 with C- or better or NUTR 240 with C- or better
Equivalent to: NFM 312
Recommended: Completion of science requirement in Bacc Core

NUTR 319. PROMOTING FOOD AND NUTRITION. (3 Credits)
Strategies in promoting products, services or ideas; negotiating, advertising, public policy, consumer service, social marketing, market research, trends and strategies. Lec.
Prerequisites: NUTR 240 with C- or better and NUTR 241 [C-]
Equivalent to: NUTR 219

NUTR 325. NUTRITION THROUGH THE LIFE CYCLE. (3 Credits)
Nutritional needs and concerns in pregnancy and lactation, infancy, childhood, adolescence, adult and later years.
Prerequisites: (NUTR 240 with C- or better or NUTR 225 with C- or better) and NUTR 241 [C-]
Equivalent to: NFM 325
Recommended: Junior standing

NUTR 341. NUTRITION FOR EXERCISE. (3 Credits)
Review of the interrelationship between nutrition and exercise, including macronutrient, micronutrient and fluid needs for active individuals. CROSSLISTED as KIN 341/NUTR 341.
Prerequisites: KIN 324 with C- or better and NUTR 240 [C-]
Equivalent to: EXSS 341, KIN 341

NUTR 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: NFM 399
This course is repeatable for 16 credits.

NUTR 401. RESEARCH. (1-16 Credits)
Equivalent to: NFM 401
This course is repeatable for 16 credits.

NUTR 403. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 403
This course is repeatable for 16 credits.

NUTR 405. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 405
This course is repeatable for 16 credits.

NUTR 406. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
Equivalent to: NFM 406
This course is repeatable for 16 credits.

NUTR 407. SEMINAR. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 407
This course is repeatable for 16 credits.

NUTR 408. WORKSHOP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 408
This course is repeatable for 16 credits.

NUTR 409. PRACTICUM. (1-16 Credits)
Equivalent to: NFM 409
This course is repeatable for 16 credits.

NUTR 410. FIELD EXPERIENCE. (1-15 Credits)
Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. For advanced students. Applications made and approved term preceding enrollment. Graded P/N.
Equivalent to: NFM 410
This course is repeatable for 50 credits.

NUTR 416. CULTURAL ASPECTS OF FOODS. (3 Credits)
Regional, ethnic, and religious influences on food patterns; worldwide trends in food practices. Laboratory experience with foods from several cultures. Lec/lab. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUTR 235 with C- or better
Equivalent to: NFM 416

NUTR 417. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: BB 350 with C- or better
Equivalent to: NFM 417
Recommended: One physiology course
NUTR 418. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: NUTR 417 with C- or better
Equivalent to: NFM 418
Recommended: Biochemistry and physiology

NUTR 423. COMMUNITY NUTRITION. (4 Credits)
Meeting nutritional needs in community settings; nutritional status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist.
Prerequisites: NUTR 325 with C- or better
Equivalent to: NFM 423

NUTR 430. MEDICAL NUTRITION THERAPY I. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions. Lec/lab/rec.
Prerequisites: (BB 350 with C- or better or (BB 450 with C- or better and BB 451 [C-]) and (BI 233 [C-] or BI 332 [C-]) and (BI 242 [C-] or BI 342 [C-]) and (BI 233 [C-] or BI 333 [C-]) and (BI 243 [C-] or BI 343 [C-]) and NUTR 417 (may be taken concurrently) [C-] and NUTR 439 [C-]

NUTR 431. MEDICAL NUTRITION THERAPY II. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Prerequisites: NUTR 430 with C- or better

NUTR 432. MEDICAL NUTRITION THERAPY III. (3 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Prerequisites: NUTR 431 with C- or better

NUTR 439. *COMMUNICATIONS IN DIETETICS. (3 Credits)
Theory and practice in food and nutrition communications in dietetics. Experience in nutritional counseling and interviewing, employee training and nutritional education materials development, public speaking, and media presentation strategies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: NUTR 325 with C- or better
Equivalent to: NFM 439

NUTR 446. MANAGING FOOD AND NUTRITION SERVICES. (4 Credits)
Overview of organizational structure, functions of managers in food and nutrition service organizations: human and financial resources, regulatory influences, health care organizations, current issues in operations. Lec/rec.
Prerequisites: NUTR 311 with C- or better
Equivalent to: NFM 446

NUTR 447. MANAGEMENT OF FOOD SYSTEMS LABORATORY. (3 Credits)
Application of theory in managing a university food service as part of a student team: planning, production, projecting resource needs, evaluation of outcomes and financial goals.
Equivalent to: NFM 447
Recommended: NUTR 446 or NUTR 546

NUTR 499. SPECIAL TOPICS IN DIETETICS. (1-16 Credits)
Current issues, trends, and topics in nutrition and dietetics. May be repeated for credit when topic varies.
Equivalent to: NFM 499
This course is repeatable for 16 credits.

NUTR 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 501
This course is repeatable for 16 credits.

NUTR 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 502
This course is repeatable for 16 credits.

NUTR 503. THESIS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 503
This course is repeatable for 999 credits.

NUTR 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 505
This course is repeatable for 16 credits.

NUTR 506. SPECIAL PROBLEMS; PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 506
This course is repeatable for 16 credits.

NUTR 507. SEMINAR. (1-16 Credits)
1 credit graded P/N.
Equivalent to: NFM 507
This course is repeatable for 16 credits.

NUTR 508. WORKSHOP. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 508
This course is repeatable for 16 credits.

NUTR 509. PRACTICUM. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 509
This course is repeatable for 16 credits.

NUTR 510. FIELD EXPERIENCE: INTERNSHIP. (1-16 Credits)
Supervised work experience with professional-level responsibilities in community agency or business firm. Supplementary conferences, readings, reports. Supervised by agency/firm and instructor. Limited to students admitted to degree program. Application made and approved in the term preceding enrollment. No more than 6 credits may be applied to a master's degree program.
Equivalent to: NFM 510
This course is repeatable for 16 credits.

NUTR 514. HEALTH BENEFITS OF FUNCT FOODS, NUTRACEUT, DIETARY SUPPLEMEN. (3 Credits)
Functional foods, nutraceuticals and dietary supplements represent a rapidly expanding segment of domestic and international markets. This course will overview the principles and procedures necessary to evaluate and market these products. The chemistry and mechanisms of major nutraceutical ingredient categories and current scientific information supporting their biochemical and physiological efficacy will be addressed. Special dietary products, such as medical, weight control, sport, and herbal supplements, will be addressed. Regulatory aspects of labeling and structure-function claims will be covered. CROSSLISTED as FST 514/NUTR 514.
Equivalent to: FST 514, NFM 514
Recommended: BB 350 and CH 332
NUTR 516. CULTURAL ASPECTS OF FOODS. (3 Credits)
Regional, ethnic, and religious influences on food patterns; worldwide trends in food practices. Laboratory experience with foods from several cultures. Lec/lab.
Equivalent to: NFM 516
Recommended: NUTR 235

NUTR 517. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Equivalent to: NFM 517
Recommended: BB 350 and one physiology course

NUTR 518. HUMAN NUTRITION SCIENCE. (4 Credits)
Application of biochemistry and physiology to nutrition of the individual.
Prerequisites: NUTR 517 with C or better
Equivalent to: NFM 518
Recommended: biochemistry, physiology.

NUTR 523. COMMUNITY NUTRITION. (4 Credits)
Meeting nutritional needs in community settings; nutritional status of individuals and groups; programs of public and private agencies and industry; intervention techniques. Roles of community nutritionist.
Equivalent to: NFM 523
Recommended: NUTR 325

NUTR 525. ORGANIC FOOD AND HEALTH: EVIDENCE AND CONSUMER PERCEPTIONS. (3 Credits)
Overview of organic food including an understanding of the definition, certifications and labeling; basic production comparisons with conventional foods, evidence for comparisons between organic and conventionally produced foods; consumer attitudes and perceptions regarding organic foods.

NUTR 530. MEDICAL NUTRITION THERAPY 1. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions. Lec/lab/rec.
Recommended: (BB350 or (BB450 and BB 451)) and (BI 232 or BI 332) and (BI 242 or BI 342) and (BI 233 or BI 333) and (BI 243 or BI 343) and NUTR 439 and completion or concurrent enrollment in NUTR 417

NUTR 531. MEDICAL NUTRITION THERAPY 2. (4 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions are addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Recommended: NUTR 430

NUTR 532. MEDICAL NUTRITION THERAPY 3. (3 Credits)
Principles and practices related to implementation and documentation of the nutrition care process in dietetics. Diet-related conditions addressed during the three-course sequence using lecture, case studies and assessment recitation sessions.
Recommended: NUTR 431

NUTR 535. NUTRITION AND EXERCISE: MACRONUTRIENTS AND ENERGY METABOLISM. (3 Credits)
Current research examining the interrelationship of macronutrients and exercise and energy balance will be reviewed, including their roles in health, disease prevention and exercise performance.
Equivalent to: NFM 535
Recommended: NUTR 517 or KIN 533

NUTR 539. COMMUNICATIONS IN DIETETICS. (3 Credits)
Theory and practice of food and nutrition communications in dietetics. Experience in nutritional counseling and interviewing, employee training and nutritional education materials development, public speaking, and media presentation strategies.
Equivalent to: NFM 539
Recommended: NUTR 325

NUTR 546. FOODSERVICE ORGANIZATIONS. (3 Credits)
Overview of organizational structure, functions of managers in foodservice organizations: human resources, regulatory influences, health care organizations, current issues in operations. Lec/rec.
Equivalent to: NFM 546
Recommended: NUTR 311 and NUTR 445

NUTR 550. NUTRITIONAL STATUS. (4 Credits)
Research studies with emphasis on estimation of nutrient intake and assessment of nutritional status, including biochemical, clinical, epidemiological and anthropometric measures. Interpretation of status indicators.
Equivalent to: NFM 550
Recommended: NUTR 418 or NUTR 518

NUTR 551. ADVANCED MEDICAL NUTRITION THERAPY. (4 Credits)
This advanced course includes evidence-based practices and standards of care available to address complex scenarios for which medical nutrition therapy is an integral part of patient care. Students will build on prior assessment, nutritional diagnostic, implementation, monitoring, evaluation and documentation skills relevant to dietetics practice. Lecture, readings, case studies including professional documentation and expert guest will be used to illustrate medical nutrition therapy addressing topics such as as domestic malnutrition, nutrition support, pediatric nutrition, eating disorders, diabetes and geriatric nutrition.

NUTR 552. FOOD AND NUTRITION PROGRAM MANAGEMENT AND EVALUATION. (4 Credits)
Introduction to the evaluation of outcomes and impacts of food/nutrition-related systems, performance, interventions, programs and/or policies. Application of methods used to appraise problems or activities, as well as to conceptualize, create, implement and administer evaluations in order to make decisions regarding their outcomes, impacts, efficiency and cost effectiveness. A case study approach across a range of food and nutrition-related public, government and private organizations will introduce the breadth of approaches in such evaluations.

NUTR 553. DIETARY BEHAVIOR AND COUNSELING. (4 Credits)
Strategies for navigating dietary behavior using collaborative, patient centered, goal-oriented approaches. Introduces the theoretical framework around dietary behavior and motivational interviewing with methods regarding the language of change and creating client/patient interest in change. Guided practice and focus on development of skills.

NUTR 599. SPECIAL TOPICS IN NUTRITION. (1-16 Credits)
Current issues, trends, and topics in nutrition and health. May be repeated for credit when topic varies.
Equivalent to: NFM 599
This course is repeatable for 16 credits.

NUTR 601. RESEARCH. (1-16 Credits)
Equivalent to: NFM 601
This course is repeatable for 16 credits.

NUTR 602. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
Equivalent to: NFM 602
This course is repeatable for 16 credits.
Ocean Earth & Atmospheric Sci (OEAS)

OEAS 500. CASCADIA FIELD TRIP. (2-4 Credits)
A field course to various locations within the Cascade volcanic arc, Coast Range and Oregon Coast. Introduction to the range of physical and biological science topics to be covered in OEAS 520, OEAS 530 and OEAS 540 in field settings; the linkages between these topics, and their impact on humans, with case examples. Students will practice math skills, and collect samples and data to be used in laboratory sessions in the later courses. Offered annually. Transportation fee charged. Graded P/N.
This course is repeatable for 4 credits.

OEAS 511X. PROFESSIONAL INSTRUCTION IN CEOAS. (1 Credit)
Provides graduate teaching assistants and potential teaching assistants in the College of Earth, Ocean, and Atmospheric Sciences with an introduction to effective instruction techniques, including the expectations of instructors, teaching pedagogy, use of technology, ethical instruction, inclusivity in the classroom and other topics.

OEAS 520. THE SOLID EARTH. (4 Credits)
Movement of mass and energy within the Earth and into/out of its outer surface, expressed as plate tectonics, earthquakes, heat flow, volcanoes, geomagnetic field; composition, structure, hydrology and aging of ocean crust; lithosphere creation, recycling and mantle overturn. Marine sedimentation, sources and transport, continental weathering, tectonics-climate interactions, glacial history and sea level response. Geohazards, storm events, beach and estuarine processes. Offered annually. Lec/lab.
Recommended: One year each of physics, chemistry and calculus

OEAS 530. THE FLUID EARTH. (4 Credits)
Fundamental principles of fluid circulation in the atmosphere and ocean. Atmospheric chemistry, radiation, thermodynamics, and dynamics. Conservation of mass, heat, momentum and vorticity in the ocean; equations governing motion; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation. Air-sea fluxes and global circulation models; climate change. Offered annually. Lec/lab.
Recommended: One year each of physics, chemistry, calculus, or science and a field course

OEAS 540. THE BIOGEOCHEMICAL EARTH. (4 Credits)
Integrating fundamental concepts in biological and chemical oceanography to understand energy and material transformations in estuarine, coastal and open ocean habitats. Topics include structure and function of marine ecosystems, biogeochemical cycles, and human impacts. Offered annually. Lec/lab.
Recommended: One year of physics, chemistry, and calculus

Oceanography (OC)

OC 003. UNDERGRADUATE RESEARCH. (0 Credits)
Engage in research activities appropriate to the discipline; and through the research experience, acquire skills, techniques, and knowledge relevant to the field of study. In consultation with a faculty mentor, engage in research activity, and make and execute a plan for a project.

OC 004. INTERNSHIP. (0 Credits)
Provides basic personal and professional skills that can be used within and outside of a work setting. Through practice, this experience guides students in building and maintaining positive professional relationships, networking/mentoring relationships, and enhances students’ understanding of the connection between theory and practice in their respective disciplines.

OC 103. *EXPLORING THE DEEP GEOPHYSIOGRAPHY OF THE WORLD’S OCEANS. (4 Credits)
Introduces non-science students to the oceans, including marine geology and chemistry, ocean currents, coastal and biological processes. Field trip required, transportation fee charged. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: GEO 103H, OC 103H

OC 199. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
Introduction to topics of current interest in oceanography for lower-division undergraduates. May be repeated for credit when topic varies.
This course is repeatable for 16 credits.
OC 201. *OCEANOGRAPHY. (4 Credits)
Plate tectonics and the geological structure of ocean basins; physical and chemical properties of seawater; Earth's energy budget; large-scale circulation of the atmosphere and ocean; marine sediment properties and transport; Earth history recorded in marine sediments; the carbon cycle in the atmosphere and sea; and the ecology of pelagic and benthic systems. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: OC 331H

OC 202X. INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY. (4 Credits)
Explore critical topics to biological oceanography, including: the interaction of ocean life, past and present, with its chemical, physical, and geological environment; how ocean life captures energy to produce food and affect climate; and how historical sea-faring observations shaped our understanding of ocean life relative to current technological advances. Field trips required.

OC 295. INTRODUCTION TO FIELD OCEANOGRAPHY - LAND. (1 Credit)
OC 295 is preparatory for the intensive OC 296 field portion at sea. Students will learn about the collection of samples and data using methods and instruments that are common in sea-going oceanography and help plan the cruise.
Prerequisites: OC 201 (may be taken concurrently) with D- or better

OC 296. INTRODUCTION TO FIELD OCEANOGRAPHY - SEA. (2 Credits)
The sea-going field portion of OC 295 onboard a large research vessel. During the multi-day cruise students will collect oceanographic data and samples from the coastal ocean. Students who complete OC 295 and OC 296 will learn how to collect data and samples on the high seas, conduct preliminary analyses of data, and contribute to the development of scientific knowledge. Serves as an introduction to upper-division course work in oceanography.
Prerequisites: OC 295 with P or better

OC 332. COASTAL OCEANOGRAPHY. (3 Credits)
Physics, geology, biology and hydrology of coastal oceans. How coastal waters respond to forcing by heating, cooling, winds, tides, waves, rain, evaporation, river runoff and freezing. Geography and geology of coastlines: erosion and deposition processes, beach dynamics. Coastal equilibrium cells as sources and sinks of sediment. Rocky shore, beach, mudflat, estuarine, and coastal biotic communities; animal migrations. Law of the Sea rights and responsibilities of coastal states. Fisheries and mariculture in coastal seas. Pollution and coastal ocean resources. Using a matrix to define environmental problems; pathways that pollutants take through the coastal ecosystem. Offered annually.
Equivalent to: OC 332H

OC 333. OCEANS, COASTS, AND PEOPLE. (3 Credits)
Contemporary issues related to human interactions with the oceans and coastal zones, including living and energy resources, geohazards and impacts of global change. Content presented in lectures, readings and group discussions, with project oral presentations.
Recommended: OC 201

OC 334. *POLAR OCEANOGRAPHY. (3 Credits)
Explores the physical, chemical and biological oceanography of the Arctic and Antarctic and examines the impacts of man's activities both directly through resource utilization, and indirectly through climate change. Introduction to polar oceanography through a series of lectures, interactive classes, written assignments and a case study. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: OC 201 with D- or better

OC 399. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
Equivalent to: OC 399H
This course is repeatable for 16 credits.

OC 399H. SPECIAL TOPICS IN OCEANOGRAPHY. (1-4 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: OC 399
This course is repeatable for 16 credits.

OC 401. RESEARCH PROJECTS. (1-16 Credits)
Field and laboratory research in oceanography for undergraduates, resulting in a written report. This course is repeatable for 24 credits.

OC 403. THESIS. (1-16 Credits)
Independent, original study that culminates in a senior thesis. Faculty sponsor must be prearranged. Graded P/N. This course is repeatable for 24 credits.

OC 405. READING AND CONFERENCE. (1-4 Credits)
Independent library research and reading in specialized topics in oceanography for undergraduates, guided by discussions in conferences with faculty. A written report may be required.
Equivalent to: OC 407H
This course is repeatable for 12 credits.

OC 407. SEMINAR. (1-3 Credits)
Undergraduate seminar on current developments in the oceanographic research literature, with student presentations and group discussions. A written report may be required.
Equivalent to: OC 407
This course is repeatable for 16 credits.

OC 410. INTERNSHIP. (1-16 Credits)
Pre-career professional experience under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 48 credits.
Recommended: 12 credits of upper-division college courses

OC 430. PRINCIPLES OF PHYSICAL OCEANOGRAPHY. (4 Credits)
Fundamental principles of physical oceanography; conservation of mass, heat, momentum and vorticity; equations governing motion in the ocean; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation. Descriptive oceanography; application of the fundamental principles to the ocean; examination of the major current systems; water mass analysis. Offered annually.
Recommended: One year each of college physics and college calculus.

OC 433. COASTAL AND ESTUARINE OCEANOGRAPHY. (3 Credits)
Circulation of the coastal ocean including continental shelf circulation, upwelling, coastal jets, undercurrents, coastal-trapped waves. Fundamentals of surface waves and tides; tsunamis, wind generation, breaking waves. Estuary classification and circulation patterns; shallow-water processes and beach morphology. Offered alternate years.
Recommended: One year of college physics and one year of calculus.
OC 434. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. CROSSTLISTED as FW 434/OC 434 and FW 534/OC 534.
Equivalent to: FW 434

OC 440. BIOLOGICAL OCEANOGRAPHY. (4 Credits)
An advanced examination of the ocean as an ecosystem with emphasis on the processes affecting the production and structure of oceanic communities. Starting with the physical and chemical characteristics of the ocean environment, lectures and labs examine the flow of energy and matter from primary producers through primary consumers up to higher trophic levels. Microbial and benthic processes are examined. Current topics, such as hypoxia, ocean acidification and harmful algal blooms are discussed. Lec/lab.
Prerequisites: OC 201 with C- or better
Recommended: Two terms of college-level biology

OC 449. ECOLOGICAL THEORIES IN BIOLOGICAL AND FISHERIES OCEANOGRAPHY DATA. (4 Credits)
Students will learn the ecological theories applied in fisheries oceanography research and analytical techniques used to quantify fisheries oceanography processes. The lecture and lab sessions will be presented in the context of fundamental ecological research, including effects of environmental and climate variability on production and distribution of species and communities. A specific emphasis is toward analyses of large spatio-temporal data. Lec/Lab.
Prerequisites: (MTH 252 with C or better or MTH 252H with C or better or MTH 228 with C or better) and (ST 351 [C] or ST 351H [C]) and (OC 440 (may be taken concurrently) [C] or BI 370 [C] or BI 370H [C])

OC 450. CHEMICAL OCEANOGRAPHY. (4 Credits)
Chemical properties and processes in the oceans. Composition, origin and evolution of sea water; thermodynamic and kinetic predictions for reactions in sea water; major and minor element reservoirs and fluxes; vertical and horizontal transport of materials; isotopic clocks and tracers; nutrients; chemical processes and fluxes across major marine interfaces, including estuaries, atmosphere, sediments, suspended particles and hydrothermal systems. Lec/Lab.
Prerequisites: CH 122 with D- or better or CH 232 with D- or better or CH 232H with D- or better
Recommended: one year of college-level general chemistry.

OC 460. GEOLOGICAL OCEANOGRAPHY. (3 Credits)
Structure of ocean basins, plate tectonics and sea floor spreading, marine sedimentation, history of ocean basins, and analysis of geological and geophysical data. Offered annually.
Recommended: One year each of physics and chemistry or science background.

OC 495X. ADVANCED FIELD OCEANOGRAPHY 1. (2 Credits)
Design a ship-based research project and contribute to the preparation and planning for a related oceanographic cruise.
Prerequisites: (OC 430 with C- or better or OC 440 with C- or better or OC 450 with C- or better or OC 460 with C- or better) and (OC 430 [C-] or OC 440 [C] or OC 450 [C-] or OC 460 [C])
Recommended: Senior standing

OC 496X. ADVANCED FIELD OCEANOGRAPHY 2. (4 Credits)
Participate in an oceanographic cruise to collect data and samples. Analyze data and samples and prepare a written report of findings.
Prerequisites: OC 495X with C- or better
Recommended: Senior standing

OC 499. SPECIAL TOPICS IN OCEANOGRAPHY. (0-4 Credits)
Subjects of current interest in oceanography, not covered in depth in other courses. May be repeated for credit when topic varies.
Equivalent to: OC 499H
This course is repeatable for 16 credits.

OC 501. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N.
This course is repeatable for 24 credits.

OC 503. THESIS. (1-16 Credits)
Thesis research and writing.
This course is repeatable for 999 credits.

OC 505. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in oceanography, guided by discussions with supervising faculty. A written report may be required.
This course is repeatable for 16 credits.

OC 506. PROJECTS. (1-16 Credits)
This course is repeatable for 72 credits.

OC 507. SEMINAR. (1-3 Credits)
Student presentations and discussions of current research literature or personal research results. Original research presentations by visiting scientists, OSU faculty and graduate students presenting final thesis results. Other sections and specific topics by arrangement.
This course is repeatable for 48 credits.

OC 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

OC 512. BASIC MATLAB FOR ENVIRONMENTAL SCIENTISTS AND ENGINEERS. (2 Credits)
MATLAB desktop environment will be introduced and basic programming and data analysis skills will be developed, with an emphasis on writing optimized routines to analyze data sets utilizing matrix algebra and vectorization of functions. Basic graphics and visualization will be covered, including two-dimensional and three-dimensional graphing, contouring and movies.

OC 515. OREGON COAST MATH CAMP. (3 Credits)
Selected topics from differential calculus, integral calculus, ordinary and partial differential equations, statistics, linear algebra and vector calculus. Two-week course taught at Hatfield Marine Science Center in Newport, Oregon, before fall term begins. Graded P/N.
Recommended: Differential and integral calculus and linear algebra

OC 521. APPLICATIONS IN OCEAN ECOLOGY AND BIOGEOCHEMISTRY. (4 Credits)
Methodological underpinnings of marine ecology and biogeochemistry. Students will learn about both new and traditional methods of seawater analysis and biological rate determinations. They will evaluate methods by analyzing observations and samples, and assessing the interpretive effectiveness of approaches. Lec/lab.
Prerequisites: OEAS 540 with C or better
Corequisites: OC 522, OC 523
Equivalent to: G 521
OC 522. OCEAN BIOGEOCHEMICAL DYNAMICS. (4 Credits)
Examines what keeps ocean systems in balance, and determines their response to perturbation. The course relies on connections between physical transport and biogeochemical reaction rates and energetics, taught from the perspective of key ocean biogeochemical cycles.
Corequisites: OC 521, OC 523

OC 523. OCEAN ECOLOGICAL DYNAMICS. (4 Credits)
Major characteristics of ocean biota and ocean ecosystems. Main themes will be centered on the bioenergetics of marine systems at levels ranging from the individual to ocean biomes, and on how ocean biota facilitates diverse marine biogeochemical processes. Lec/rec.

OC 528. MICROPROBE ANALYSIS. (3 Credits)
Theory and application of electron microprobe analysis to problems in geology, engineering, chemistry, physics, and biology.
Equivalent to: GEO 528

OC 533. COASTAL AND ESTUARINE OCEANOGRAPHY. (3 Credits)
Circulation of the coastal ocean including continental shelf circulation, upwelling, coastal jets, undercurrents, coastal-trapped waves. Fundamentals of surface waves and tides; tsunamis, wind generation, breaking waves; shallow-water processes and beach morphology. Offered alternate years.
Recommended: One year of college physics and one year of calculus.

OC 534. ESTUARINE ECOLOGY. (4 Credits)
Integrated and synthetic training in the ecological processes of estuarine environments, with emphases on ecological interactions among organisms and the biogeochemical cycling of carbon and nitrogen. Topics include geomorphology, estuarine physics and chemistry, primary and secondary producers, ecosystem metabolism, element cycling, food webs, fisheries, restoration, management, and impacts of climate. Field trip required, transportation fee charged. Crosslisted as FW 434/OC 434 and FW 534/OC 534.
Equivalent to: FW 534

OC 549. ECOLOGICAL THEORIES IN BIOLOGICAL AND FISHERIES OCEANOGRAPHY DATA. (4 Credits)
Students will learn the ecological theories applied in fisheries oceanography research and analytical techniques used to quantify fisheries oceanography processes. The lecture and lab sessions will be presented in the context of fundamental ecological research, including effects of environmental and climate variability on production and distribution of species and communities. A specific emphasis is toward analyses of large spatio-temporal data. Lec/Lab.
Recommended: (MTH 252 or MTH 252H or MTH 228) and (ST 351 or ST 351H) and (OC 440 or BI 370 or BI 370H)

OC 561. IGNEOUS AND TECTONIC PROCESSES IN THE OCEAN. (3 Credits)
An integrated view of the igneous and tectonic processes responsible for the formation and evolution of the ocean basins. The course is organized by tectonic environment including ridge crest, ridge flank, ocean basins, seamounts, and active and passive margins.
Recommended: One year each physics, calculus and geology.

OC 562. SEDIMENTARY PROCESSES IN THE OCEAN BASINS. (3 Credits)
An integrated view of sediment processes in the ocean basins from a source to sink perspective, with a special emphasis on the interpretation of the historical record.
Recommended: OC 550 and one year each physics and calculus and geology.

OC 574. EARLY LIFE HISTORY OF FISHERIES. (4 Credits)
Overview of diversity of development patterns in fishes; emphasis on morphology, life history, and evolution. Offered alternate years. Crosslisted as FW 574/OC 574.
Equivalent to: FW 574
Recommended: FW 315

OC 599. SPECIAL TOPICS IN OCEANOGRAPHY. (0-4 Credits)
Subjects of current interest in oceanography, not covered in depth in other courses. May be repeated for credit when topic varies. This course is repeatable for 12 credits.

OC 601. RESEARCH. (1-16 Credits)
Original research work that will not be part of the data used in a thesis. Graded P/N.
This course is repeatable for 36 credits.

OC 603. THESIS. (1-16 Credits)
Theory research and writing.
This course is repeatable for 99 credits.

OC 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading and library research on specialized topics in oceanography, guided by discussions with supervising faculty. A written report may be required.
This course is repeatable for 16 credits.

OC 606. PROJECTS. (1-16 Credits)
This course is repeatable for 84 credits.

OC 607. SEMINAR. (1-3 Credits)
Student presentations and discussion of current research literature or personal research results. Original research presentations by visiting scientists, OSU faculty and graduate students presenting final thesis results. Other sections and specific topics by arrangement.
This course is repeatable for 48 credits.

OC 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 24 credits.

OC 630. OCEAN WAVE MECHANICS I. (3 Credits)
Linear wave boundary value problem formulation and solution, water particle kinematics, shoaling, refraction, diffraction, and reflection. Linear long wave theory with applications to tides, seiching, and storm surge. Crosslisted as CE 630/OC 630.
Equivalent to: CE 630

OC 631. OCEAN WAVE MECHANICS II. (3 Credits)
Second in the sequence of ocean wave engineering mechanics, covers the following topics: introduction to long wave theory, wave superposition, wave height distribution, and the wind-wave spectrum, introduction to wave forces, and basic nonlinear properties of water waves. May include additional selected topic in wave mechanics. Crosslisted as CE 631/OC 631.
Prerequisites: CE 630 with C or better or OC 630 with C or better
Equivalent to: CE 631

OC 634. LONG WAVE MECHANICS. (3 Credits)
Theory of long waves. Depth-integrated Euler’s equation and its jump conditions. Evolution equations and their solutions. Nonlinear shallow-water waves, the Korteweg-deVries equation and Boussinesq equation. Boundary-layer effects. Shallow-water waves on beaches. Applications of the fundamentals to problems of tsunamis. Crosslisted as CE 634/OC 634.
Prerequisites: OC 630 with C or better and CE 631 [C]
Equivalent to: CE 634
Recommended: OC 670
OC 635. APPLIED MODELING OF NEARSHORE PROCESSES. (4 Credits)
An introduction to numerical modeling of the nearshore ocean, providing hands-on experience with state-of-the-art numerical models for wave propagation, nearshore circulation, planform shoreline evolution and bathymetric profile evolution. The focus is on review of model requirements, detailed study of several specific models for several domains of interest, application to coastal phenomena, and the interpretation of model results. Offered alternate years. CROSSLISTED as CE 635/OC 635.
Equivalent to: CE 635

OC 646. PHYSICAL/BIOLOGICAL INTERACTIONS IN THE UPPER OCEAN. (4 Credits)
Variability in physical oceanic processes in the upper ocean and relationship to spatial and temporal variations in biomass, growth rates, and other biological patterns in the organisms of ocean surface waters. The relationship between variability in ocean physical phenomena and ecosystem dynamics, including the requirements of sampling design for upper ocean ecological studies. Time and space scales of physical and biological phenomena in the upper ocean. Offered alternate years. Offered alternate years, typically fall term.
Prerequisites: OEAS 530 with C or better and OEAS 540 [C]

OC 649. SPECIAL TOPICS IN BIOLOGICAL OCEANOGRAPHY. (1-4 Credits)
Special topics of current interest in biological oceanography not covered in detail in other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 657. SEDIMENT BIOGEOCHEMISTRY. (3 Credits)
An overview of early diagenetic processes in marine sediments and the interdisciplinary approaches used to quantify material transformations at the seafloor. Recommended: OC 550

OC 659. SPECIAL TOPICS IN CHEMICAL OCEANOGRAPHY. (1-4 Credits)
Special topics of current interest in chemical oceanography not covered in detail by other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 660. PALEOCEANOGRAPHY. (3 Credits)
Large-scale changes in the oceanic and atmospheric system, as recorded in marine sediments, and their implications for understanding global environment changes. Chemical, physical, and biological proxies for oceanic and atmospheric processes in the geologic record period. Evidence for changing global climate at time scales longer than the historical record; the oceanic history of the Late-Cenozoic ice ages, long term evolution of climate change patterns, catastrophic global environmental events, and application of quantitative models to the past. Current research topics in paleoceanography. Offered alternate years. Recommended: OC 560

OC 662. NEARSHORE HYDRODYNAMICS. (3 Credits)
Briefly reviews wave processes in the nearshore, and concentrates on the wave-averaged circulation with an eye towards it potential effects on bathymetric change. Recommended: Previous courses related to water wave mechanics and differential equations

OC 664. NEARSHORE SEDIMENT TRANSPORT. (3 Credits)
To study the dynamics of a nearshore wave field propagating over a shoaling bathymetry, the response of sediments and morphology to those motions, emergent morphology due to the coupled system, anthropogenic influences and mitigation. Recommended: General physics, integral and differential calculus; nearshore hydrodynamics.

OC 668. THEORETICAL PETROLOGY. (3 Credits)

OC 669. SPECIAL TOPICS IN GEOLOGICAL OCEANOGRAPHY. (1-4 Credits)
Subjects of current interest in geological oceanography not covered in depth in other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 670. FLUID DYNAMICS. (4 Credits)
Fundamentals of fluid dynamics: conservation laws of mass, momentum, and energy; inviscid and viscous flows; boundary layers; vorticity dynamics; irrotational and potential flow. Offered annually. Recommended: One year of college physics; mathematics through differential equations and vector calculus.

OC 671. GEOPHYSICAL FLUID DYNAMICS. (4 Credits)
Dynamics of rotating and stratified fluids, potential vorticity, geostrophic motion; inviscid shallow-water theory, Poincare, Kelvin, and Rossby waves; geostrophic adjustment, quasigeostrophic approximation, Ekman layers, two-layer and continuously stratified models. Offered annually. Prerequisites: OC 670 with C or better

OC 672. THEORY OF OCEAN CIRCULATION. (4 Credits)
Theory of steady and time-dependent large-scale circulation in ocean basins. Effects of earth's curvature: the beta-plane approximation. The wind-driven Sverdrup circulation, western boundary currents, eastern boundary upwelling; the effects of friction. Linear theory and nonlinear theory; inertial gyres. Effects of buoyancy forcing; heating, cooling, evaporation, precipitation; density stratification. Wind- and buoyancy-forced circulation in the thermocline; ventilation. Potential vorticity conservation and homogenization. Offered annually. Prerequisites: OC 670 with C or better and OC 671 [C]

OC 673. DESCRIPTIVE PHYSICAL OCEANOGRAPHY. (4 Credits)
Fundamental mass, force, and energy balances of the ocean; geostrophy; planetary boundary layers; wind-driven and thermohaline circulation; vorticity; air-sea fluxes of heat, salt, moisture and momentum. Application of these balances through descriptive examination of the ocean-global heat budget; surface current systems; abyssal circulation. Study of variability on a variety of time and space scales. Instrumentation and platforms used for observing the ocean. Offered annually. Prerequisites: OC 530 with C or better or OC 670 with C or better or ATS 515 with C or better

OC 674. TURBULENCE. (4 Credits)
Governing equations, turbulent kinetic energy, vorticity dynamics; turbulent transports of mass and momentum; statistical description of turbulent flows, spectral dynamics; turbulent boundary layers, planetary boundary layers in the atmosphere and ocean, convective mixed layers, stable boundary layers; deep ocean turbulence. Offered alternate years. Prerequisites: OC 670 with C or better
OC 675. NUMERICAL MODELING IN OCEAN CIRCULATION. (4 Credits)
Review of theoretical models of ocean circulation, including shallow water, barotropic, quasigeostrophic, and primitive equation models; adjustment times, internal length and time scales; the role of advection, bathymetry, and coastlines; global models, basin models, regional models and models of jets, eddies and boundary currents. Review of numerical techniques and problems specific to ocean modeling. Local facilities are used to develop models on remote supercomputers.
Prerequisites: OC 670 with C or better
Recommended: Working knowledge of FORTRAN

OC 676. INVERSE MODELING AND DATA ASSIMILATION. (4 Credits)
Survey of methods for combining oceanographic observations and observing systems with numerical models of ocean circulation. Topics include: finite-dimensional least squares theory with inequality constraints; optimal interpolation; the representation theory of smoothing; the Kalman smoother and filter; gradient descent methods for minimization; spatial and temporal regularity of filters and smoothers; linear theory of array design; nonlinear optimization, practical assimilation methods.
Recommended: Strong background in linear algebra and advanced calculus, geophysical fluid dynamics, numerical modeling of ocean circulation.

OC 678. OCEAN REMOTE SENSING. (4 Credits)
Theory and applications of satellite remote sensing observations of the ocean with emphasis on strengths and limitations in the measurements. Topics include review of electricity and magnetism, absorption and scattering in the atmosphere (radiative transfer), satellite orbital mechanics, measurements of ocean color, infrared remote sensing, microwave radiometry, scatterometry, and satellite altimetry. Offered alternate years.
Recommended: MTH 252 and PH 212

OC 679. SPECIAL TOPICS IN PHYSICAL OCEANOGRAPHY. (1-4 Credits)
Subjects of current interest in physical oceanography, not covered in depth in other courses. May be repeated for credit when topic varies. This course is repeatable for 16 credits.

OC 680. STABILITY OF GEOPHYSICAL FLUID FLOWS. (4 Credits)
Linear perturbation analysis applied to geophysical flows. These methods provide both quantitative and conceptual insight into the formative stages of turbulent flow. Emphasis is on practical numerical methods for the solution of differential eigenvalue problems. Examples are drawn from a wide range of geophysical flow instabilities, based in part upon student interests.
Prerequisites: OC 670 with C or better
Recommended: Multivariate calculus, matrix calculus, Matlab and concurrent enrollment in OC 670

OC 681. GEOPHYSICAL WAVES. (4 Credits)
Fundamentals of wave dynamics applied to geophysical fluids. Hyperbolic waves—linear and nonlinear; characteristics; shock waves. Dispersive waves—linear waves, dispersion relations, group velocity; isotropic and anisotropic dispersion; nonlinear solitary waves. Application to geophysical waves—surface gravity, capillary, internal gravity, Kelvin, planetary, coastal. Offered alternate years.
Prerequisites: OC 670 with C or better

OC 682. DATA ANALYSIS IN THE TIME AND SPACE DOMAINS. (4 Credits)
Theory of classical and modern techniques for analysis of data in the time and space domains with applications to real oceanographic and atmospheric data. Topics include correlation analysis, regression analysis, EOF analysis, objective mapping, interpolation, filtering, sampling errors, and confidence tests. Offered alternate years.
Recommended: MTH 341 and MTH 342 and MTH 418 and OC 608 and ST 314 and a working knowledge of Matlab, IDL, or FORTRAN

OC 683. DATA ANALYSIS IN THE FREQUENCY AND WAVE NUMBER DOMAINS. (4 Credits)
Theory of classical and modern techniques for analysis of data in the frequency and wavenumber domains with applications to real oceanographic and atmospheric data. Topics include sampling theory, one-dimensional autospectral analysis, multidimensional autospectral analysis, coherence and phase analysis, bi-spectral analysis, wavelet analysis, and confidence tests. Offered alternate years.
Equivalent to: ATS 683
Recommended: MTH 341 and MTH 342 and MTH 418 and OC 608 and ST 314 and a working knowledge of Matlab, IDL, or FORTRAN

OC 691. PROPOSAL WRITING. (3 Credits)
Teaches the use of NSF Fastlane. Includes a discussion of ethics and fairness in reviewing, a review of real proposals by faculty, a simulated NSF funding panel, and then development of a real proposal, for review purposes. This will relate directly to the student’s current thesis or project. The course enables graduate students from all disciplines to develop rigorous, well thought-out proposals. It should be taken early enough in the program so that the proposal process contributes to their research progress.

OC 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Outdoor Products (OP)

OP 101. INTRODUCTION TO THE OUTDOOR PRODUCTS INDUSTRY. (4 Credits)

OP 231. EXPERIENCE OUTDOOR PRODUCTS - WATER. (2 Credits)
Hands-on experience with multiple water-related outdoor products in classroom and outdoor settings. Identifying key characteristics for consumers and implications for design, development, marketing, business, and sustainability. Evaluating product performance and developing ideas for objective improvements. Includes one mandatory weekend outdoor-experience outing.

OP 232. EXPERIENCE OUTDOOR PRODUCTS - WINTER. (2 Credits)
Hands-on experience with multiple winter-related outdoor products in classroom and outdoor settings. Identifying key characteristics for consumers and implications for design, development, marketing, business, and sustainability. Evaluating product performance and developing ideas for objective improvements. Includes one mandatory weekend outdoor-experience outing.
OP 233. EXPERIENCE OUTDOOR PRODUCTS - LAND. (2 Credits)
Hands-on experience with multiple land-related outdoor products in classroom and outdoor settings. Identifying key characteristics for consumers and implications for design, development, marketing, business, and sustainability. Evaluating product performance and developing ideas for objective improvements. Includes one mandatory weekend outdoor-experience outing.

Peace Studies (PAX)

PAX 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PAX 201. STUDY OF PEACE AND THE CAUSES OF CONFLICT. (3 Credits)
Examination of the causes of personal, social, and institutional conflict and peaceful, constructive means of dealing with conflict. The history and current status of peace movements within and outside governments; prospects for world peace. Case studies in peace and conflict. CROSSLISTED as PAX 201/REL 201. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 201

PAX 301. *PEACE STRATEGIES. (4 Credits)
Investigates the relationship between science, peace and justice on personal, community and global scales. Applies peace literacy skills to understand the historical foundations of complex issues today. Emphasis on how students can contribute to solving current scientific and social problems.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

PAX 402. INDEPENDENT STUDY. (1-16 Credits)
Individual basic and applied study projects on peace-related issues, designed in consultation with the Peace Studies Program director or a member of the Peace Studies faculty.
This course is repeatable for 16 credits.

PAX 405. READING AND CONFERENCE. (1-16 Credits)
Study supervised and directed by members of the Peace Studies Program committee or approved faculty, as arranged by the student and Peace Studies Program director.
This course is repeatable for 16 credits.

PAX 407. SEMINAR. (1-16 Credits)
Close examination of peace-related topics, including theory, method, research, and application. May be taken more than one time as topics vary.
This course is repeatable for 16 credits.

PAX 410. PEACE STUDIES INTERNSHIP. (1-16 Credits)
Directed, supervised, and evaluated field work, to supplement the student's classroom work, arranged one term in advance.
This course is repeatable for 16 credits.

PAX 415. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.
Equivalent to: PAX 415H
This course is repeatable for 16 credits.

PAX 415H. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAX 415
This course is repeatable for 16 credits.

PAX 499. TOPICS IN PEACE STUDIES. (1-4 Credits)
Examination of the work of a particular nonviolence theorist or of a specific problem; e.g., pacifism and humanitarian intervention, nonviolence and gender. Course may be repeated as appropriate. Not offered every year.
This course is repeatable for 8 credits.

PAX 502. INDEPENDENT STUDY. (1-16 Credits)
Individual basic and applied study projects on peace-related issues, designed in consultation with the Peace Studies Program director or a member of the Peace Studies faculty.
This course is repeatable for 16 credits.

PAX 505. READING AND CONFERENCE. (1-16 Credits)
Study supervised and directed by members of the Peace Studies Program committee or approved faculty, as arranged by the student and Peace Studies Program director.
This course is repeatable for 16 credits.

PAX 507. SEMINAR. (1-16 Credits)
Close examination of peace-related topics, including theory, method, research, and application. May be taken more than one time as topics vary.
This course is repeatable for 16 credits.

PAX 510. PEACE STUDIES INTERNSHIP. (1-16 Credits)
Directed, supervised, and evaluated field work, to supplement the student's classroom work, arranged one term in advance.
This course is repeatable for 16 credits.

PAX 515. TOPICS IN PEACE STUDIES. (1-16 Credits)
Selected topics relevant to the study of conflict, peace, and war. May be taken more than one time as topics vary.

PAX 599. TOPICS IN PEACE STUDIES. (1-4 Credits)
Examination of the work of a particular nonviolence theorist or of a specific problem; e.g., pacifism and humanitarian intervention, nonviolence and gender. Course may be repeated as appropriate. Not offered every year.
This course is repeatable for 8 credits.

Pharmacy (PHAR)

PHAR 001. SERVICE LEARNING. (0 Credits)
Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.

PHAR 002. LEADERSHIP. (0 Credits)
Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

PHAR 201. PHARMACY ORIENTATION. (1 Credit)
Career opportunities in pharmacy including community and institutional practice, government, and industry. Discussion of available educational pathways. Open to non-pharmacy students. Graded P/N.
PHAR 210. TERMINOLOGY OF THE HEALTH SCIENCES. (2 Credits)
Provides the student in any of the health science disciplines or pre-professional studies with a working knowledge of the terminology used in the health sciences. Open to non-pharmacy students.

PHAR 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 405. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 407. SEMINAR. (1-16 Credits)
One-credit section. Graded P/N.
This course is repeatable for 16 credits.

PHAR 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PHAR 505. READING & CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 507. SEMINAR. (1-16 Credits)
One-credit section. Graded P/N.
This course is repeatable for 16 credits.

PHAR 525. FOUNDATIONS OF DRUG ACTION I. (3 Credits)
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug absorption and distribution, drug design and characterization of drug interactions with specialized cellular components, and drug biotransformation or excretion.

PHAR 526. FOUNDATIONS OF DRUG ACTION III. (3 Credits)
Drug actions in the autonomic nervous system (ANS) provide a template for understanding drug actions throughout the body. This course provides a complete consideration of pharmacologic and medicinal chemistry principles as they relate to drug interactions with the ANS. Treatment options for selected diseases that respond to drugs acting on the ANS are also addressed.

PHAR 527. FOUNDATIONS OF DRUG ACTION II. (3 Credits)
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug activation of biological response via biochemical or molecular transduction mechanisms, pharmacogenetics and pharmacogenomics, and drug-induced toxicities.

PHAR 537. BIOORGANIC CHEMISTRY. (3 Credits)
A contemporary treatment of the chemistry, enzymology and molecular genetics techniques used in studying major natural products biosynthesis pathways in nature. Offered alternate years.
Recommended: (CH 530, CH 531, CH 535) and (BB 590, BB 591, BB 592)

PHAR 563. CANCER AND CHEMOPREVENTION. (2 Credits)
A summary of mechanisms of cancer progression, how cancer is detected, and introduction to chemoprevention using targeted therapy and alternative medicine.
Recommended: (BB 451 or BB 551) and BI 314 and (BI 460 or BI 560) or second year standing in the PharmD program

PHAR 571. EXPERIMENTAL APPROACH TO BIOPHARMACEUTICS. (3 Credits)
Experimental protocol, rationale, and procedures in clinical pharmacokinetic, pharmacokinetic, and biopharmaceutical experiments.
Recommended: PHAR 750

PHAR 572. APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS. (3 Credits)
Pharmacokinetics and bioavailability of drugs in clinical care, including changing disease states.

PHAR 573. CURRENT TOPICS IN PHARMACEUTICAL SCIENCES. (1-3 Credits)
Critical evaluation of contemporary pharmaceutics and pharmacokinetics research articles.
This course is repeatable for 9 credits.

PHAR 574. NANOMEDICINE. (3 Credits)
Introduction to the interdisciplinary field of nanomedicine, the use of nanoscale (1-100 nm) phenomena and materials in biomedical applications. Reviews the basic principles of nanotechnology relevant to areas such as diagnostic/molecular imaging, drug delivery, and other novel therapeutics. Topics will be described through both survey of historical developments and the latest scientific developments in the field of nanomedicine.

PHAR 591. PHARMACOLOGY I. (5 Credits)
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacological rationale for therapeutic and toxicologic treatment outcomes.

PHAR 592. PHARMACOLOGY II. (5 Credits)
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacologic rationale for therapeutic and toxicologic treatment outcomes.

PHAR 593. PHARMACOLOGY III. (5 Credits)
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacologic rationale for therapeutic and toxicologic treatment outcomes.

PHAR 601. RESEARCH. (1-16 Credits)
This course is repeatable for 99 credits.

PHAR 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PHAR 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

PHAR 669. INTRODUCTION TO GRANT PROPOSAL WRITING. (2 Credits)
To introduce students to the fundamentals of writing grant proposals to the National Institute of Health (NIH), different funding mechanisms, as well as the grant reviewing process. CROSSLISTED as PHAR 669/VMB 669.
Equivalent to: VMB 669
This course is repeatable for 20 credits.

PHAR 699. SPECIAL TOPICS IN PHARMACEUTICAL SCIENCES. (3 Credits)
This course is repeatable for 99 credits.

PHAR 701. RESEARCH AND SCHOLARSHIP. (1-8 Credits)
Research conducted by professional pharmacy students under faculty supervision.
This course is repeatable for 12 credits.

PHAR 703. THESIS. (1-8 Credits)
Independent study and analysis that culminates in a thesis.
This course is repeatable for 999 credits.
PHAR 704. RESEARCH SEMINAR. (1 Credit)
This course is repeatable for 2 credits.
Recommended: First or second year standing PharmD program

PHAR 705. READING AND CONFERENCE. (1-8 Credits)
May be repeated for credit.
This course is repeatable for 12 credits.

PHAR 706. INTRODUCTION TO HEALTH DISPARITIES. (2 Credits)
An examination of the multifaceted issue of health disparities in the U.S. healthcare system. Marginalized groups with disparities based upon racial/ethnic, gender, sexual preference and identity, disability, physical and mental health, geography and socioeconomics will be examined at the individual, systematic, and institutional levels.
Recommended: PHAR 707

PHAR 707. CAREER PERSPECTIVES AND PROFESSIONAL DEVELOPMENT. (2 Credits)
Students will explore the necessary knowledge, skills and abilities in order to support professional role formation and ongoing professional development. Students will practice skills related to identifying personal strengths and weaknesses, building self-awareness, creating professional job search materials, communicating professionally in written and oral formats, and participating as a team member.
Recommended: First-year standing in the PharmD program

PHAR 708. INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE I. (2 Credits)
Students will be placed in community pharmacies for experiential rotations. Students will gain an understanding of the scope of practice and roles of pharmacy personnel while demonstrating skills related to processing and dispensing functions in the community setting. Students will observe patient counseling and have an opportunity to conduct medication reviews to identify any drug-related problems. In-class discussions of patient cases will explore concepts relating to ethical decision-making, cultural sensitivity and coordinated pharmacy practice topics with other first-year courses.
Recommended: PHAR 707

PHAR 709. INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE II. (2 Credits)
Students will be placed in community pharmacies for experiential rotations. Students will gain an understanding of the scope of practice and roles of pharmacy personnel while demonstrating skills related to processing and dispensing functions in the community setting. Students will observe patient counseling and have an opportunity to conduct medication reviews to identify any drug-related problems. In-class discussions of patient cases will explore concepts relating to ethical decision-making, cultural sensitivity and coordinated pharmacy practice topics with other first-year courses.
Recommended: PHAR 708

PHAR 711. FUNDAMENTALS OF INTERPROFESSIONAL COLLABORATION. (1 Credit)
The first professional year IPE Series is a yearlong course focusing on interprofessional education for students from local colleges (LBCC/OSU/WesternU) representing programs in medical assistant, pharmacy, nursing and osteopathic medicine. Students develop a positive perspective of working with other disciplines, enhanced understanding of their specific role and responsibilities on an interprofessional team, recognize the value of other disciplines providing patient-centered care, and develop a shared accountability for providing patients with safe, high-quality health care.
Recommended: First-year standing in the PharmD program

PHAR 712. FOUNDATIONS OF PATIENT SAFETY AND INTERPROFESSIONAL PRACTICE. (1 Credit)
Techniques, best practices and opportunities for improving patient safety through interprofessional teamwork. Graded P/N.

PHAR 713. SPANISH FOR PHARMACY PROFESSIONALS. (2 Credits)
For the pharmacy professional with little or no Spanish language background (those with some Spanish language skills would find it beneficial). The course is presented in a video format with in-class facilitator for discussion. Provides basic Spanish grammar instruction but the focus will be on vocabulary and communication in a community pharmacy environment.

PHAR 714. COMPLEMENTARY MEDICINE. (3 Credits)
Covers vitamins and microminerals and their role in biochemical processes, maintaining health and preventing disease. The course also covers the etiology of obesity and treatment modalities. The course builds upon the general background of students in biochemistry and physiology to provide a common baseline of knowledge and allow for integration of concepts required to understand preventive medicine.
Recommended: PHAR 729 and PHAR 735

PHAR 715. PRESCRIPTION DRUG ABUSE. (2 Credits)
Examines the issue of prescription drug abuse among the general population. Graded P/N.

PHAR 716. HEALTHCARE CHALLENGES FOR PERSONS WITH DISABILITIES. (1 Credit)
Students develop an understanding of healthcare challenges faced by persons with physical and mental disabilities. Graded P/N.
This course is repeatable for 2 credits.

PHAR 717. SENIOR CARE PHARMACY. (2 Credits)
Provides an overview of senior care pharmacy practice including an introduction to the senior patient, the senior care healthcare environment, medication-related problems in the elderly, the role of the pharmacist as a member of the interdisciplinary senior healthcare team, and employment opportunities in senior care pharmacy. Graded P/N.
Equivalent to: PHAR 721
Recommended: First-year standing PharmD program and PHAR 723 and PHAR 735 and PHAR 739

PHAR 718. NATURAL PRODUCT DRUG DEVELOPMENT. (2 Credits)
Overview of the process of drug development, with an emphasis on natural product sources of lead components. Top-selling and mainstay drugs will be researched in literature assignments and discussed to illustrate historical and current drug development paradigms. In addition, future approaches to drug discovery and paradigm shifts to incorporate concepts such as network pharmacology will be explored.
Equivalent to: PHAR 722

PHAR 719. POISONS AND TOXINS. (2 Credits)
Covers many different types of substances, including common household poisons, poisonous plants and mushrooms, toxic gases/metals, shellfish toxins, and other natural toxins. Aspects of the chemistry and pharmacology of the poisons, antidotes/treatments, and occasional case studies will be covered. Historical examples and current events will also be incorporated into the course materials.
Equivalent to: PHAR 723
Recommended: PHAR 735
PHAR 720. PHARMACY PRACTICE I-PRINCIPLES OF INTEGRATED PATIENT CARE. (4 Credits)
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations.
Recommended: First-year standing in PharmD program

PHAR 721. PHARMACY PRACTICE II. (3 Credits)
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations.
Recommended: PHAR 720

PHAR 722. PHARMACY PRACTICE III: PRINCIPLES OF INTEGRATED PATIENT CARE. (4 Credits)
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations.
Recommended: PHAR 721

PHAR 726. PRINCIPLES OF EVIDENCE-BASED MEDICINE II: DRUG LIT EVAL. (3 Credits)
Students will learn to critique and evaluate health-related scientific journal articles using valid established techniques.
Recommended: Second-year standing in PharmD program

PHAR 728. PHARMACY LAW. (2 Credits)
Introduces the student to the federal and state agencies and regulations that govern pharmacy practice and provides students with foundational knowledge and skills to comply with state and federal regulations. Emphasis will be on regulations from the Food and Drug Administration, Drug Enforcement Administration, and Oregon Board of Pharmacy.
Recommended: First year standing in PharmD program

PHAR 729. PRINCIPLES OF EVIDENCE-BASED MEDICINE I: INFORMATION SCIENCE. (3 Credits)
Students will learn to identify appropriate information resources and will systematically collect, arrange, and analyze pertinent information related to a particular patient or drug product problem.
Equivalent to: PHAR 739
Recommended: First-year standing in PharmD program

PHAR 733. PHARMACEUTICS I. (3 Credits)
Foundational perspectives in physical pharmacy with an emphasis on liquid and parenteral products. Properties and processes that influence compatibility and stability in drug formulation are discussed. Varied types of sterile and non-sterile formulations, including product optimization for drug delivery and patient specific considerations, are examined.
Recommended: PHAR 735

PHAR 734. PHARMACEUTICS II. (3 Credits)
Preformulation and formulation factors affecting the development, production and use of pharmaceutical dosage forms, including ingredients in, and physical, chemical, and biological properties affecting storage, stability, and handling of dosage forms. Lec/lab. Approved for use on a graduate program of study.
Recommended: PHAR 733 and PHAR 735

PHAR 735. FOUNDATIONS OF DRUG ACTION I. (3 Credits)
Introductory course into actions of chemicals on physiological systems. Concepts encompass drug absorption and distribution, drug design and characterization of drug interactions with specialized cellular components, drug activation of biological response via biochemical or molecular transduction mechanisms, drug-induced toxicities and drug biotransformation or excretion. Approved for use on a graduate program of study.
Equivalent to: PHAR 762
Recommended: First-year standing in PharmD program

PHAR 736. DRUG ACTION III: AUTONOMIC DRUG ACTION. (3 Credits)
Drug actions in the autonomic nervous system (ANS) provide a template for understanding drug actions throughout the body. This course provides a complete consideration of pharmacologic and medicinal chemistry principles as they relate to drug interactions with the ANS. Treatment options for selected diseases that respond to drugs acting on the ANS are also addressed.
Recommended: PHAR 735 and PHAR 737

PHAR 737. DRUG ACTION II: PHARMACOGENOMICS, PHARMACOLOGY & TOXICOLOGY. (3 Credits)
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug activation of biological response via biochemical or molecular transduction mechanisms, pharmacogenetics and pharmacogenomics, and drug-induced toxicities. Approved for use on graduate program of study.
Recommended: PHAR 735

PHAR 738. HEALTHCARE SYSTEMS I. (3 Credits)
Examination of the U.S. healthcare industry and how it relates to pharmacy. Emphasis is given to changing relationships between healthcare systems, patients, providers of care, hospitals, insurers, employers and the government.
Recommended: First-year standing in the PharmD program

PHAR 739. HEALTHCARE SYSTEMS II. (2 Credits)
Population-based strategies for improving health and wellness with an emphasis on prevention rather than treatment. We will also look at how social determinants of health affect peoples' ability to be healthy and how the safety net seeks to close the gap for those who have limited access or resources.
Recommended: PHAR 738

PHAR 740. PHARMACY PRACTICE IV. (3 Credits)
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information.
Recommended: PHAR 722 and concurrent enrollment in PHAR 752

PHAR 741. PHARMACY PRACTICE V. (3 Credits)
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. Lec/lab.
Recommended: PHAR 740. Concurrent enrollment in PHAR 744 and PHAR 753
PHAR 742. PHARMACY PRACTICE VI. (3 Credits)
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. Lec/lab.
Recommended: PHAR 741. Concurrent enrollment in PHAR 745 and PHAR 754

PHAR 743. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE: COMMUNITY III. (2 Credits)
Students are assigned to community, institutional and ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course.
Recommended: Concurrent enrollment in PHAR 740

PHAR 744. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE: AMBULATORY CARE I. (2 Credits)
Students are assigned to institutional or ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course. Graded P/N.
Recommended: Concurrent enrollment in PHAR 742 and PHAR 754

PHAR 746. PHARMACY MANAGEMENT. (3 Credits)
Using a case-based format, students will work in groups to “solve” using SOAP notes real-world scenarios based in different pharmacy settings. The cases are organized around the major focus areas listed in the schedule. Each group will present their solution and a recap of the actual outcome will be provided whenever available.

PHAR 747. INFECTIOUS DISEASES AND TREATMENTS. (3 Credits)
Introduction to infectious disease processes and antimicrobial agents, including general clinical microbiology, and structure mechanism of action of anti-bacterials and anti-fungal agents.

PHAR 748. DRUG ACTIONS IN IMMUNOLOGY AND INFLAMMATION. (3 Credits)
Review of foundational concepts in immunology, inflammation and tissue repair; and modification of these processes therapeutically through an understanding and application of anti-inflammatory agents and immune system modulators.

PHAR 750. PHARMACOKINETICS AND BIOPHARMACEUTICS. (4 Credits)
Pharmacokinetics and bioavailability of drugs in clinical care, including changing disease states. Approved for use on a graduate program of study.
Recommended: PHAR 735

PHAR 752. INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS I. (7 Credits)
Drug therapy of central nervous system disorders; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 736

PHAR 753. INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS II. (7 Credits)
Drug therapy of pulmonary and cardiovascular disorders; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 752

PHAR 754. INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS III. (7 Credits)
Drug therapy of endocrine disorders, and men's and women's health issues; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 753

PHAR 760. INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: INSTITUTIONAL. (2 Credits)
Students gain familiarity with the provision of patient centered care through the variety of pharmacy services within a health system. Experiences include introduction to acute care services, transitions of care, and introduction to health systems pharmacy. Emphasis is on learning how to ensure patient medication safety by understanding the process of preparing and distributing medication, collecting and analyzing relevant patient information, and providing guidance regarding medication administration and monitoring.
This course is repeatable for 6 credits.
Recommended: Concurrent enrollment in PHAR 761 and PHAR 764

PHAR 761. ADVANCED INTEGRATED DRUG THERAPY I. (8 Credits)
Pathophysiologic basis of disease and drug therapy management.
Recommended: Concurrent enrollment in PHAR 764 and PHAR 770

PHAR 762. ADVANCED INTEGRATED DRUG THERAPY II. (8 Credits)
Pathophysiologic basis of disease and drug therapy management.
Recommended: Concurrent enrollment in PHAR 765

PHAR 763. PATHOPHYSIOLOGY AND THERAPEUTICS III. (7 Credits)
Pathophysiologic basis of disease and drug therapy management. Equivalent to: PHAR 736
Recommended: PHAR 762. Concurrent enrollment in PHAR 766 and PHAR 774

PHAR 764. PHARMACY PRACTICE VII. (3 Credits)
Development of skills for advanced drug therapy problem identification, assessment, and plan resolution for patients with diseases discussed in PHAR 752, 753, 754, 761 and PHAR 762. Students will integrate interviewing, physical assessment, and problem-solving to identify, assess, and resolve drug therapy problems and communicate findings in SOAP notes, care plans, and case presentations.
Recommended: PHAR 742 and concurrent enrollment in PHAR 761

PHAR 765. PHARMACY PRACTICE VIII. (3 Credits)
Development of skills for application of didactic learning to case-based drug therapy problem identification, assessment, and plan. Content draws on PHAR 761, and PHAR 762, as well as earlier course work. Students will integrate knowledge from multiple courses to problem-solve drug therapy concerns, and communicate findings both orally and in written format.
Recommended: PHAR 761 and PHAR 764. Concurrent enrollment in PHAR 762
PHAR 766. PHARMACY PRACTICE IX. (3 Credits)
Development of skills for advanced drug therapy problem identification, assessment, and plan resolution for patients with diseases discussed in PHAR 761, PHAR 762, PHAR 763. Students will integrate interviewing, physical assessment, and problem-solving to identify, assess, and resolve drug therapy problems, and communicate findings in SOAP notes, care plans, and case presentations. Lec/lab/rec.
Recommendations: PHAR 762 and PHAR 765. Concurrent enrollment in PHAR 760 and PHAR 763 and PHAR 772

PHAR 767. PRE-APPE READINESS AND COMPLEX CASE ANALYSIS. (3 Credits)
Confidence and competence needed for advanced practice settings are enhanced utilizing a mixture of benchmark assessment tools and small case discussions of complex patient cases. The focus is to assure readiness to integrate into inter-professional collaborative health care settings and serve diverse patient populations. Knowledge, skills, attitudes, and professional values are assessed and developed. Formative and summative feedback delivered through faculty, peer and self-evaluation help guide student preparation for advanced experiences and life-long learning. Graded P/N.
Recommendations: PHAR 760 and PHAR 762 and PHAR 765 and PHAR 773

PHAR 768. ETHICAL AND LEGAL DECISION MAKING. (1 Credit)
Student understanding of pharmacy law is assessed, and discussed in the context of pharmacists’ ability to properly respond when legal concepts may not align with ethical decision making in a health profession. Students will apply a framework for ethical decision making and identify personal strategies to maintain currency in pharmacy law and applied ethical decision making.
Recommendations: PHAR 760 and PHAR 762 and PHAR 765 and PHAR 773

PHAR 770. ADVANCED PHARMACOKINETICS. (4 Credits)
A physiologic approach to understanding advanced pharmacokinetic principles. Approved for use on a graduate program of study.
Recommendation: PHAR 750

PHAR 773. EVIDENCE BASED MEDICINE III. (3 Credits)
Covering the principles required for evidence-based medicine, including interpreting and applying results from clinical, humanistic, and economic research to medical decision-making.
Recommendation: PHAR 726

PHAR 774. EVIDENCE BASED MEDICINE IV. (3 Credits)
Covers a variety of topics related to drug policy and drug use management. Population-based strategies to improve drug use will be emphasized along with developing an evidence-based process for evaluating new drugs. A major course project, evaluating a new drug, will focus on application of principles taught in this and previous courses.
Recommendation: PHAR 773

PHAR 776. PHARMA-CSI. (2 Credits)
Application of PK, PD, and P’genomic concepts, principles, and equations in computer workshops to solve drug therapy misadventures. Approved for use on a graduate program of study.
Recommendation: PHAR 770 and third-year standing in the PharmD program

PHAR 777. ACUTE MEDICAL EMERGENCIES. (2 Credits)
Drug therapy management in the critically ill patient. Graded P/N.
Recommendation: PHAR 762

PHAR 778. ADVANCED ADULT MEDICINE. (2 Credits)
Adult medicine elective utilizes actual patient cases to enhance knowledge of pharmacy and the pharmacologic basis of therapeutics in the setting of adult medicine, emphasizing application or current guidelines and major clinical trials for commonly encountered disease states. Graded P/N.
Recommendations: Third-year standing in PharmD program and PHAR 761 and PHAR 762 and PHAR 764 and PHAR 765

PHAR 780. COMMUNITY PHARMACY CLERKSHIP. (8 Credits)
Supervised advanced professional education in ambulatory care pharmacy practice environment. Emphasis is placed on the application of direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess and monitor pharmacotherapy of acute and chronic diseases in addition to providing drug information. Graded P/N.
Equivalent to: PHAR 785
This course is repeatable for 32 credits.
Recommendations: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 785. AMBULATORY PRIMARY CARE CLERKSHIP. (8 Credits)
Supervised advanced professional education in ambulatory care pharmacy practice environment. Emphasis is placed on the application of direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess and monitor pharmacotherapy of acute and chronic diseases in addition to providing drug information to patients and health care professionals. Graded P/N.
This course is repeatable for 32 credits.
Recommendations: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 790. GENERAL INTERNAL MEDICINE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in internal medicine inpatient pharmacy practice environment. Emphasis is placed on the application of biomedical and pharmaceutical sciences to direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess, and monitor pharmacotherapy involved in a wide variety of acute and chronic diseases. In addition, students will provide drug information to other health care professionals and patients. Graded P/N.
This course is repeatable for 32 credits.
Recommendations: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 792. HOSPITAL/HEALTH SYSTEMS PATIENT CARE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in various hospital or health care systems patient care-oriented settings. Emphasis is placed on application of pharmaceutical sciences and pharmacotherapy to patient care. Graded P/N.
This course is repeatable for 32 credits.
Recommendation: Fourth-year standing in the PharmD program
PHAR 795. PATIENT CARE ELECTIVE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in various patient care-oriented settings. Emphasis is placed on the application of pharmaceutical sciences and pharmacotherapy to direct and indirect pharmaceutical care. Specialties include but are not limited to geriatrics, pediatrics, infectious disease, oncology, general patient care, nutrition support, nuclear pharmacy, home infusion, critical care, anticoagulation, pain management, etc. Graded P/N.
This course is repeatable for 24 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 797. ELECTIVE CLERKSHIP. (8 Credits)
Supervised advanced professional education located in various pharmacy-oriented settings. Emphasis is placed on the application of pharmaceutical sciences and pharmacotherapy to a variety of environments involving pharmacy. Specialties include but are not limited to managed care, drug information, administration, pharmaceutical research, pharmaceutical industry, professional pharmacy organizations, etc. Graded P/N.
This course is repeatable for 24 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 798. PHARMACY HEALTH ADMINISTRATION. (8 Credits)
Provides students the opportunity to integrate and apply leadership and business principles necessary to operate and manage a pharmacy business or department in a diverse organizational environment.
This course is repeatable for 16 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 799. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Philosophy (PHL)

PHL 101. CRITICAL THINKING. (4 Credits)
Analysis of arguments, basic patterns of inductive and deductive reasoning, logical relations, and logical fallacies. Intended to improve analytical, critical and reasoning skills.

PHL 110. CRITICAL ANALYSIS. (3 Credits)
Development of a question-asking attitude for academic study. Enables students to explore issues and make informed decisions.

PHL 121. *REASONING AND WRITING. (3 Credits)
Develops critical thinking skills to increase clarity and effectiveness of student writing; uses writing experiences to teach critical thinking skills. Subjects include identifying and evaluating arguments, analyzing assumptions, justifying claims with reasons, avoiding confused or dishonest reasoning, applying common patterns of reasoning in everyday contexts, and writing cogent complex arguments. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Equivalent to: PHL 121H

PHL 150. *GREAT IDEAS IN PHILOSOPHY. (3 Credits)
Explores the assumptions and deeper meanings of familiar concepts and experiences. An introduction to some basic and famous ideas in Western thought. Topics may include truth, beauty, infinity, perception, freedom, pleasure, knowledge, mind and body, morality, justice, and political authority. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

PHL 160. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam. Lec/rec. CROSSLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160H, REL 160, REL 160H

PHL 160H. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam. Lec/rec. CROSSLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, REL 160, REL 160H

PHL 170. *THE IDEA OF GOD. (4 Credits)
Concepts and images of God and their connections to world-views, experience, science, gender, society, self-understanding, and religions. CROSSLISTED as PHL 170/REL 170. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: REL 170

PHL 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies.
Equivalent to: PHL 199H
This course is repeatable for 16 credits.

PHL 201. *INTRODUCTION TO PHILOSOPHY. (4 Credits)
An in-depth introduction to the methods and ideas of Western philosophy, concentrating on such great figures as Socrates, Plato, Aristotle, Descartes, Kant and Nietzsche and such topics as the nature of reality, the existence of God, knowledge and doubt, the relation of consciousness to the world, free will and determinism, good and evil, and minds and machines. Philosophers and ideas covered will vary by the section. Written assignments are required. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core

PHL 202. INTRODUCTION TO RELIGIOUS STUDIES. (4 Credits)
An introduction to the academic study of religion. It examines the concepts of religion and the sacred, approaches to the study of religion, ubiquitous features of religious experience, including symbol, myth, ritual, and community, understandings of the human condition in diverse religious traditions, and ways religious communities address challenges of pluralism and secularization. CROSSLISTED as PHL 202/REL 202.
Equivalent to: REL 202

PHL 203. *THE MEANING OF EXISTENCE. (4 Credits)
Introduction to existentialism; explores different philosophical approaches to the significance of human life, meaning, and freedom. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

PHL 205. *ETHICS. (4 Credits)
Introduction to ethical theory and to the evaluation of ethical issues in society such as sexual ethics and euthanasia. Includes the study of philosophical theories of moral responsibility and moral virtue, and the philosophical ideas behind ethics debates in society. Students are encouraged to develop their own positions on ethical issues through discussion projects and term papers. Lec/rec. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 205H
PHL 205H. *ETHICS. (4 Credits)
Introduction to ethical theory and to the evaluation of ethical issues in society such as sexual ethics and euthanasia. Includes the study of philosophical theories of moral responsibility and moral virtue, and the philosophical ideas behind ethics debates in society. Students are encouraged to develop their own positions on ethical issues through discussion projects and term papers. Lec/rec. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 205

PHL 206. *RELIGIOUS ETHICS AND MORAL PROBLEMS. (4 Credits)
An examination of the practical ethics of the monotheistic religious traditions of the West–Judaism, Christianity, Islam–and their different approaches to concrete moral problems. Topics include sexuality and marriage, euthanasia, capital punishment, pacifism and just war, and environmentalism. CROSSLISTED as PHL 206/REL 206. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: REL 206

PHL 207. *POLITICAL PHILOSOPHY. (4 Credits)
Introductory study of the philosophical justifications of political systems and philosophical theories about the rights and obligations of citizens and governments. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 207H

PHL 208. INTRODUCTION TO BUDDHIST TRADITIONS. (4 Credits)
Survey of the historical development of Buddhism in India and its spread throughout Asia and beyond by investigating the literature, rituals, history and social structure of the Buddhist traditions of Sri Lanka and Southeast Asia, Tibet and the Himalayan region, China, Taiwan, Korea, Japan, and finally its growth in the West. CROSSLISTED as PHL 208/REL 208. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: REL 208

PHL 209. *SELF AND SOCIETY. (4 Credits)
An introduction to social philosophy, addresses the interactions between the development of personal identity (self) and social structures, including social relations, institutions, norms and values. Includes issues in philosophical anthropology (what it means to be human), social theories of the self, and perspectives from feminist philosophy, post-colonial studies, and non-Western contributions in so-cial philosophy. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

PHL 210. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210H, REL 210

PHL 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present. CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210H, REL 210H

PHL 213. *INTRODUCTION TO HINDU TRADITIONS. (4 Credits)
Survey of the historical development of Hinduism in India and the ‘Hindu Diaspora.’ Topics will include the Indus Valley civilization, the Vedic tradition, yoga, and Hindu renunciation, ‘Classical’ Hindu theism and devotion, Hindu philosophy and ritual, and modern and contemporary Hinduism. CROSSLISTED as PHL 213/REL 213. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: REL 213

PHL 214. *INTRODUCTION TO ISLAMIC TRADITIONS. (4 Credits)
Development of Islamic traditions in the Arab world and in the global context. Origins of Islam, the narrative of the Prophet Muhammad, the development of the Qur’an, and the central tenets of Islamic faith and practice. Transformation of Islam from a regional to a global tradition. CROSSLISTED as PHL 214/REL 214. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: REL 214

PHL 220. *WORLD-VIEWS AND VALUES IN THE BIBLE. (4 Credits)
A study of central portions of the Bible (in the Old Testament: Torah, prophets, psalms, and wisdom; in the New Testament: Jesus, gospels, and letters) from the perspective of the academic discipline of biblical scholarship, exploring the philosophical questions of the relationships between story, myth, thought, values, and understandings of life. CROSSLISTED as PHL 220/REL 220. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 220H, REL 220

PHL 224. *PHILOSOPHY OF HAPPINESS. (3 Credits)
Explores various philosophical and psychological approaches to happiness and how culturally specific ideas of happiness have shaped the social and cultural realities around the world. Explores the human need for happiness within cultures. Examines happiness through the writings of the greatest Eastern and Western philosophers. Analyzes research on happiness within positive psychology.
Attributes: CPWC – Core, Pers, West Culture

PHL 251. *KNOWERS, KNOWING, AND THE KNOWN. (4 Credits)
An introduction to the major debates in Western philosophy concerning the nature of reality, and the ways we come to know about that reality. One example concerns debates about the problem of skepticism: Is it possible that humans could be completely mistaken about the way the world is? Another example concerns debates about human identity and free will. Beginning with historical figures such as Descartes and Hume, the course also provides an introduction to more contemporary thinkers. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 251H
PHL 251H. *KNOWERS, KNOWING, AND THE KNOWN. (4 Credits)
An introduction to the major debates in Western philosophy concerning
the nature of reality, and the ways we come to know about that reality.
One example concerns debates about the problem of skepticism: Is it
possible that humans could be completely mistaken about the way the
world is? Another example concerns debates about human identity and
free will. Beginning with historical figures such as Descartes and Hume,
the course also provides an introduction to more contemporary thinkers.
(Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course
Designator
Equivalent to: PHL 251

PHL 275. *INTRODUCTION TO DISABILITY STUDIES. (4 Credits)
Introduces core concepts and themes in the multidisciplinary field of
disability studies. Analyzes disability as a product of discriminatory,
oppressive, and inaccessible built environments and societies. Explores
disability pride, culture, and community as alternatives to medical
and charity models of disability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PHL 275H

PHL 275H. *INTRODUCTION TO DISABILITY STUDIES. (4 Credits)
Introduces core concepts and themes in the multidisciplinary field of
disability studies. Analyzes disability as a product of discriminatory,
oppressive, and inaccessible built environments and societies. Explores
disability pride, culture, and community as alternatives to medical and
charity models of disability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator
Equivalent to: PHL 275

PHL 280. *ETHICS OF DIVERSITY. (4 Credits)
Uses moral philosophy to examine difference-based discrimination and
prejudice in the human community. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
LACH – Liberal Arts Humanities Core
Equivalent to: PHL 280H

PHL 280H. *ETHICS OF DIVERSITY. (4 Credits)
Uses moral philosophy to examine difference-based discrimination and
prejudice in the human community. (H) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 280

PHL 295. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention
to intersections of race, social class, sexual identity, and nation in biblical
interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc
Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENG 295, ENG 295H, PHL 295H, WGSS 295, WGSS 295H

PHL 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention
to intersections of race, social class, sexual identity, and nation in biblical
interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc
Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course
Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, WGSS 295, WGSS 295H

PHL 299. SELECTED TOPICS. (1-16 Credits)
Equivalent to: PHL 299H
This course is repeatable for 99 credits.

PHL 301. *HISTORY OF WESTERN PHILOSOPHY. (4 Credits)
A study of the history of Western philosophy from the early Greeks
into the twentieth century. Designed to give an appreciation and
understanding of the Western philosophical tradition and the
philosophical foundations of Western civilization. May be taken
independently. PHL 301: Greek and Roman philosophy. PHL 302: The rise
of modern philosophy through Hume. PHL 303: Kant and the nineteenth
century. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts
Humanities Core
Recommended: 3 credits of philosophy

PHL 302. *HISTORY OF WESTERN PHILOSOPHY. (4 Credits)
A study of the history of Western philosophy from the early Greeks
into the twentieth century. Designed to give an appreciation and
understanding of the Western philosophical tradition and the
philosophical foundations of Western civilization. May be taken
independently. PHL 301: Greek and Roman philosophy. PHL 302: The rise
of modern philosophy through Hume. PHL 303: Kant and the nineteenth
century. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts
Humanities Core
Recommended: 3 credits of philosophy

PHL 303. *HISTORY OF WESTERN PHILOSOPHY. (4 Credits)
A study of the history of Western philosophy from the early Greeks
into the twentieth century. Designed to give an appreciation and
understanding of the Western philosophical tradition and the
philosophical foundations of Western civilization. May be taken
independently. PHL 301: Greek and Roman philosophy. PHL 302: The rise
of modern philosophy through Hume. PHL 303: Kant and the nineteenth
century. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts
Humanities Core
Recommended: 3 credits of philosophy

PHL 309. *SELF AND SOCIETY. (4 Credits)
As introduction to social philosophy, addresses the interactions between
the development of personal identity (self) and social structures,
including social relations, institutions, norms and values. Includes issues
in philosophical anthropology (what it means to be human), social
theories of the self, and perspectives from feminist philosophy, post-
colonial studies, and non-Western contributions in social philosophy.
(Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Recommended: Sophomore standing

PHL 310. *CRITICS OF RELIGION. (4 Credits)
An introduction to critiques of religion by Nietzsche, Freud, Marx, and
other influential thinkers. Examines the nature, scope, and effects
of criticisms that challenge the psychological, moral, political, and
epistemological foundations of religious belief, practice, and institutions.
CROSSLISTED as PHL 310/REL 310. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: REL 310

This course is repeatable for 99 credits.
PHL 312. *ASIAN THOUGHT. (4 Credits)
Familiarizes students with key figures in the history of Asian religious ideas and philosophy. While the emphasis will be on the philosophical traditions of Asia, it will quickly become apparent that philosophy and religion are not so easily distinguishable in many Asian traditions. Areas of thought studied will include Hindu, Buddhist, Confucian, and Taoist. CROSSLISTED as PHL 312/REL 312. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: REL 312

PHL 315. *GANDHI AND NONVIOLENCE. (4 Credits)
An examination of the life and work of Mohandas K. Gandhi, the 20th century activist and author, and the theory and practice of nonviolence in his life and work. Emphasis will be placed upon Gandhi's biographical narrative, the development of satyagraha, Gandhi’s nonviolent approach to social transformation, and post-Gandhian nonviolent movements. CROSSLISTED as PHL 315/REL 315. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PHL 315H, REL 315

PHL 316. INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS. (4 Credits)
The philosophical, social, cultural, and political reality of Mexican Americans and their historical roots in Mexico since the Spanish Conquest. Analysis of internal colonialism, racism, machismo, fatalism, alienation, cultural identity, as well as more contemporary including NAFTA, immigration, and U.S.-Mexican relations. CROSSLISTED as PHL 316/REL 316. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: REL 316

PHL 321. DEDUCTIVE LOGIC. (4 Credits)
Development of formal language and deductive systems for first-order, quantificational logic. Emphasis on translation of ordinary English statements into formal language. Discussion of the contrast between semantic and syntactic treatment of logical concepts.
Recommended: Upper-division standing or PHL 101.

PHL 325. *SCIENTIFIC REASONING. (4 Credits)
Introduction to and analysis of scientific reasoning. Emphasis on understanding and evaluation of theoretical hypotheses, causal and statistical models, and uses of scientific knowledge to make personal and public decisions. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: PHL 325H

PHL 342. CONTEMPORARY ETHICS. (4 Credits)
A study of significant ethical developments and issues in contemporary society, including ethical principles and concepts behind social debates on such matters as sexual ethics, abortion, discrimination, the uses of animals in scientific research, and responsibilities of corporations. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core
Recommended: PHL 205

PHL 344. *PACIFISM, JUST WAR, AND TERRORISM. (4 Credits)
An examination of the philosophical and theological issues pertaining to pacifism, justified war, and forms of terrorism in Islamic and Western traditions. Special attention is given to concepts of jihad, justifications of war, and restraints on conduct in war. CROSSLISTED as PHL 344/REL 344. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: PHL 344H, REL 344

PHL 345. *FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE. (4 Credits)
An examination of the religious, philosophical, political, and historical issues regarding religious freedom, conscience, and disestablishment as enshrined in the First Amendment and as illustrated by historical and contemporary examples of religious intolerance in the United States. CROSSLISTED as PHL 345/REL 345. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: REL 345

PHL 360. *PHILOSOPHY AND THE ARTS. (4 Credits)
Major philosophical theories about art and its meaning, from ancient to modern times. How philosophers have understood beauty, the imagination, art and knowledge, art and pleasure, art and emotion. Offered every other year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 360H
Recommended: 3 credits of philosophy or upper-division standing

PHL 360H. *PHILOSOPHY AND THE ARTS. (4 Credits)
Major philosophical theories about art and its meaning, from ancient to modern times. How philosophers have understood beauty, the imagination, art and knowledge, art and pleasure, art and emotion. Offered every other year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 360
Recommended: 3 credits of philosophy or upper-division standing

PHL 365. *LAW IN PHILOSOPHICAL PERSPECTIVE. (4 Credits)
A study of philosophical issues in the law through the examination of legal cases and major essays in jurisprudence. Special attention given to concepts of justice, responsibility, liberty, law, and legal ethics. Offered every other year. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: 3 credits of philosophy or upper-division standing

PHL 371. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. Not offered every year. CROSSLISTED as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 371H, REL 371
Recommended: 3 credits of philosophy or upper-division standing

PHL 371H. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. Not offered every year. CROSSLISTED as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 371, REL 371
Recommended: 3 credits of philosophy or upper-division standing

PHL 390. MORAL THEORIES. (3 Credits)
Examines the evolution of moral philosophy from the beginning of Western, Greek-based philosophy through contemporary moral theory, and will include philosophical questions about moral philosophy generally, virtue ethics, deontology, utilitarianism, environmental ethics, animal rights, and feminism and ecofeminism.
Prerequisites: PHL 205 with D- or better
PHL 399. SPECIAL TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific philosophical
problem; e.g., Wittgenstein, determinism, perception, philosophy of mind.
May be repeated for credit when topic varies. Not offered every year.
Equivalent to: PHL 399H
This course is repeatable for 16 credits.
Recommended: 3 credits of upper-division philosophy

PHL 399H. SPECIAL TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific philosophical
problem; e.g., Wittgenstein, determinism, perception, philosophy of mind.
May be repeated for credit when topic varies. Not offered every term.
Attributes: HNRS – Honors Course Designator
Equivalent to: PHL 399
This course is repeatable for 16 credits.
Recommended: 3 credits of upper-division philosophy

PHL 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: PHL 405H
This course is repeatable for 16 credits.
Recommended: Sophomore standing

PHL 407. *SEMINAR. (1-16 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: PHL 407H
This course is repeatable for 16 credits.
Recommended: Two upper-division philosophy courses and sophomore
standing

PHL 407H. *SEMINAR. (1-16 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; HNRS – Honors Course Designator
Equivalent to: PHL 407
This course is repeatable for 16 credits.
Recommended: Two upper-division philosophy courses and sophomore
standing

PHL 410. INTERNSHIP. (1-12 Credits)
This course is repeatable for 16 credits.

PHL 411. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle,
Descartes, Hume, Kant, or Marx. Each course normally devoted to the
work of a single figure. Need not be taken in sequence. Not offered every
year. CROSSLISTED as PHL 411/REL 411 and PHL 511/REL 511. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: REL 411
This course is repeatable for 16 credits.
Recommended: 6 credits of philosophy and sophomore standing.

PHL 417. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques,
especially those based on race and class, with in-depth consideration of
selected social issues such as rape and pornography. CROSSLISTED as
PHL 417/WGSS 417 and PHL 517/WGSS 517. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: WGSS 417, WS 417
Recommended: 6 credits of philosophy or upper-division standing.

PHL 421. MATHEMATICAL LOGIC. (3 Credits)
Rigorous definition of a formal logic and investigation of its
characteristics. Emphasis on the distinction and relation between
semantic and syntactic methods (model theory and proof theory) and on
the meta-mathematical analysis of axiomatic theories. Not offered every
year.
Recommended: PHL 321 or 6 credits of 400-level mathematics or
computer science and sophomore standing.

PHL 430. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in
Buddhist history, emphasizing its Indian origins, but looking beyond to the
various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/
REL 430 and PHL 530/REL 530. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 430H, REL 430

PHL 430H. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in
Buddhist history, emphasizing its Indian origins, but looking beyond to the
various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/
REL 430 and PHL 530/REL 530. (NC)
Attributes: HNRS – Honors Course Designator; LACN – Liberal Arts Non-
Western Core
Equivalent to: PHL 430, REL 430

PHL 431. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-
violence, justice and social responsibility. Looks at broad-based Buddhist
social activism movements and leaders; their methods of training,
issues and types of actions taken by 'Socially Engaged Buddhists' living
Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/
REL 531.
Equivalent to: PHL 431H, REL 431

PHL 431H. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-
violence, justice and social responsibility. Looks at broad-based Buddhist
social activism movements and leaders; their methods of training,
issues and types of actions taken by 'Socially Engaged Buddhists' living
Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/
REL 531.
Attributes: HNRS – Honors Course Designator
Equivalent to: PHL 431, REL 431

PHL 432. *YOGA AND TANTRIC TRADITIONS. (4 Credits)
An examination of the theory and practice of yoga and tantra in the
traditions of Hinduism, Buddhism, and Jainism, and in their contemporary
popular manifestations. Emphasis on the representation of yoga and
tantra in Indian literature and history, including contemplative practices,
body disciplines, and ritual. CROSSLISTED as PHL 432/REL 432 and
PHL 532/REL 532. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: REL 432
PHL 433. *THEORY AND PRACTICE OF MODERN YOGA. (4 Credits)
An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga, Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSLISTED as PHL 433/REL 433 and PHL 533/REL 533. (Bacc Core Course)

Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: REL 433

PHL 434. *SPIRITUALITY AND ECOCULTURE: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.

Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 434H, REL 434, REL 434H

PHL 434H. *SPIRITUALITY AND ECOCULTURE: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.

Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: PHL 434, REL 434, REL 434H

PHL 436. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.

Equivalent to: REL 436
Recommended: 6 credits of philosophy and sophomore standing.

PHL 439. PHILOSOPHY OF NATURE. (3 Credits)
Intensive one-week field course taught in the Cascade Range. What is nature? What is the relation of humans to the rest of the natural world? How are our concepts of nature and decisions about land use shaped by the words and metaphors we use? What is the value of wild places? What can we learn from a close study of the natural world about right ways of acting in communities, both civic and biotic? The course will draw on many ways of knowing—philosophical analysis, close observation, and especially writing. Camping required.

PHL 440. *ENVIRONMENTAL ETHICS. (3 Credits)
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity. (H) (Bacc Core Course)

Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 440H
Recommended: PHL 205 and PHL 342 and PHL 365 or 6 credits of philosophy and sophomore standing.

PHL 440H. *ENVIRONMENTAL ETHICS. (3 Credits)
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity. (H) (Bacc Core Course)

Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 440H, REL 444, REL 444H

PHL 443. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)

Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443H, REL 443, REL 443H
Recommended: One introductory-level science course and sophomore standing.

PHL 443H. *WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)

Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443H, REL 443, REL 443H
Recommended: One introductory-level science course and sophomore standing.

PHL 444. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444H, REL 444, REL 444H

PHL 444H. *BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444H, REL 444, REL 444H
PHL 448. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548. (NC)
Attributes: LACN – Liberal Arts Non-Western Core  
Equivalent to: ES 448, REL 448

PHL 450. TOPICS. (1-16 Credits)
Uses the IDEAS MATTER lectures as the focus for an exploration of ideas that make a difference in the world. Students read background materials, attend lectures, meet with the speakers, and write essays on the ideas they learn.
This course is repeatable for 16 credits.

PHL 451. KNOWLEDGE AND REALITY. (3 Credits)
Examination of significant theories of knowledge, theories concerning the nature of reality, and their connections. Includes an analysis of important concepts and problems, such as perception, induction, belief, empiricism, rationalism, and skepticism. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core  
Recommended: 6 credits of philosophy, sophomore standing

PHL 455. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSLISTED as PHL 455/REL 455 and PHL 555/REL 555.
Equivalent to: REL 455  
Recommended: 6 credits of philosophy or sophomore standing.

PHL 456. PHILOSOPHY OF MIND. (4 Credits)
Past and present theories about consciousness, the relationship of mind and body, and the roots and implications of those theories. Includes historical ‘isms’ (e.g., dualism, monism), contemporary views, and connections of these theories to further issues in philosophy and contemporary culture, e.g., desires, mental illness, personhood and otherness, animal minds, explanation, the mind in non-Western traditions and in religions.
Recommended: PHL 251

PHL 461. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSLISTED as PHL 461/REL 461 and PHL 561/REL 561.
Equivalent to: REL 461

PHL 470. PHILOSOPHY OF SCIENCE. (3 Credits)
Examination of philosophical questions, classic and contemporary, about science and scientific knowledge. Scientific explanations, the structure of theories, the concept of a natural law, revolutions in science, influences of the sciences and philosophy on one another, science and values. Not offered every year. (H)
Attributes: LACH – Liberal Arts Humanities Core  
Recommended: 6 credits of upper-division philosophy and sophomore standing

PHL 474. *PHILOSOPHY OF BIOLOGY. (4 Credits)
An introduction to some of the conceptual challenges engendered by contemporary evolutionary biology, including the nature of fitness, natural selection, adaptations, and species; identifying organisms, traits, and the units of selection; the evidence required to support particular adaptive or historical hypotheses; and others. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC  
Recommended: Previous university-level course work in either philosophy or the biological sciences

PHL 499. TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific problem; e.g., Wittgenstein, determinism, perception. May be repeated for credit when topic varies. Not offered every year.
Equivalent to: PHL 499H  
This course is repeatable for 16 credits.
Recommended: 6 credits of upper-division philosophy, sophomore standing.

PHL 499H. TOPICS IN PHILOSOPHY. (1-4 Credits)
Examination of the work of a philosopher or of a specific problem; e.g., Wittgenstein, determinism, perception. May be repeated for credit when topic varies. Not offered every year.
Attributes: HNRS – Honors Course Designator  
Equivalent to: PHL 499  
This course is repeatable for 4 credits.
Recommended: 6 credits of upper-division philosophy, sophomore standing

PHL 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PHL 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PHL 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
Recommended: Two upper-division philosophy courses

PHL 510. INTERNSHIP. (1-12 Credits)
This course is repeatable for 16 credits.

PHL 511. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle, Descartes, Hume, Kant, or Marx. Each course normally devoted to the work of a single figure. Need not be taken in sequence. Not offered every year. CROSSLISTED as PHL 411/REL 411 and PHL 511/REL 511.
Equivalent to: REL 511  
This course is repeatable for 16 credits.

PHL 517. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class, with in-depth consideration of selected social issues such as rape and pornography. CROSSLISTED as PHL 417/WGSS 417 and PHL 517/WGSS 517.
Equivalent to: WGSS 517, WS 517  
Recommended: 6 credits of philosophy
PHL 525. PHILOSOPHICAL METHODS. (3 Credits)
Examines diverse ways of approaching philosophical issues. Contains readings from different philosophical traditions. Develops understanding of the skills and conventions of philosophical argumentation.

PHL 530. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/REL 430 and PHL 530/REL 530.
Equivalent to: REL 530

PHL 531. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists' living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Equivalent to: REL 531

PHL 532. YOGA AND TANTRIC TRADITIONS. (4 Credits)
An examination of the theory and practice of yoga and tantra in the traditions of Hinduism, Buddhism, and Jainism, and in their contemporary popular manifestations. Emphasis on the representation of yoga and tantra in Indian literature and history, including contemplative practices, bodily disciplines, and ritual. CROSSLISTED as PHL 432/REL 432 and PHL 532/REL 532.
Equivalent to: REL 532

PHL 533. THEORY AND PRACTICE OF MODERN YOGA. (4 Credits)
An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga, Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSLISTED as PHL 433/REL 433 and PHL 533/REL 533.
Equivalent to: REL 533

PHL 534. SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534.
Equivalent to: REL 534

PHL 536. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: REL 536

Recommended: 6 credits of philosophy

PHL 539. PHILOSOPHY OF NATURE. (3 Credits)
Intensive one-week field course taught in the Cascade Range. What is nature? What is the relation of humans to the rest of the natural world? How are our concepts of nature and decisions about land use shaped by the words and metaphors we use? What is the value of wild places? What can we learn from a close study of the natural world about right ways of acting in communities, both civic and biotic? The course will draw on many ways of knowing—philosophical analysis, close observation, and especially writing. Camping required.

PHL 540. ENVIRONMENTAL ETHICS. (3 Credits)
Philosophical ideas about our ethical relationships with parts of the non-human world and future generations, with applications to current environmental issues. Includes a study of different conceptions of environmental ethics, philosophical problems in environmental ethics (such as the moral status of animals, plants, species, and ecosystems), the uses of environmental ethics by environmental groups, and selected contemporary global environmental issues such as global warming and loss of biodiversity.
Recommended: PHL 205 and PHL 342 and PHL 365 or 6 credits of philosophy

PHL 541. CLASSIC MORAL THEORIES. (3 Credits)
Philosophical issues in ethics analyzed through the examination of such classical works in moral philosophy as Aristotle's Nichomachean ethics. Not offered every year.
Recommended: Either PHL 205 or PHL 342 or PHL 440 or one course in the history of philosophy.

PHL 542. CONTEMPORARY MORAL THEORIES. (3 Credits)
Examines contemporary ethical theories through study of moral philosophy in the 20th century, including recent developments in such areas as environmental ethics and feminist/feminine ethics.
Recommended: At least two philosophy courses including at least one of PHL 205 or PHL 342 or PHL 541.

PHL 543. WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543.
Equivalent to: REL 543
Recommended: One introductory-level science course

PHL 544. BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544.
Equivalent to: REL 544

PHL 547. RESEARCH ETHICS. (3 Credits)
An examination of the interrelationship between ethical values and scientific practice. Topics include professionalism in science; scientific integrity, misconduct, and whistleblowing; the ethics of authorship; conflicts of interest between academic science and commercial science, and social responsibilities in science.

PHL 548. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548.
Equivalent to: ES 548, REL 548
PHL 550. TOPICS. (1-16 Credits) Uses the IDEAS MATTER lectures as the focus for an exploration of ideas that make a difference in the world. Students read background materials, attend lectures, meet with the speakers, and write essays on the ideas they learn.

This course is repeatable for 16 credits.

PHL 551. KNOWLEDGE AND REALITY. (3 Credits) Examination of significant theories of knowledge, theories concerning the nature of reality, and their connections. Includes an analysis of important concepts and problems, such as perception, induction, belief, empiricism, rationalism, and skepticism. Not offered every year.

Recommended: 6 credits of philosophy

PHL 555. DEATH AND DYING. (3 Credits) A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSLISTED as PHL 455/REL 455 and PHL 555/REL 555.

Equivalent to: REL 555

Recommended: 6 credits of philosophy

PHL 556. PHILOSOPHY OF MIND. (4 Credits) Past and present theories about consciousness, the relationship of mind and body, and the roots and implications of those theories. Includes historical 'isms' (e.g., dualism, monism), contemporary views, and connections of these theories to further issues in philosophy and contemporary culture, e.g., desires, mental illness, personhood and otherness, animal minds, explanation, the mind in non-Western traditions and in religions.

Recommended: PHL 251

PHL 561. ART AND MORALITY. (4 Credits) The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSLISTED as PHL 461/REL 461 and PHL 561/REL 561.

Equivalent to: REL 561

PHL 570. PHILOSOPHY OF SCIENCE. (3 Credits) Examination of philosophical questions, classic and contemporary, about science and scientific knowledge. Scientific explanations, the structure of theories, the concept of a natural law, revolutions in science, influences of the sciences and philosophy on one another, science and values. Not offered every year.

Recommended: 6 credits of upper-division philosophy

PHL 574. PHILOSOPHY OF BIOLOGY. (4 Credits) An introduction to some of the conceptual challenges engendered by contemporary evolutionary biology, including the nature of fitness, natural selection, adaptations, and species; identifying organisms, traits, and the units of selection; the evidence required to support particular adaptive or historical hypotheses; and others.

Recommended: Previous university-level course work in either philosophy or the biological sciences

PHL 599. TOPICS IN PHILOSOPHY. (1-4 Credits) Examination of the work of a philosopher or of a specific problem; e.g., Wittgenstein, determinism, perception. May be repeated for credit when topic varies. Not offered every year.

Equivalent to: PHL 590

This course is repeatable for 16 credits.

Recommended: 6 credits of upper-division philosophy

Physical Activity Courses (PAC)

PAC 100. ADAPTED PHYSICAL ACTIVITY. (1 Credit) Individual workout for students with permanent or temporary physical disabilities and for students enrolled in another PAC who sustain an injury.

This course is repeatable for 11 credits.

PAC 102. AQUA AEROBICS. (1 Credit) Fitness class using a variety of movements in shallow and deep water, mostly in a vertical position. Do not need swimming skills.

Equivalent to: PAC 101

This course is repeatable for 11 credits.

PAC 103. DEEP WATER FITNESS. (1 Credit) Fitness class using a variety of movements in a deep water pool, mostly in a vertical position. Should be comfortable in deep water.

This course is repeatable for 11 credits.

PAC 104. ARCHERY. (1 Credit) Basic mechanics and introduction to archery. Exposure to varying archery techniques and equipment, including recurve and compound bow shooting.

This course is repeatable for 11 credits.

PAC 105. CPR/FIRST AID. (1 Credit) Introduces cardiac and first aid emergency response procedures. Emphasis placed on safe response, chain of survival, quality CPR (adults, children, infants and team responses), use of an AED, medical emergencies, injury emergencies and environmental emergencies.

Students successfully completing the American Heart Association certification requirements will be issued a HeartSaver First Aid and BLS (Basic Life Support) for the Healthcare Provider certification at the end of the course.

This course is repeatable for 11 credits.

PAC 106. BEAVER FIT. (1 Credit) A conditioning class for those of all fitness levels that focuses on mobility, functional movement, and high-intensity interval training as a means to improve cardiovascular fitness, muscular fitness, and flexibility.

This course is repeatable for 11 credits.

PAC 108. STEP AEROBICS. (1 Credit) Low-impact, high intensity workout adjustable to all fitness levels utilizing adjustable height benches. Strengthening and flexibility exercises included.

This course is repeatable for 11 credits.

PAC 110. INTRODUCTION TO WHITE WATER KAYAKING. (2 Credits) Students will learn fundamentals of white water kayaking in sheltered water based on the internationally recognized British Canoe (BC) teaching and skills certification system. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course runs for six class sessions of 3 hours (Fridays), and one mandatory Saturday (5-hour) session. The entire class lasts for six weeks.

This course is repeatable for 11 credits.
PAC 111. INTRODUCTION TO CANOEING. (2 Credits)
Students will learn fundamentals of canoeing in sheltered water based on the internationally recognized British Canoe (BC) teaching and skills certification system. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course. This course runs for six class sessions of 3 hours (Fridays), and one mandatory Saturday (5-hour) session. The entire class lasts for six weeks.
This course is repeatable for 11 credits.

PAC 112. LEARNING KAYAK ROLLING BASICS. (2 Credits)
Students learn fundamentals of rolling a kayak in an indoor pool-based environment. Emphasis is on activity and basic skills. See class schedule for the location, website, and class schedule specific to the course.
This course is repeatable for 10 credits.

PAC 113. BADMINTON I. (1 Credit)
Singles and doubles skills, practice, rules, strategies and play.
This course is repeatable for 11 credits.

PAC 114. BADMINTON II. (1 Credit)
Intermediate skill development in badminton.
This course is repeatable for 11 credits.
Recommended: Fundamental skills, rules and strategy of singles and doubles play.

PAC 115. OUTDOOR LIVING SKILLS. (2 Credits)
Educates and introduces students on how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. Classroom and field (lab) experience. Includes one mandatory weekend overnight outing.
CROSSLISTED as PAC 115/TRAL 115.
Equivalent to: TRAL 115
This course is repeatable for 4 credits.

PAC 116. BASKETBALL I (MEN/WOMEN). (1 Credit)
Fundamental basketball skills, drills, rules, strategies, and practice. Game play appropriate for the skill level.
This course is repeatable for 11 credits.

PAC 117. BASKETBALL COMPETITIVE. (1 Credit)
Team play, individual and team skills developed and refined, competitive round robin tournaments.
This course is repeatable for 11 credits.
Recommended: Prior competitive experience.

PAC 118. LABORATORY FOR OUTDOOR LIVING SKILLS. (1 Credit)
Practical field application of concepts learned in PAC 115/TRAL 115, Outdoor Living Skills. Field (lab) experience includes one mandatory weekend overnight. Introduces how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. CROS BlISTED as PAC 118/TRAL 118.
Corequisites: PAC 115
Equivalent to: TRAL 118
This course is repeatable for 2 credits.

PAC 120. MOUNTAIN BIKING. (1 Credit)
Touring trails in Corvallis area; riding techniques, safety, maintenance, environmental concerns. Required equipment: mountain bike, tire repair kit, helmet.
This course is repeatable for 11 credits.

PAC 121. BILLIARDS. (1 Credit)
Skills, technique, strategy, game knowledge as introduction to billiards (pool), a 'cue' sport; rules and gaming for variations of pocket billiards; practice and class tournament play.
This course is repeatable for 11 credits.

PAC 122. BODY SCULPTING. (1 Credit)
Fitness workout set to music using lighter resistance training aids such as dumbbells, resistance tubing, bands, and aerobic steps.
This course is repeatable for 11 credits.

PAC 123. BOWLING I. (1 Credit)
Fundamentals of the game including etiquette, spot bowling, natural hook and straight ball delivery, scoring, handicap computation, spare pickup, and error correction. Additional fee; equipment supplied.
This course is repeatable for 11 credits.

PAC 124. BOWLING II. (1 Credit)
Review and refinement of basic fundamentals of bowling. Emphasis on spot bowling, adjusting for lane conditions, choices in equipment, league play, and mental training.
This course is repeatable for 11 credits.
Recommended: Bowling I or the ability to bowl above a 110 average.

PAC 126. CARDIO KICKBOXING I. (1 Credit)
High intensity group workout set to motivational music and combining skills and techniques from boxing, kickboxing, and other martial arts.
This course is repeatable for 11 credits.

PAC 129. CARDIO COMBO. (1 Credit)
Combination of aerobic training classes that use music such as Cardio Kickboxing, Body Sculpture, Sports Conditioning, and/or Step Aerobics. Actual curriculum may vary with instructors.
This course is repeatable for 11 credits.

PAC 130. CONDITIONING. (1 Credit)
Total body approach to fitness, cardiorespiratory conditioning, muscular strength and endurance; flexibility emphasized. May follow a specific training format, e.g., ROTC section follows Army conditioning format.
This course is repeatable for 11 credits.

PAC 131. SNOWBOARD-SKI CONDITIONING. (1 Credit)
Strength, muscular endurance, flexibility, balance, and cardiovascular exercises specific to downhill skiing and snowboarding; designed to help prepare students for participation in these sports.
This course is repeatable for 11 credits.

PAC 133. DANCE: TAP I. (1 Credit)
Individual and group dance with specialized shoes; basic step technique and vocabulary; warm up exercises progressing into rhythmic combinations performed to music; culminates in full routine to music.
This course is repeatable for 11 credits.

PAC 136. DANCE: BALLET I. (1 Credit)
Introduction to basic ballet technique and aesthetics, terminology, alignment, stretch and strength exercises. No previous dance experience needed. Additional fee for accompanist.
This course is repeatable for 11 credits.

PAC 137. DANCE: BALLET II. (1 Credit)
Review and practice of beginning ballet technique, introduction of more advanced stretches, steps, and combinations. Additional fee for accompanist.
This course is repeatable for 11 credits.
Recommended: Ballet I or previous ballet experience.
PAC 138. DANCE: BALLET III. (1 Credit)
Intermediate and advanced ballet technique, comprehensive exploration of the discipline. Additional fee for accompanist.
This course is repeatable for 11 credits.
Recommended: Ballet II, previous comparable experience

PAC 139. HIP HOP DANCE. (1 Credit)
Aerobic/energetic experience consisting of a warm-up/conditioning and choreographic combinations.
This course is repeatable for 11 credits.

PAC 140. DANCE: JAZZ I. (1 Credit)
Introduction to jazz dance, technique, isolations, and combinations. Different jazz styles are explored. No previous dance experience is necessary.
This course is repeatable for 11 credits.

PAC 141. DANCE: JAZZ II. (1 Credit)
Intermediate jazz technique, isolations and combinations.
Recommended: Jazz I or comparable experience.
This course is repeatable for 11 credits.

PAC 145. DANCE: MODERN I. (1 Credit)
Introduction to modern dance movement fundamentals. Technique, stretch, strength, and alignment are included, as well as an appreciation for movement expression. No previous dance experience needed. Additional fee for accompanist.
This course is repeatable for 11 credits.

PAC 146. DANCE: MODERN II. (1 Credit)
An intermediate level of modern dance technique and movement expression. Additional fee for accompanist.
This course is repeatable for 11 credits.
Recommended: Modern Dance I or comparable experience.

PAC 148. DANCE: CUBAN SALSA I (MEN/WOMEN). (1 Credit)
Foundations of Cuban Salsa (Casino) as well as Rueda de Casino with focus on musical development and fundamentals of leading and following in partner dance.
This course is repeatable for 11 credits.

PAC 149. DANCE: CUBAN SALSA II. (1 Credit)
Higher concepts of Cuban Salsa (Casino) as well as Rueda de Casino, with focus on musical development and fundamentals of leading and following in partner dance.
This course is repeatable for 11 credits.
Recommended: Cuban Salsa I or comparable experience.

PAC 150. CULTURAL WORLD DANCE (MEN/WOMEN). (1 Credit)
Introduction to traditional dance forms from Europe, Israel, North America and Asia, focusing on movement, cultural heritage, history, and diversity.
This course is repeatable for 11 credits.

PAC 151. COUNTRY LINE DANCE. (1 Credit)
Non-partner dance routines in country western style; musical interpretation, footwork, and sequencing of 20 different routines.
This course is repeatable for 11 credits.

PAC 152. DANCE: SALSA I. (1 Credit)
Steps and rhythmic accent of Salsa and Merengue style; fundamentals of leading and following, basic moves and combinations. No prior experience needed.
This course is repeatable for 11 credits.

PAC 153. DANCE: SALSA II. (1 Credit)
Intermediate moves, rhythmic accents and step combinations of Salsa; development of leading and following.
Prerequisites: PAC 152 with C- or better
This course is repeatable for 11 credits.

PAC 154. DANCE: COUNTRY WESTERN I (MEN/WOMEN). (1 Credit)
Focus on traditional Country Western dance patterns. Emphasizes fundamentals of leading and following. Also including introduction to waltz, two-step, cowboy cha-cha and 10-step polka.
Equivalent to: PAC 144
This course is repeatable for 11 credits.

PAC 155. DANCE: COUNTRY WESTERN II (MEN/WOMEN). (1 Credit)
Advanced two-step patterns and styling with a focus on musical interpretation; development of leading and following.
Prerequisites: PAC 155 with C- or better
This course is repeatable for 11 credits.

PAC 156. DANCE: COUNTRY WESTERN III (MEN/WOMEN). (1 Credit)
Focus on style, technique and many different step patterns of the western swing dance.
Recommended: Country Western I or comparable experience

PAC 157. DANCE: TANGO. (1 Credit)
Social dance focusing on Twenties-style Charleston, pure Balboa and Balboa-Swing, and Blues Dance.
This course is repeatable for 11 credits.

PAC 158. DANCE: BEGINNING SWING (MEN/WOMEN). (1 Credit)
Introduction to single time, double time, and triple time (jitterbug) swing; variations for each style, covering most swing music rhythms.
Emphasizes fundamentals of leading and following. Men/women.
This course is repeatable for 11 credits.

PAC 159. DANCE: BALLROOM I (MEN/WOMEN). (1 Credit)
Posture and alignment, fundamentals of leading and following, basic steps and variations for waltz, foxtrot, swing, tango, and cha-cha.
Equivalent to: PAC 134
This course is repeatable for 11 credits.

PAC 160. DANCE: BALLROOM II (MEN/WOMEN). (1 Credit)
Additional steps and patterns of popular ballroom dances.
Prerequisites: PAC 159 with C- or better
Equivalent to: PAC 135
This course is repeatable for 11 credits.

PAC 161. DANCE: BALLROOM III (MEN/WOMEN). (1 Credit)
Styling: additional dances: rhumba, silver fox trot, and Viennese waltz; advanced dance figures for tango and cha-cha.
Prerequisites: PAC 160 with C- or better
This course is repeatable for 11 credits.

PAC 162. DANCE: SWING II (MEN/WOMEN). (1 Credit)
Social dance focusing on Twenties-style Charleston, pure Balboa and Balboa-Swing, and Blues Dance.
This course is repeatable for 11 credits.

PAC 163. DANCE: LATIN I. (1 Credit)
Latin dances including cha-cha, mambo, salsa, rhumba, merengue, bolero, salsa, and paso doble. Emphasis on proper styling and technical execution of each dance; effective leading and following techniques.
Prerequisites: PAC 159 with C- or better
This course is repeatable for 11 credits.

PAC 165. DANCE: WEST COAST SWING (MEN/WOMEN). (1 Credit)
Focus on style, technique and many different step patterns of the west coast swing dance.
Prerequisites: PAC 154 with C- or better or PAC 159 with C- or better
Equivalent to: PAC 162
This course is repeatable for 11 credits.
PAC 166. BALLROOM 2 STEP, HUSTLE (MEN/WOMEN). (1 Credit)
Smooth, romantic social dance that is neither ballroom, Latin, nor swing
but a rhythm dance identified as club-style, danced to contemporary
ballad-like music. Hustle is fast-paced, swing-related dance to disco beat.
Class encompasses intermediate step patterns, technique and styling,
stationary, traveling patterns.
Prerequisites: PAC 160 with C- or better
This course is repeatable for 11 credits.

PAC 167. DANCE: Lindy Hop. (1 Credit)
Ballroom dance style based on original eight-count swing dance evolved
in Harlem ballrooms during the late 1920s; styling emphasized.
Prerequisites: PAC 158 with C- or better or PAC 159 with C- or better
This course is repeatable for 11 credits.

PAC 168. DANCE: LINDY HOP II (MEN/WOMEN). (1 Credit)
Intermediate patterns, syncopations, play techniques, and styling with a
focus on musical interpretation in the Lindy Hop style; development of
leading and following.
Prerequisites: PAC 167 with C- or better
This course is repeatable for 11 credits.

PAC 169. COOL SHOES, BALLROOM PERFORMANCE. (2 Credits)
Learn and perform ballroom dance routines on an intermediate level. This
course is a full year commitment ending with a dance concert in the
spring.
This course is repeatable for 12 credits.

PAC 170. DANCE: WEST COAST SWING II (MEN/WOMEN). (1 Credit)
Intermediate patterns, syncopations, play techniques, and styling with a
focus on musical interpretation; development of leading and following.
Prerequisites: PAC 165 with C- or better
This course is repeatable for 11 credits.

PAC 171. DANCE: NEW SHOES. (1 Credit)
IntroduceS students to formation ballroom dancing at a beginning level.
Dances learned over the course of this term will be determined by the
instructor at the beginning of the term.
Prerequisites: PAC 159 with D- or better
This course is repeatable for 11 credits.

PAC 173. INTERMEDIATE ROCK CLIMBING. (2 Credits)
Introduces variety of basic skills, gear and systems that will allow them to
safely participate in a single pitch rock climbing environment based on internationally recognized American Mountain Guides Association
(AMGA) teaching and skills certification systems. Presents students with
various technical skills that will serve as a foundation for future land-
based outdoor disciplines. Students will be introduced to gear, such as
software (ropes, webbing, harnesses) and hardware (carabiners, friction
deVICES); skills, such as knots, belaying, rappelling, lead climbing; and
systems such as anchors and basic rescue techniques. CROSSLISTED as
PAC 173/TRAL 173.
Equivalent to: TRAL 173
This course is repeatable for 10 credits.

PAC 174. FLAG FOOTBALL. (1 Credit)
Skill instruction and practice; drills; strategies, game play of America
football; emphasis on teamwork and sportsmanship in a competitive but
non-threatening or stressful environment.
This course is repeatable for 11 credits.

PAC 178. FLY FISHING I. (1 Credit)
Casting and fishing techniques, lure making, equipment selection,
terminology, and regulation for fishing in Oregon’s marine environment.
This course is repeatable for 11 credits.

PAC 179. FLY FISHING II. (1 Credit)
Advanced fly casting and fly fishing techniques for trout, fly-tying,
equipment selection, basic aquatic organism identification, terminology,
and regulations for fishing in Oregon's freshwater environment.
This course is repeatable for 11 credits.

PAC 180. STEELHEAD FISHING. (1 Credit)
Casting and fishing techniques, lure making, equipment selection,
terminology, and regulations for fishing in Oregon's marine environment
for steelhead.
This course is repeatable for 11 credits.

PAC 181. DISC GOLF I. (1 Credit)
Techniques for throwing discs; equipment, knowledge, etiquette, and
rules associated with playing a disc golf course; experience playing
practice and official disc golf courses.
This course is repeatable for 11 credits.

PAC 182. DISC GOLF II. (1 Credit)
Basic fundamental principles in all phases of golf; rules, terminology,
etiquette, safety and scoring. Equipment provided.
This course is repeatable for 11 credits.

PAC 183. GOLF III. (1 Credit)
Advanced skills, knowledge involved in competitive play. Course play
expected, additional fee.
This course is repeatable for 11 credits.
Recommended: Golf I

PAC 184. GOLF I. (1 Credit)
Basic level grappling self-defense techniques and applying them in
sparring sessions along with understanding the core principles which
make this martial arts system effective. An introduction to the history
of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and
culture.
This course is repeatable for 11 credits.

PAC 185. GOLF I. (1 Credit)
Basic fundamental principles in all phases of golf; rules, terminology,
etiquette, safety and scoring. Equipment provided.
This course is repeatable for 11 credits.
Recommended: Handicap below 15 or Golf II; competitive play.

PAC 186. GOLF II. (1 Credit)
Individual practice and course play; skill refinement as continuation of
Golf I. Equipment available. Course play expected, additional fee.
This course is repeatable for 11 credits.
Recommended: Handicap below 15 or Golf II; competitive play.

PAC 187. GYMNASIUM. (1 Credit)
Basic fundamental principles in all phases of golf; rules, terminology,
etiquette, safety and scoring. Equipment provided.
This course is repeatable for 11 credits.

PAC 188. GYMNASIUMS. (1 Credit)
Basic fundamental principles in all phases of golf; rules, terminology,
etiquette, safety and scoring. Equipment provided.
This course is repeatable for 11 credits.

PAC 189. GYMNASIUMS II. (1 Credit)
Basic level grappling self-defense techniques and applying them in
sparring sessions along with understanding the core principles which
make this martial arts system effective. An introduction to the history
of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and
culture.
This course is repeatable for 11 credits.

PAC 190. KARATE. (1 Credit)
Basic level grappling self-defense techniques and applying them in
sparring sessions along with understanding the core principles which
make this martial arts system effective. An introduction to the history
of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and
culture.
This course is repeatable for 11 credits.

PAC 191. BRAZILIAN JIU-JITSU. (1 Credit)
Basic level grappling self-defense techniques and applying them in
sparring sessions along with understanding the core principles which
make this martial arts system effective. An introduction to the history
of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and
culture.
This course is repeatable for 11 credits.

PAC 192. JUDO I. (1 Credit)
Basic level grappling self-defense techniques and applying them in
sparring sessions along with understanding the core principles which
make this martial arts system effective. An introduction to the history
of Brazilian Jiu-jitsu along with proper gym etiquette, vocabulary, and
culture.
This course is repeatable for 11 credits.
PAC 193. JUDO II. (1 Credit)
Intermediate skill instruction in landing, throwing, pins, chokes in Kodokan Judo style; principles of Seiryoku-Zenyou and Jita-Kyouei designed to help individuals become better members of society through training body and mind; instruction for competition knowledge and skills. Judo etiquette for practice and competition expected.  
This course is repeatable for 11 credits.  
Recommended: Judo I or comparable experience

PAC 194. PILATES. (1 Credit)
Non-impact, invigorating approach to physical conditioning and mind/ body awareness; helps develop core body strength, improve posture and balance, and increase muscle endurance, tone, flexibility.  
This course is repeatable for 11 credits.

PAC 195. PILATES II. (1 Credit)
Progression of Joseph Pilates mat exercises; emphasis on intermediate and advanced levels; application of Pilates’ principles to new exercises; use of props; application of principles to daily living.  
This course is repeatable for 11 credits.  
Recommended: PAC 194, Pilates.

PAC 197. PICKLEBALL. (1 Credit)
Fast-paced, self-officiated net game with similarities to tennis, badminton, table tennis, and racquetball. Course covers rules, strategies, technique, preparation for play, and includes extensive active practice and play; played with two, three, or four people.  
This course is repeatable for 11 credits.

PAC 199. SPECIAL TOPICS. (1-3 Credits)
Experimental or new classes.  
This course is repeatable for 11 credits.

PAC 201. RELAXATION. (1 Credit)
Introduction to techniques that promote relaxation of the nervous system. These may include, but are not limited to: meditation, imagery, yoga postures, and self-massage. Students will be encouraged to reflect on how life choices influence their nervous system.  
This course is repeatable for 11 credits.

PAC 202. MEDITATION. (1 Credit)
Examine the application of building simple awareness, how to manage thoughts in productive and compassionate ways, and how to transfer these skills into healthy relationships. Explore strategies for managing mental and physical difficulties including anxiety, pain, and overall stress through experiential learning and personal sharing of experiences.  
This course is repeatable for 11 credits.

PAC 203. OBSERVATION & ASSISTANT INSTRUCTIONAL PRACTICE IN PHYS ACT. (1 Credit)
Observe and begin physical activity instruction within dance, yoga, sports, fitness, aquatics, martial arts, or cross-disciplinary physical activities. Used in several of the leadership training program curriculums.  
This course is repeatable for 11 credits.

PAC 204. LEAD INSTRUCTIONAL PRACTICE IN PHYSICAL ACTIVITY. (1 Credit)
Lead physical activity curriculum within dance, yoga, fitness, aquatics, sports, martial arts, or cross-disciplinary physical activities. Gain experience implementing already designed lesson plans, assessment, and leading peers through basic exercise, while supervised by university and program personnel.  
Prerequisites: PAC 203 with C- or better  
This course is repeatable for 11 credits.

PAC 205. ROWING, CREW I (MEN/WOMEN). (1 Credit)
Introduction to the sport of rowing; designed for the novice (beginner). Includes basic technique and terminology, related water safety, and development of strength, endurance, and flexibility.  
This course is repeatable for 11 credits.  
Recommended: Swim Test (1).

PAC 208. WORKSHOP . (1-16 Credits)
This course is repeatable for 16 credits.

PAC 212. RUNNING, JOGGING. (1 Credit)
Cardiorespiratory fitness with scenic running routes; training, nutrition, and physiology. Beginning and intermediate level.  
This course is repeatable for 11 credits.

PAC 213. RUNNING: 10K TRAINING. (1 Credit)
Intermediate to advanced conditioning and training program for road racing.  
This course is repeatable for 11 credits.  
Recommended: Prior training in running.

PAC 214. HALF MARATHON TRAINING. (2 Credits)
Progressive training combining walking, running, core strengthening, interval techniques in preparation for a 13.1 mile (1/2 marathon) event. Open to all levels; may choose to walk, walk/run, or run.  
This course is repeatable for 11 credits.

PAC 215. RUGBY, TOUCH. (1 Credit)
Basic skills of open field rugby; emphasis on ball handling and attacking strategy; rules and history; game play.  
This course is repeatable for 11 credits.

PAC 217. SELF DEFENSE. (1 Credit)
Nonviolent self-defense. Develop self-confidence and skills for assault situations. Conditioning and practical skills. Men and women, all levels.  
This course is repeatable for 11 credits.

PAC 224. TELEMARK SKIING. (1 Credit)
Winter sport that is a cross between cross country and downhill skiing. Requires telemark equipment where the heel is unattached. Class accommodates all levels and practices on the downhill slopes. Additional fee covers bus transportation, lessons, and lift ticket. Rental of equipment is not included.  
This course is repeatable for 11 credits.

PAC 225. DOWNHILL SKIING. (1 Credit)
Travel to area facilities, 1-1/2 hour lesson followed by open practice, students grouped according to skill level: beginner, intermediate, advanced, racer. Special fee covers bus transportation, lessons, and lifts. Additional fee for rentals.  
This course is repeatable for 11 credits.

PAC 227. SNOWBOARDING. (1 Credit)
Travel to area facilities, 1 1/2 hour lesson followed by open practice, students grouped according to skill level: beginner, intermediate, advanced. Special fee covers bus transportation, lessons, and lifts. Additional fee for rentals.  
This course is repeatable for 11 credits.

PAC 229. SOCCER I. (1 Credit)
Basic skills of controlling the ball; conditioning; lead-up games; team play.  
Equivalent to: PAC 211  
This course is repeatable for 11 credits.
PAC 230. SOCCER II. (1 Credit)
Review of basic skills of offense and defense in controlled game play; concepts of team position and play, pressure and attack.
This course is repeatable for 11 credits.
Recommended: Previous soccer experience.

PAC 231. SOCCER III. (1 Credit)
High level soccer skills; team play and transition concepts; set plays and alignments for both offense and defense.
This course is repeatable for 11 credits.
Recommended: Soccer II or competitive playing experience.

PAC 233. SOCCER: INDOOR. (1 Credit)
Skill instruction and development; strategies and rules for indoor play; game play in indoor gymnasium.
This course is repeatable for 11 credits.

PAC 236. SOFTBALL, WHIFFLEBALL. (1 Credit)
Skills, rules, strategies, practice, and game play of the popular outdoor slow pitch game. Modified softball with whiffleball when play is indoors.
This course is repeatable for 11 credits.

PAC 242. SCUBA: OPEN WATER. (2 Credits)
Lecture includes physiology, water environment, equipment, and techniques for fundamental SCUBA diving. Laboratory includes practice in techniques, skills, and equipment usage; sessions held in pool and open water. Successful completion leads to PADI certification. Additional fee covers most equipment, texts, certification, and open water dive trip.
This course is repeatable for 11 credits.
Recommended: 200-yard swim, 10-minute survival skills and good health.

PAC 243. SCUBA: ADVANCED OPEN WATER. (1 Credit)
Classroom lecture and laboratory in hypothermics, natural navigation, dive physiology, compass navigation, night and limited visibility procedures, boat diving, search and salvage techniques, deep diving procedures, health for diving, and an introduction to dive rescue. Successful completion of this course can lead to PADI certification.
Additional fee.
Equivalent to: PAC 228
This course is repeatable for 11 credits.
Recommended: PAC 242 or PADI Open Water Certification

PAC 244. SCUBA: RESCUE DIVER. (1 Credit)
Techniques, skills, knowledge, and practice in self-rescue and rescue of others in underwater emergencies; may lead to PADI certification; lecture and pool laboratory; open water dive required. Additional fee.
This course is repeatable for 11 credits.
Recommended: PAC 243 or PADI Advanced Open Water Certification

PAC 245. SCUBA SPECIAL TOPICS. (1 Credit)
Specialized courses requiring previous certification in SCUBA. Check the current schedule of classes for more information and prerequisites. Possible classes: altitude diver, night diver, search and recovery, deep diver, underwater navigation, equipment specialist. Additional fee.
This course is repeatable for 11 credits.
Recommended: PAC 242 or PADI Open Water Certification

PAC 246. DIVEMASTER TRAINING. (2 Credits)
Enter level PADI certification course for preparation to instruct SCUBA; lecture, lab, open water experience; must take two consecutive terms.
This course is repeatable for 11 credits.
Recommended: PAC 244. PADI Advanced, Advanced Plus, Rescue Diver certifications and 20 logged dives

PAC 247. SURFING. (1 Credit)
Knowledge and fundamental skills of this aquatic sport including history, terminology, safety precautions, the ocean environment, and equipment. Additional fee.
This course is repeatable for 11 credits.

PAC 248. SWIM: NON-SWIMMER. (1 Credit)
Skills for self-rescue; fundamental skills in swimming and safety. Designed for people with a fear of water. Recommended S/U grading.
Equivalent to: PAC 219
This course is repeatable for 11 credits.

PAC 249. LIFEGUARD TRAINING. (1 Credit)
Trains participants in the skills required to become a lifeguard. Emphasis on professional behavior, water rescues, safe response, quality CPR (adults, children, infants, and team responses), use of an AED and first aid. Students successfully completing the American Red Cross certification requirements will be issued a lifeguarding certification at the end of the course.
This course is repeatable for 11 credits.
Recommended: Basic swimming skills

PAC 250. SWIM I. (1 Credit)
Swimming concepts, survival and breathing techniques, front crawl and elementary backstroke as minimum instruction.
This course is repeatable for 11 credits.
Recommended: Swim I or the ability to front crawl continuously for 75 yards

PAC 252. SWIM II. (1 Credit)
Fitness swimming, swimming strokes and skills.
Equivalent to: PAC 221
This course is repeatable for 11 credits.
Recommended: PAC 250. SWIM I

PAC 253. SWIM TRAINING WORKOUT. (1 Credit)
Competitive skills and strokes; emphasis on training.
This course is repeatable for 11 credits.
Recommended: Ability to do interval training.

PAC 254. COMPETITIVE SWIMMING. (1 Credit)
Prepares students for competitive swimming and emphasizes lifetime aquatic fitness; interval swim workouts designed for speed and endurance; instruction on legal techniques of strokes and turns; culminates in intra-class swim meet; 2,000-3,000 yards/day.
This course is repeatable for 11 credits.
Recommended: Swim II or previous interval training experience up to 400 yard distances

PAC 256. TAIJI, TAI CHI I. (1 Credit)
Introduction to ancient Chinese ‘internal martial art’ based upon concepts of Yin and Yang; detailed slow and relaxed form movements provide benefits to body, mind, and spirit.
This course is repeatable for 11 credits.

PAC 257. TAIJI, TAI CHI II. (1 Credit)
Continuation of study of the Yang-style Taiji form; more in-depth exploration of underlying principles and push-hands exercises.
This course is repeatable for 11 credits.

PAC 260. TENNIS I. (1 Credit)
Introduction to fundamental strokes, singles and doubles play, scoring, and basic concepts in tennis.
Equivalent to: PAC 234
This course is repeatable for 11 credits.
PAC 261. TENNIS II. (1 Credit)
Review and refinement of fundamental strokes; volley, lob, return of serve; introduction to singles and doubles strategy.
Equivalent to: PAC 235
This course is repeatable for 11 credits.
Recommended: Tennis I or competitive tennis experience

PAC 262. TENNIS III. (1 Credit)
Focus on ground stroke, serve consistency; approach shots and overheads; tactics for net and baseline play.
This course is repeatable for 11 credits.
Recommended: Tennis II

PAC 264. TEAM HANDBALL/(MEN/WOMEN). (1 Credit)
Fast-paced indoor court game that combines skills and strategies similar to water polo, basketball, soccer and hockey; rules, regulations, strategies, and skills introduced and practiced; requires teamwork, cooperation, and court strategy.
This course is repeatable for 11 credits.

PAC 265. TUMBLING I. (1 Credit)
Technical instruction, progressions, and practice in basic, intermediate, and advanced tumbling skills; emphasis on safety and fitness concepts; floor and mini-trampoline skills; no apparatus instruction.
This course is repeatable for 11 credits.
Recommended: Tumbling I or prior experience.

PAC 266. TUMBLING II. (1 Credit)
Technical instruction, progressions, safety, and practice building upon skills taught in PAC 265, Tumbling I.
This course is repeatable for 11 credits.

PAC 268. TRIATHLON TRAINING. (2 Credits)
Training in swimming, running, and bicycling to prepare for triathlon participation. Strategies, transitioning technique, and weight training information; training plan formation; event planning; culminates in class or community event.
This course is repeatable for 11 credits.
Recommended: Experience in at least one of the three activities.

PAC 271. ULTIMATE FRISBEE. (1 Credit)
Fundamentals for the beginning and intermediate player; individual skill development, rules, game play, and strategy.
This course is repeatable for 11 credits.

PAC 273. VOLLEYBALL I. (1 Credit)
Fundamental volleyball skills, drills, rules, strategies, and practice. Game play appropriate for skill level.
This course is repeatable for 11 credits.

PAC 274. VOLLEYBALL II. (1 Credit)
Fundamental skills and knowledge refined; intermediate skills developed, competitive play.
This course is repeatable for 11 credits.
Recommended: Volleyball I and good fundamental skills.

PAC 275. VOLLEYBALL III. (1 Credit)
Skill refinement and development; intense, highly competitive drills and game situations, doubles through sixes play.
This course is repeatable for 11 credits.
Recommended: Volleyball II or varsity-level experience

PAC 278. FITNESS WALKING. (1 Credit)
Establishment of personal fitness programs through walking with emphasis on technique and aerobic components.
This course is repeatable for 11 credits.

PAC 282. WATER POLO. (1 Credit)
Team game, played in deep water; instruction in skills, drills, strategies, techniques; game play; knowledge of rules and terminology.
This course is repeatable for 11 credits.
Recommended: Swim I skills.

PAC 286. WEIGHT TRAINING: CIRCUITS. (1 Credit)
Fast-paced fitness class using stations of resistance training exercises. Designed to improve cardiovascular fitness and muscular endurance more than strength.
This course is repeatable for 11 credits.

PAC 287. WEIGHT TRAINING I. (1 Credit)
Exercise techniques in both free and fixed resistance training equipment; safety procedures, terminology, and principles of exercise.
This course is repeatable for 11 credits.

PAC 288. WEIGHT TRAINING II. (1 Credit)
Intermediate level of weight training in free and fixed weights.
Prerequisites: PAC 287 with C+ or better
This course is repeatable for 11 credits.

PAC 292. WRESTLING. (1 Credit)
Collegiate wrestling fall and winter terms; freestyle and Greco wrestling spring term. All levels.
This course is repeatable for 11 credits.

PAC 293. INTERDISCIPLINARY YOGA. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Equivalent to: PAC 293H
This course is repeatable for 11 credits.

PAC 293H. INTERDISCIPLINARY YOGA. (1 Credit)
Basic yoga poses (asanas) using specific techniques and sequences to promote flexibility, strength, relaxation, and a sense of well-being will be used. Integrative concepts between yoga and our daily life will be examined as well as yoga in relationship to other forms of physical movement.
Attributes: HNRS – Honors Course Designator
Equivalent to: PAC 293
This course is repeatable for 11 credits.

PAC 294. YOGA I. (1 Credit)
Principles and practice of basic yoga postures, techniques of posture alignment, yogi breathing styles and their impact on the body and mind. Students will be exposed to a variety of forms of yoga, as well as basic yoga philosophy.
This course is repeatable for 11 credits.

PAC 295. YOGA II. (1 Credit)
Building off Yoga I, this is an intermediate level course meant to develop a deeper understanding of yoga practice.
Equivalent to: PAC 256
This course is repeatable for 11 credits.
Recommended: Yoga I or previous yoga experience.

PAC 296. VINYASA YOGA. (1 Credit)
Dynamic flow that connects movement and breath encouraging meditation in motion. May include sustained yoga postures.
Equivalent to: PAC 257
This course is repeatable for 11 credits.
Recommended: Yoga I or previous yoga experience.
PAC 297. YOGATHON. (1 Credit)
Expands on knowledge and skills learned in Yoga I or Fitness Yoga through three to five class sessions, each 3-6 hours; longer sessions provide students with an intensive mental and physical experience centering on the concepts of yoga; includes introductory relaxation and meditation skills.
This course is repeatable for 11 credits.
Recommended: PAC 294 and PAC 295 and PAC 296 and (Yoga I or Fitness Yoga)

PAC 298. RESTORATIVE YOGA. (1 Credit)
An emphasis on floor postures, supported postures, and longer holds that cultivate a relationship with ease. Techniques will be used to help students facilitate greater personal awareness. Students will use self reflection practices for personal well-being.
This course is repeatable for 11 credits.

PAC 299. SPECIAL TOPICS. (1-3 Credits)
Advanced information, skills, practice, and application; experimental and new classes. May have additional fee.
This course is repeatable for 11 credits.
Recommended: Intermediate to advanced skills in an activity area

PAC 300. ALI: HIKING LOCAL TRAILS. (1 Credit)
Covers the fundamentals of hiking as a recreational activity and an outdoor travel skill. Content will cover local trails, place history, hiking techniques, clothing and equipment selection, elemental first aid and safety concerns, leave-no-trace principles, and map basics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 301. ALI: CHALLENGE COURSE EXPERIENCE. (1 Credit)
Emphasis on gaining practical experience and understanding of various components that occur in challenge course activities/programs; group dynamic mental and physical challenges; cooperative games and initiatives that promote communication, problem solving skills and leadership; Low and High challenge course activities that promote self-confidence and agility. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 302. ALI: CHALLENGE COURSE PRACTICES AND FACILITATION. (1 Credit)
Covers the set up and facilitation of various challenge course low and high course elements as they pertain to ALI's Challenge Course programming. Students will learn facilitation skills, risk management concepts, operational procedures, and technical rescue skills. A passing grade in this course will result in a certificate of completion from the OSU ALI Challenge Course. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 301 with C- or better
This course is repeatable for 11 credits.
Recommended: Climbing wall instructor, efficient climbers toolbox, self-rescue

PAC 303. ALI: CAMP CRAFT. (1 Credit)
Provides basic front-country camping skills such as packing, trip planning, how to dress for different climates/weather, storm-proofing, knife and axe techniques and safety, stove and kitchen operations, and fire building. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 304. ALI: BACKPACKING. (1 Credit)
Hiking and camping while carrying all gear; tent set-up, camp site selection, operation of single-burner stoves, loading a backpack, water infiltration, navigation, proper hiking technique, energy conservation; leave-no-trace principles in every aspect of the trip and class; includes classroom instruction and required overnight trip. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 307. ALI: RAFTING. (1 Credit)
An introduction to white water rafting. Students will learn the fundamentals of safe rafting, trip planning and become familiar with the gear associated with rafting. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 308. ALI: CANOEING. (1 Credit)
Designed as an introduction to canoeing. Students learn the fundamentals of safe canoeing, trip planning and become familiar with the gear associated with rafting. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 309. ALI: KAYAKING I. (1 Credit)
Focuses on developing technical kayaking skills in flat water and moving water up to Class I. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 311. ALI: STAND UP PADDLEBOARD. (1 Credit)
Covers the curriculum for level 1 and 2 American Canoe Association standup paddle board skills courses. Skills include equipment, environmental factors, techniques, preparation and planning, emergency management, and environmental ethics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 313. ALI: CANYONEERING. (1 Credit)
Students will learn the fundamentals of canyoneering, including efficient hiking techniques, safe anchoring, belaying and rappelling techniques, and environmental mitigation skills. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 314. ALI: BOULDERING. (1 Credit)
Introduction to the sport of bouldering, a subset of rock climbing using an indoor climbing facility; emphasis on safety, spotting, climbing movement, training techniques and improvement; provides activities that promote muscular strength and endurance, flexibility, and cardiovascular endurance. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 315. ALI: ROCK CLIMBING I. (1 Credit)
Physical conditioning for, and instruction in, the skills and techniques of rock climbing; environmental impact issues; held at on-campus indoor climbing center. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 316. ALI: ROCK CLIMBING II. (1 Credit)
Focuses on developing technical climbing skills related to lead climbing and anchor construction. Includes a one-day outdoor experience. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 315 with C- or better
This course is repeatable for 11 credits.
PAC 317. ALI: ROCK CLIMBING III. (1 Credit)
Focuses on developing technical climbing skills in an outdoor setting. Includes a weekend long outdoor experience and cover skills ranging from building anchors using natural protection, to advanced outdoor movement skills. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 315 with C- or better and PAC 316 [C-]
This course is repeatable for 11 credits.
Recommended: Intermediate to advanced skills in an activity area

PAC 319. ALI: TECHNICAL RAPPELLING. (1 Credit)
Students will learn, practice and hone their skills in the art of technical rappelling. Introduces many different styles, techniques and equipment used for rappelling in a variety of situations. Throughout the course, students will be provided with simple to advanced challenges to overcome. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 320. ALI: MOUNTAINEERING I. (1 Credit)
Snow climbing techniques, anchoring, belaying and rappelling techniques, snow camping/living skills, and wilderness ethics; classroom instruction and required overnight alpine trip. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 321. ALI: MOUNTAINEERING II. (1 Credit)
Building on skills learned in Mountaineering I; rope team/glacier travel experience, fundamentals of crevasse rescue, advanced snow climbing techniques, safe anchoring, belaying and rappelling techniques, snow camping/living skills, and wilderness ethics. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 320 with C- or better
This course is repeatable for 11 credits.

PAC 322. ALI: ICE CLIMBING. (1 Credit)
Students will learn the fundamentals of ice climbing, including efficient ice climbing techniques, safe anchoring, belaying and rappelling techniques and wilderness ethics. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 323. ALI: MOUNTAIN RESCUE BASICS. (1 Credit)
Focuses on developing technical skills in a mountain rescue system. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 320 with D- or better
This course is repeatable for 11 credits.

PAC 324. ALI: WHITE WATER RESCUE. (1 Credit)
Provides an introduction to white water rescue; students learn the fundamentals of white water rescue, scene management, and the necessary gear to perform rescues. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 325. ALI: WILDERNESS FIRST AID. (1 Credit)
Fundamentals of emergency care in a non-urban environment including anatomy, physiology, injury assessment, short-term care, small-group rescues; backcountry emphasis with long-term care and evacuation complications. PAC courses may not be used to fulfill upper-division requirements.
Equivalent to: PAC 325H
This course is repeatable for 11 credits.

PAC 326. ALI: BUSH CRAFT. (1 Credit)
Basic wilderness living techniques, knowledge and skills needed for a student to be ethical and efficient, and have the ability to survive in the outdoors. Special emphasis is placed on building shelters, water purification, navigation, awareness, fire, self-sufficiency and caring for groups in the wilderness. PAC courses may not be used to fulfill upper-division requirements.
Prerequisites: PAC 303 with D- or better
This course is repeatable for 11 credits.

PAC 327. ALI: ROCK GUIDE SCHOOL. (1 Credit)
Serves as an opportunity to learn the skills for being a rock guide for the ALI. With five days of training and practice in the field at two climbing sites in Oregon, it serves to help students understand the unique challenges of instructing climbing in the outdoor environment. This course may end with Sport Climbing Instructor certification through the Professional Climbing Instructors of America. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.
Recommended: Efficient climbers toolbox, self-rescue, climbing wall instructor--lead certification

PAC 328. ALI: RAFT GUIDE SCHOOL. (1 Credit)
Provides students the skills and guided practice time needed to become competent paddle raft guides. It is a nine-day course that focuses on the development of water reading, raft maneuvering, risk management, and whitewater rescue skills needed by raft guides. Successful completion of the course will result in a certificate of completion from the American Canoe Association (ACA). PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 329. ALI: WILDERNESS FIRST RESPONDER. (2 Credits)
Fundamentals of emergency care in a non-urban environment, including physiology, injury assessment, short-term care, anatomy, and small-group rescues. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

PAC 330. ALI: SNOW TRAVEL AND CAMPING. (1 Credit)
An introduction to traveling in the backcountry in adverse weather conditions that often accompany winter. Topics covered include cross country touring, snow shoeing, winter camping techniques, and winter safety considerations including introducing avalanche safety. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.
PAC 331. THE ART OF FLY FISHING. (1 Credit)
Students will be introduced to fly fishing skills such as casting, knot tying, safety considerations, fly selection, and ways to approach water. There will be a general overview of common places and species to fish in Oregon and other locations. This course combines approximately 30 hours of instruction, online activities, and assignments for 1 credit. PAC courses may not be used to fulfill upper-division requirements.
Corequisites: ENG 225, FW 112
This course is repeatable for 11 credits.

PAC 332. AI: AVALANCHE AWARENESS. (1 Credit)
Focuses on what causes avalanches, how to safely travel in avalanche terrain, and resources to pursue in understanding the avalanche risk where you are traveling. PAC courses may not be used to fulfill upper-division requirements.
This course is repeatable for 11 credits.

Physical Therapy/Therapist (PT)

PT 700. PROFESSIONALISM AND INTERPROFESSIONAL PRACTICE. (2 Credits)
Introduction to the role of the professional in physical therapy practice. Topics of application include communication, professional behavior and abilities, ethics, legal issues, and responsibility for professional development.

PT 711. ANALYTICAL ANATOMY AND IMAGING. (4 Credits)
Detailed kinesiologic analysis of appendicular, spine, head, neck, and face muscles. Lecture, clinical demonstration, and practical experiences.

PT 712. NEUROANATOMY AND NEUROSCIENCE. (5 Credits)
Organized approach to structures in the brain, spinal cord and peripheral nervous systems. Detailed analysis of Neurophysiologic mechanisms underlying normal and abnormal motor sensory function.

PT 713. MUSCULOSKELETAL ANATOMY. (6 Credits)
Musculoskeletal anatomy, innervation, blood supply, and function: intensive study of the head, neck, trunk, and limbs.

PT 716. CULTURAL COMPETENCE IN PHYSICAL THERAPY. (2 Credits)
An exploration of how cultural competence is a critical core component of professional practice in physical therapy and should be considered as a part of the best practice in providing physical therapy care.

PT 717. GERIATRICS IN PHYSICAL THERAPY. (2 Credits)
An overview of the Physical and Psycho-Behavior aspects of aging in adulthood. An introduction to usual and pathological changes and treatment issues relevant to older patients.

PT 718. PSYCHOSOCIAL ASPECTS OF DISABILITY. (2 Credits)
A study of behavior, social structures and beliefs, and interaction patterns to support the scientific basis of the effective interactions of physical therapists with patients.

PT 719. PHYSICAL THERAPY IN RURAL COMMUNITIES. (2 Credits)
An overview of major issues in the rural health care system and the environment in which physical therapists, as rural health clinicians, must function. Provides students with an understanding of the healthcare delivery system in rural America with a concentration on the diverse populations of the Northwest region of the United States.

PT 720. MOTOR DEVELOPMENT. (3 Credits)
Examination of normal development of gross motor, fine motor, language, cognition, psychosocial, and play skills across the lifespan from in utero to young adulthood.

PT 721. MOTOR CONTROL AND LEARNING ACROSS THE LIFE SPAN. (4 Credits)
Introduction to sensorimotor systems, overview of current perspectives in motor control and learning from fetus through late adulthood, and clinical tests of motor proficiency.

PT 722. PREVENTION WELLNESS AND POPULATION HEALTH. (3 Credits)
A study of the development of wellness plans for individuals or families in the community. Students will learn to assess family health care needs, seek out community resources, and educate community members on specific issues related to their own health and well-being.

PT 730. APPLIED PHYSIOLOGY. (3 Credits)
Selected subjects in cellular and systems physiology. Emphasis on molecular and cellular aspects of neuromuscular function, also renal and endocrine physiology.

PT 731. CLINICAL EXERCISE PHYSIOLOGY. (4 Credits)
Adaptation of the human body to exercise and the use of exercise to modify human function.

PT 740. THERAPEUTIC EXERCISE I. (3 Credits)
Theoretical principles for evaluation of exercise need and prescription of exercise programs. Emphasis on approaches for patients with musculoskeletal deficits.

PT 741. THERAPEUTIC EXERCISE II. (3 Credits)
Examination of needs analysis and prescription of exercise programs for special patient populations and assessment of current community trends in exercise and wellness.

PT 743. BUSINESS AND ADMINISTRATION IN PHYSICAL THERAPY. (3 Credits)
Examination on the factors affecting patients entry into and progression through the healthcare system, including the effect of current financial, legal and regulatory policies that affect the patient, the patient/professional relationship, and the practice of physical therapy. Provides an overview of primary business disciplines including market research and strategy, marketing, finance, operations, and management.

PT 745. BASICS OF PATIENT MANAGEMENT. (1,6 Credits)
Development of basic decision-making skills, professional behaviors and impairment assessment in patients with musculoskeletal, neurologic and/or cardiopulmonary dysfunction.
This course is repeatable for 6 credits.

PT 746. DISORDERS OF THE MUSCULOSKELETAL SYSTEM. (3 Credits)
Regional description of pathology and pathophysiological mechanisms of disorders of bone, connective tissue, and joints.

PT 748. THERAPEUTIC MODALITIES. (3 Credits)
An introduction to the management of pain and dysfunction using thermal, electrical and mechanical modalities used by Physical Therapists in general practice.

PT 750. CLINICAL BIOMECHANICS & GAIT. (5 Credits)
Introduction to the principles of biomechanics as they apply to physical therapy practice. Emphasis on joint structure and function and tissue mechanics. Introduction to both normal and pathological gait including examination of joint kinematics, kinetics, and muscle activity.

PT 752. PROSTHETICS AND ORTHOTICS. (3 Credits)
The examination of pathological gait of patients using prosthetic and orthotic devices. The course emphasizes types of orthotic and prosthetic devices, assessments, reassessment and corrections of gait deviations using therapeutic interventions geared toward functional interventions, patient/family education, exercises, and balance and coordination techniques.
PT 760. PHARMACOLOGY. (2 Credits)
The study of prescription and/or over-the-counter medications used in
the management of a variety of patient conditions encountered during
physical therapy management.

PT 761. RESEARCH METHODS AND EVIDENCE BASED PRACTICE. (2 Credits)
Introduction to evidence based practice, scientific methods, and clinical
research methodologies.

PT 780. DIFFERENTIAL DIAGNOSIS. (4 Credits)
Consideration of principles of differential diagnosis with emphasis on
mastering this skill.

PT 791. MANAGEMENT OF CARDIOPULMONARY DYSFUNCTION. (2 Credits)
Physical therapy evaluation and intervention in the care of patients with
circulatory, cardiac, or pulmonary dysfunction.

Physics (PH)

PH 104. *DESCRIPTIVE ASTRONOMY. (4 Credits)
Historical and cultural context of discoveries concerning planets
and stars and their motions. Topics include the solar system, the
constellations, birth and death of stars, pulsars and black holes. An
accompanying laboratory is used for demonstrations, experiments, and
projects, as well as for outdoor observations. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 104H

PH 104H. *DESCRIPTIVE ASTRONOMY. (4 Credits)
Historical and cultural context of discoveries concerning planets
and stars and their motions. Topics include the solar system, the
constellations, birth and death of stars, pulsars and black holes. An
accompanying laboratory is used for demonstrations, experiments, and
projects, as well as for outdoor observations. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course
Equivalent to: PH 104

PH 106. *PERSPECTIVES IN PHYSICS. (4 Credits)
A descriptive and non-mathematical study of the development of physical
concepts and their historical and philosophical context. The emphasis
is on the origin, meaning, significance, and limitations of these concepts
and their role in the evolution of current understanding of the universe.
Concepts to be covered include Copernican astronomy, Newtonian
mechanics, energy, electricity and magnetism, relativity, and quantum
theory. Intended primarily for non-science students. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 111. *INQUIRING INTO PHYSICAL PHENOMENA. (4 Credits)
Development of conceptual understandings through investigation of
everyday phenomena. Emphasis is on questioning, predicting, exploring,
observing, discussing, and writing in physical science contexts. Students
document their initial thinking, record their evolving understandings, and
write reflections upon how their thinking changed and what fostered their
learning. Lec/lab. (Baccalaureate Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 198. FIRST-YEAR ORIENTATION. (1 Credit)
Introduction to the Physics Department including educational, research,
and career opportunities. Recommended for all freshman and transfer
physics majors, but open to all students interested in learning about
opportunities in Physics.

PH 199. SPECIAL STUDIES. (1-16 Credits)
One-credit sections are graded pass/no pass. 
This course is repeatable for 99 credits.

PH 201. *GENERAL PHYSICS. (5 Credits)
Introductory survey course covering a broad spectrum of classical
and modern physics with applications. Topics include dynamics,
vibrations and waves, electricity and magnetism, optics, and modern
physics. Laboratory and recitation sections accompany the lectures.
Mathematical preparation should include college algebra and
trigonometry. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 201H
Recommended: MTH 111 and MTH 112

PH 202. *GENERAL PHYSICS. (5 Credits)
Introductory survey course covering broad spectrum of classical
and modern physics with applications. Topics include dynamics,
vibrations and waves, electricity and magnetism, optics, and modern
physics. Laboratory and recitation sections accompany the lectures.
Mathematical preparation should include college algebra and
trigonometry. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 202H
Recommended: MTH 111 and MTH 112 and PH 201

PH 203. *GENERAL PHYSICS. (5 Credits)
Introductory survey course covering broad spectrum of classical
and modern physics with applications. Topics include dynamics,
vibrations and waves, electricity and magnetism, optics, and modern
physics. Laboratory and recitation sections accompany the lectures.
Mathematical preparation should include college algebra and
trigonometry. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 203H
Recommended: MTH 111 and MTH 112 and PH 202

PH 205. *SOLAR SYSTEM ASTRONOMY. (4 Credits)
History, laws, and tools of astronomy. Composition, motion, and origin
of the sun, planets, moons, asteroids, and comets. An accompanying
laboratory is used for demonstrations, experiments, and projects, as well
as for outdoor observations. The courses in the astronomy sequence
(PH 205, PH 206, PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 206. *STARS AND STELLAR EVOLUTION. (4 Credits)
Properties of stars; star formation, evolution, and death; supernovae,
pulsars, and black holes. An accompanying laboratory is used for
demonstrations, experiments, and projects, as well as for outdoor
observations. The courses in the astronomy sequence (PH 205, PH 206,
PH 207) can be taken in any order. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science

PH 207. *GALAXIES, QUASARS, AND COSMOLOGY. (4 Credits)
Nature and content of galaxies, properties of quasars, and the cosmic
background radiation. Emphasis on the Big-Bang model and its features.
An accompanying laboratory is used for demonstrations, experiments,
and projects, as well as for outdoor observations. The courses in the
astronomy sequence (PH 205, PH 206, PH 207) can be taken in any order.
Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
PH 211. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 211H
Recommended: MTH 251 and concurrent enrollment in MTH 252 and a PH 221 recitation section

PH 211H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Equivalent to: PH 211
Recommended: MTH 251 and concurrent enrollment in MTH 252 and a PH 211 recitation section

PH 212. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Prerequisites: PH 211 with D- or better or PH 211H with D- or better
Equivalent to: PH 212H, PH 212H
Recommended: MTH 252 and concurrent enrollment in PH 222 and MTH 254

PH 212H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Prerequisites: PH 211 with D- or better or PH 211H with D- or better
Equivalent to: PH 212H, PH 212H
Recommended: MTH 252 and concurrent enrollment in PH 222 and MTH 254

PH 213. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: PH 213H
Recommended: MTH 254 and (PH 212 or PH 212H). Concurrent enrollment in a recitation section is strongly recommended.

PH 213H. *GENERAL PHYSICS WITH CALCULUS. (4 Credits)
A comprehensive introductory survey course intended primarily for students in the sciences and engineering. Topics include mechanics, wave motion, thermal physics, electromagnetism, and optics. Elementary calculus is used. Laboratory work accompanies the lectures. Lec/lab/rec. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science; HNRS – Honors Course Designator
Equivalent to: PH 213
Recommended: MTH 254 and (PH 212 or PH 212H). Concurrent enrollment in a recitation section is strongly recommended.

PH 221. RECITATION FOR PHYSICS 211. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Prerequisites: PH 211 (may be taken concurrently) with D- or better or PH 211H (may be taken concurrently) with D- or better
Equivalent to: PH 221H

PH 221H. RECITATION FOR PHYSICS 211. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 211 (may be taken concurrently) with D- or better or PH 211H (may be taken concurrently) with D- or better
Equivalent to: PH 221

PH 222. RECITATION FOR PHYSICS 212. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Graded P/N.
Prerequisites: PH 212 (may be taken concurrently) with D- or better or PH 212H (may be taken concurrently) with D- or better
Equivalent to: PH 222H

PH 222H. RECITATION FOR PHYSICS 212. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 212 (may be taken concurrently) with D- or better or PH 212H (may be taken concurrently) with D- or better
Equivalent to: PH 222
Recommended: Concurrent enrollment in PH 212 or PH 212H

PH 223. RECITATION FOR PHYSICS 213. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Prerequisites: PH 213 (may be taken concurrently) with D- or better or PH 213H (may be taken concurrently) with D- or better
Equivalent to: PH 223H

PH 223H. RECITATION FOR PHYSICS 213. (1 Credit)
One-hour weekly session for the development of problem-solving skills in calculus-based general physics. Lec/rec. Graded P/N.
Attributes: HNRS – Honors Course Designator
Prerequisites: PH 213 (may be taken concurrently) with D- or better or PH 213H (may be taken concurrently) with D- or better
Equivalent to: PH 223
Recommended: Concurrent enrollment in PH 213

PH 265. SCIENTIFIC COMPUTING. (3 Credits)
Basic computational tools and techniques for courses in science and engineering. Project approach to problem solving using symbolic and compiled languages with visualization. Basic computer literacy assumed.
Equivalent to: CS 265
Recommended: Concurrent enrollment in MTH 251
PH 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PH 313. *ENERGY ALTERNATIVES. (3 Credits)
Exploration of the challenges and opportunities posed by dwindling resources; physical and technological basis of our current energy alternatives; new or controversial technologies such as nuclear or solar power; overview of resource availability, patterns of energy consumption, and current governmental policies. (Bacc Core Course)
Equivalent to: PH 313H
Recommended: Upper-division standing and 12 credits of introductory science.

PH 313H. *ENERGY ALTERNATIVES. (3 Credits)
Exploration of the challenges and opportunities posed by dwindling resources; physical and technological basis of our current energy alternatives; new or controversial technologies such as nuclear or solar power; overview of resource availability, patterns of energy consumption, and current governmental policies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society;
HNRS – Honors Course Designator
Equivalent to: PH 313
Recommended: Upper-division standing and 12 credits of introductory science.

PH 315. PHYSICS OF CONTEMPORARY CHALLENGES. (3 Credits)
An introduction to thermal and quantum physics in the context of contemporary challenges faced by our society, such as power generation, energy efficiency, and global warming.
Recommended: PH 211

PH 317. *EXPERIMENTAL PHYSICS. (3 Credits)
Conducting experiments, understanding equipment, modeling physical phenomena, analyzing and presenting data, sources of variation and uncertainty. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PH 213 with C- or better and PH 315 [C-] and PH 335 [C-]

PH 317X. EXPERIMENTAL PHYSICS. (3 Credits)
Conducting experiments, understanding equipment, modeling physical phenomena, analyzing and presenting data, data-driven conclusions and inferences, statistical analysis.
Prerequisites: PH 213 with C- or better and PH 315 [C-] and PH 335 [C-]

PH 331. *SOUND, HEARING, AND MUSIC. (3 Credits)
Basic course in the physics, technology, and societal implications of sound. Intended for students in nontechnical majors. Topics include wave motion, hearing and the perception of sound, noise pollution, music and musical instruments, architectural acoustics, and sound recording and reproduction. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and one year of university science.

PH 332. *LIGHT, VISION, AND COLOR. (3 Credits)
Basic physics of light, optical instruments (lenses, telescopes, microscopes), the eye and visual perception, colors, photography, environmental lighting, lasers and holography. For nontechnical majors.
(Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: Upper-division standing and one year of university science.

PH 335. TECHNIQUES OF THEORETICAL MECHANICS. (3 Credits)
Newtonian, Lagrangian, and Hamiltonian classical mechanics. Special relativity with relativistic mechanics.
Recommended: PH 212 and MTH 254

PH 365. COMPUTATIONAL PHYSICS LAB. (1 Credit)
A project-driven laboratory experience in computational physics. Includes the use of basic mathematical and numerical techniques in computer calculations leading to solutions for typical physical problems. Topics to be covered will coordinate with the Paradigms in Physics course sequence.
Prerequisites: PH 213 with C- or better
Equivalent to: PH 365X
Recommended: Concurrent enrollment in Paradigms.

PH 366. COMPUTATIONAL PHYSICS LAB. (1 Credit)
A project-driven laboratory experience in computational physics. Includes the use of basic mathematical and numerical techniques in computer calculations leading to solutions for typical physical problems. Topics to be covered will coordinate with the Paradigms in Physics course sequence.
Prerequisites: PH 213 with C- or better
Recommended: Concurrent enrollment in Paradigms.

PH 367. COMPUTATIONAL PHYSICS LAB. (1 Credit)
A project-driven laboratory experience in computational physics. Includes the use of basic mathematical and numerical techniques in computer calculations leading to solutions for typical physical problems. Topics to be covered will coordinate with the Paradigms in Physics course sequence.
Prerequisites: PH 213 with C- or better
Recommended: Concurrent enrollment in Paradigms.

PH 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PH 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PH 399
This course is repeatable for 16 credits.

PH 401. RESEARCH. (1-16 Credits)
A research project under the supervision of a faculty member, whose approval must be arranged by the student in advance of registration.
This course is repeatable for 16 credits.

PH 403. *THESIS. (1-16 Credits)
A research project leading to a thesis under the supervision of a faculty member, whose approval must be arranged by the student in advance of registration. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

PH 405. READING AND CONFERENCE. (1-16 Credits)
An independent study project under the supervision of a faculty member, whose approval must be arranged by the student in advance of registration.
This course is repeatable for 16 credits.

PH 407. SEMINAR. (1-16 Credits)
Departmental seminars or colloquium. Graded P/N.
Equivalent to: PH 407H
This course is repeatable for 16 credits.
PH 407H. SEMINAR. (1-16 Credits)
Departmental seminars or colloquium.
Attributes: HNRS – Honors Course Designator
Equivalent to: PH 407
This course is repeatable for 16 credits.

PH 409. PHYSICS TEACHING PRACTICUM. (1-6 Credits)
Physics practicum experience for students assisting in Physics courses. Includes training in course content and development of instructional materials. Admission is by application. See the department office in Weniger 301 for details.
This course is repeatable for 6 credits.

PH 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

PH 411. ELECTRONICS. (3 Credits)
Covers how to build and analyze basic circuits. Topics include passive dc and ac circuits including filters, complex impedance, Fourier analysis, operational amplifiers, semiconductor diodes, and transistors.
Recommended: PH 423

PH 415. COMPUTER INTERFACING AND INSTRUMENTATION. (3 Credits)
Applications of computers as scientific instruments, with emphasis on hardware and instrumentation, online data acquisition, and computer control of experiments.
Recommended: Upper-division and PH 412/PH 512 or equivalent background in electronics

PH 422. PARADIGMS IN PHYSICS: STATIC FIELDS. (3 Credits)
Theory of static electric, magnetic, and gravitational potentials and fields using the techniques of vector calculus in three dimensions.
Equivalent to: PH 322
Recommended: PH 213 and MTH 255

PH 423. PARADIGMS IN PHYSICS: ENERGY AND ENTROPY. (3 Credits)
Thermodynamics and canonical statistical mechanics.
Equivalent to: PH 323
Recommended: PH 213

PH 424. PARADIGMS IN PHYSICS: OSCILLATIONS AND WAVES. (3 Credits)
Dynamics of mechanical and electrical oscillation using Fourier series and integrals; time and frequency representations for driven damped oscillators, resonance; one-dimensional waves in classical mechanics and electromagnetism; normal modes.
Recommended: PH 213 and PH 411 and MTH 256

PH 425. PARADIGMS IN PHYSICS: QUANTUM FUNDAMENTALS. (3 Credits)
Introduction to quantum mechanics through Stern-Gerlach spin measurements. Probability, eigenvalues, operators, measurement, state reduction, Dirac notation, matrix mechanics, time evolution. Quantum behavior of a one-dimensional well.
Recommended: PH 213 and concurrent enrollment in MTH 341

PH 426. PARADIGMS IN PHYSICS: CENTRAL FORCES. (3 Credits)
Gravitational and electrostatic forces; angular momentum and spherical harmonics, separation of variables in classical and quantum mechanics, hydrogen atom.
Recommended: PH 213 and PH 422 and PH 425 and concurrent enrollment in PH 335

PH 427. PARADIGMS IN PHYSICS: PERIODIC SYSTEMS. (3 Credits)
Quantum waves in position and momentum space; Bloch waves in one-dimensional periodic systems, and the reciprocal lattice; coupled harmonic oscillators; phonons.
Recommended: PH 424 and PH 425 and concurrent enrollment in PH 315

PH 431. CAPSTONES IN PHYSICS: ELECTROMAGNETISM. (3 Credits)
Static electric and magnetic fields in matter, electrodynamics, Maxwell equations, electromagnetic waves, wave guides, dipole radiation.
Recommended: (PH 424 or 524) and (PH 426 or PH 526)

PH 441. CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS. (3 Credits)
Entropy and quantum mechanics; canonical Gibbs probability; ideal gas; thermal radiation; Einstein and Debye lattices; grand canonical Gibbs probability; ideal Fermi and Bose gases; chemical reactions and phase transformations.
Recommended: (PH 423 or PH 523) and (PH 451 or PH 551)

PH 451. CAPSTONES IN PHYSICS: QUANTUM MECHANICS. (3 Credits)
Wave mechanics, Schroedinger equation, operators, harmonic oscillator, identical particles, atomic fine structure, approximation methods and applications.
Recommended: (PH 424 or PH 524) and (PH 425 or PH 525) and (PH 426 or PH 526)

PH 455. ASTROPHYSICS. (3 Credits)
Physics of stars and the cosmos.
Recommended: PH 213; PH 315 or equivalent junior-level background in modern physics and thermodynamics.

PH 464. SCIENTIFIC COMPUTING II. (3 Credits)
Mathematical, numerical, and conceptual elements forming foundations of scientific computing: computer hardware, algorithms, precision, efficiency, verification, numerical analysis, algorithm scaling, profiling, and tuning.
Equivalent to: PH 365

PH 465. COMPUTATIONAL PHYSICS. (3 Credits)
The use of basic mathematical and numerical techniques in computer calculations leading to solutions for typical physical problems. Topics to be covered include models and applications ranging from classical mechanics and electromagnetism to modern solid state and particle physics.
Recommended: PH 464 or PH 564

PH 481. PHYSICAL OPTICS. (4 Credits)
Wave propagation, polarization, interference, diffraction, and selected topics in modern optics.
Recommended: PH 431 or PH 531

PH 482. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.
Equivalent to: ECE 482
Recommended: ECE 391 or (PH 481 or PH 581)

PH 483. GUIDED WAVE OPTICS. (4 Credits)
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.
Equivalent to: ECE 483
Recommended: Completion or concurrent enrollment in ECE 391 or PH 481

PH 495. INTRODUCTION TO PARTICLE AND NUCLEAR PHYSICS. (3 Credits)
Elementary particles and forces, nuclear structure and reactions.
Recommended: PH 451 or PH 551

PH 499. SPECIAL TOPICS. (1-16 Credits)
Topics vary from year to year. May be repeated for credit. Not offered every year.
This course is repeatable for 16 credits.
PH 501. RESEARCH. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 16 credits.

PH 503. THESIS. (1-16 Credits)  
This course is repeatable for 999 credits.

PH 505. READING AND CONFERENCE. (1-16 Credits)  
This course is repeatable for 16 credits.

PH 507. SEMINAR. (1-16 Credits)  
Section 1: Departmental Colloquium. Section 3: Nuclear and Particle Physics. Section 5: Atomic, Molecular, and Optical Physics. Section 7: Solid State Physics. Section 9: Computational Physics. One-credit options are graded P/N.  
This course is repeatable for 16 credits.

PH 510. INTERNSHIP. (1-16 Credits)  
This course is repeatable for 16 credits.

PH 511. ELECTRONICS. (3 Credits)  
Covers how to build and analyze basic circuits. Topics include passive dc and ac circuits including filters, complex impedance, Fourier analysis, operational amplifiers, semiconductor diodes, and transistors.  
Recommended: PH 213

PH 512. ANALOG AND DIGITAL ELECTRONICS. (3 Credits)  
Circuit theory. Passive dc and ac circuits including filters, resonance, complex impedance and Fourier analysis. Operational amplifiers, gates and combinational logic. Semiconductor principles, diodes, transistors, BJTs and FETs. Multiplexing, flip-flops and sequential logic, 555 timer, registers and memory, DAC, ADC.  
Recommended: PH 511 and completion or concurrent enrollment in PH 314

PH 515. COMPUTER INTERFACING AND INSTRUMENTATION. (3 Credits)  
Applications of computers as scientific instruments, with emphasis on hardware and instrumentation, online data acquisition, and computer control of experiments.  
Recommended: PH 412 or PH 512 or equivalent background in electronics

PH 531. CAPSTONES IN PHYSICS: ELECTROMAGNETISM. (3 Credits)  
Static electric and magnetic fields in matter, electrodynamics, Maxwell equations, electromagnetic waves, wave guides, dipole radiation.  
Recommended: (PH 424 or PH 524) and (PH 426 or PH 526)

PH 541. CAPSTONES IN PHYSICS: THERMAL AND STATISTICAL PHYSICS. (3 Credits)  
Entropy and quantum mechanics; canonical Gibbs probability; ideal gas; thermal radiation; Einstein and Debye lattices; grand canonical Gibbs probability; ideal Fermi and Bose gases; chemical reactions and phase transformations.  
Recommended: (PH 423 or PH 523) and (PH 451 or PH 551)

PH 551. CAPSTONES IN PHYSICS: QUANTUM MECHANICS. (3 Credits)  
Wave mechanics, Schroedinger equation, operators, harmonic oscillator, identical particles, atomic fine structure, approximation methods and applications.  
Recommended: (PH 424 or PH 524) and (PH 425 or PH 525) and (PH 426 or PH 526)

PH 555. ASTROPHYSICS. (3 Credits)  
Physics of stars and the cosmos.  
Recommended: PH 213; PH 315 or equivalent junior-level background in modern physics and thermodynamics.

PH 562. MATHEMATICAL PHYSICS. (3 Credits)  
Fundamental mathematical techniques needed for graduate students in physics. Topics include vector spaces and operators; fourier series, integrals, and transforms; partial differential equations; special functions, distributions, and delta functions; Green's functions; complex analysis.

PH 564. SCIENTIFIC COMPUTING II. (3 Credits)  
Mathematical, numerical, and conceptual elements forming foundations of scientific computing: computer hardware, algorithms, precision, efficiency, verification, numerical analysis, algorithm scaling, profiling, and tuning. Lec/lab.  
Equivalent to: PH 365

PH 575. INTRODUCTION TO SOLID STATE PHYSICS. (3 Credits)  
Introduction to condensed matter physics for majors in physics, chemistry, and engineering. Topics include band structure, free electron behavior, optical properties, magnetism, and lattice excitations. Recommended: (PH 451 or PH 551) and concurrent enrollment in PH 427 or PH 527

PH 581. PHYSICAL OPTICS. (4 Credits)  
Wave propagation, polarization, interference, diffraction, and selected topics in modern optics.  
Recommended: PH 431 or PH 531

PH 582. OPTICAL ELECTRONIC SYSTEMS. (4 Credits)  
Photodetectors, laser theory, and laser systems. Lec/lab. CROSSLISTED as ECE 482/PH 482 and ECE 582/PH 582.  
Equivalent to: ECE 582

PH 583. GUIDED WAVE OPTICS. (4 Credits)  
Optical fibers, fiber mode structure and polarization effects, fiber interferometry, fiber sensors, optical communication systems. Lec/lab. CROSSLISTED as ECE 483/PH 483 and ECE 583/PH 583.  
Equivalent to: ECE 583

Recommended: Completion or concurrent enrollment in ECE 391 or PH 481/581

PH 585. ATOMIC, MOLECULAR, AND OPTICAL PHYSICS. (3 Credits)  
Atomic and molecular structure, interaction with electromagnetic fields, atomic and molecular spectra, spectroscopic techniques, laser theory, nonlinear optics. Recommended: (PH 431 or PH 531) or (PH 451 or PH 551)

PH 591. BIOLOGICAL PHYSICS. (3 Credits)  
Basic physics principles applied to the kinetics and dynamics of molecular and cellular processes. Ion channels, two-state systems, dynamics of molecular motors, cell signalling, and multicellular phenomena.  
Recommended: PH 320, PH 421, PH 422 and PH 423 or junior-level background in classical mechanics, electromagnetism, and thermodynamics

PH 595. INTRODUCTION TO PARTICLE AND NUCLEAR PHYSICS. (3 Credits)  
Elementary particles and forces, nuclear structure and reactions.  
Recommended: PH 451 or PH 551

PH 599. SPECIAL TOPICS. (1-16 Credits)  
(See PH 499 for description.)  
This course is repeatable for 16 credits.

PH 601. RESEARCH. (1-16 Credits)  
This course is repeatable for 16 credits.

PH 603. THESIS. (1-16 Credits)  
This course is repeatable for 999 credits.
PH 605. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

PH 607. SEMINAR. (1-16 Credits)

Section 1: Departmental Colloquium. Section 3: Nuclear and Particle Physics. Section 5: Atomic, Molecular, and Optical Physics. Section 7: Solid State Physics. Section 9: Computational Physics. One-credit options are graded P/N.

This course is repeatable for 16 credits.

PH 621. DYNAMICS OF SINGLE- AND MULTI-PARTICLE SYSTEMS. (3 Credits)

Introduction to theory of non-linear systems. Chaos in Hamiltonian and dissipative systems. Lyapunov exponents, fractal geometries.

Recommended: PH 435 or PH 535

PH 631. ELECTROMAGNETIC THEORY. (3 Credits)

Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields.

Recommended: PH 431 or PH 531

PH 632. ELECTROMAGNETIC THEORY. (3 Credits)

Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields.

Recommended: PH 431 or PH 531

PH 633. ELECTROMAGNETIC THEORY. (3 Credits)

Electrostatics; multipole expansion; magnetostatics; radiation fields; dynamics of relativistic particles and electromagnetic fields.

Recommended: PH 432 or (PH 431 or PH 531)

PH 641. STATISTICAL THERMOPHYSICS. (3 Credits)

Macroscopic thermodynamics and kinetic theory. Classical and quantal statistical ensembles; partition functions. Applications to atoms and molecules, clustering, solids, radiation.

Recommended: PH 435 or PH 535

PH 642. STATISTICAL THERMOPHYSICS. (3 Credits)

Macroscopic thermodynamics and kinetic theory. Classical and quantal statistical ensembles; partition functions. Applications to atoms and molecules, clustering, solids, radiation.

Recommended: PH 641

PH 651. QUANTUM MECHANICS. (3 Credits)

Basic principles of nonrelativistic quantum theory and applications. Schrödinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering.

Recommended: (PH 435 or PH 535) and (PH 451 or PH 551)

PH 652. QUANTUM MECHANICS. (3 Credits)

Basic principles of nonrelativistic quantum theory and applications. Schrödinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering.

Recommended: (PH 435 or PH 535) and (PH 451 or PH 551) and PH 651

PH 653. QUANTUM MECHANICS. (3 Credits)

Basic principles of nonrelativistic quantum theory and applications. Schrödinger theory, quantum theory of angular momentum, matrix mechanics, perturbation theory, identical particles, scattering.

Recommended: (PH 435 or PH 535) and (PH 451 or PH 551) and PH 651

PH 654. ADVANCED QUANTUM THEORY. (3 Credits)

Scattering theory, second quantization and many body theory, relativistic quantum mechanics, quantization of fields, quantum electrodynamics, and elementary particles.

Recommended: PH 653

PH 671. SOLID STATE PHYSICS, ELECTRON TRANSPORT. (2 Credits)

Fundamentals of solid state physics, Boltzmann transport, phonon and defect scattering, quantum transport, transport in magnetic field, localization, Mott-insulator transition, electron tunneling, superconductivity. Offered in alternate years.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 672. SOLID STATE PHYSICS, THEORY. (2 Credits)

The many-body problem, density functional theory, excited states properties, BCS theory of superconductivity. Offered in alternate years.

Recommended: PH 575 and PH 654 and basic knowledge of electromagnetism and quantum mechanics.

PH 673. SOLID STATE PHYSICS, NANOSCIENCE AND NANOTECHNOLOGY. (2 Credits)

Introduction to nanoscience and nanotechnology; semiconductor quantum wells, wires, and dots; bulk metals vs nanoparticles; molecular ensembles vs single molecules; fabrication of nanoparticles and nanostructured materials; scanning probe microscopy; advanced optical imaging and manipulation. Offered in alternate years.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 674. SOLID STATE PHYSICS, MAGNETISM. (2 Credits)

Magnetism of atoms; interaction between magnetic atoms, magnetic ordering in crystalline solids; excitations in magnetic solids; temperature dependent phenomena in magnetic solids; magnetism of metals, alloys, insulators and semiconductors; topics of considerable interest in contemporary research.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 681. ATOMIC, MOLECULAR AND OPTICAL PHYSICS, MODERN OPTICS. (2 Credits)

Maxwell's equations in matter; refraction, phase and group indices; material and geometry dispersion; effective-medium regime. Not offered every year.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 682. ATOMIC, MOLECULAR, OPTICAL PHYSICS, SEMICONDUCTOR OPTICS. (2 Credits)

Linear response theory; polarization effects; interband excitations and emissions; low dimensional systems; excitons; phonons; semiconductor lasers; photovoltaics. Offered alternate years.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 683. ATOMIC, MOLECULAR AND OPTICAL PHYSICS, NONLINEAR OPTICS. (2 Credits)

Coherent nonlinear electromagnetic phenomena; harmonic generation and parametric mixing; quantum mechanical description of multi-photon interactions; incoherent multi-photon interactions; coherent nonlinear optical phenomena and spectroscopies. Offered in alternate years.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.

PH 684. ATOMIC, MOLECULAR AND OPTICAL PHYSICS, ULTRAFast OPTICS. (2 Credits)

Introduction of ultrafast optical science; short pulse propagation in linear media; pulse stretching and compressing; Q-switching and mode-locking; characterization of femtosecond lasers; coherent optical effects. Offered in alternate years.

Recommended: Basic knowledge of electromagnetism and quantum mechanics.
PH 699. SPECIAL TOPICS: BIOLOGICAL PHYSICS. (3 Credits)  
Topics vary from year to year. Not offered every year.  
This course is repeatable for 9 credits.

Plant Breeding & Genetics (PBG)

PBG 199. SPECIAL TOPICS. (1-16 Credits)  
Equivalent to: PBG 199H  
This course is repeatable for 16 credits.

PBG 199H. SPECIAL TOPICS. (1-16 Credits)  
Attributes: HNRS – Honors Course Designator  
Equivalent to: PBG 199  
This course is repeatable for 16 credits.

PBG 299. SPECIAL TOPICS. (1-16 Credits)  
Equivalent to: PBG 299H  
This course is repeatable for 16 credits.

PBG 299H. SPECIAL TOPICS. (1-16 Credits)  
Attributes: HNRS – Honors Course Designator  
Equivalent to: PBG 299  
This course is repeatable for 16 credits.

PBG 399. SPECIAL TOPICS. (1-16 Credits)  
This course is repeatable for 16 credits.

PBG 401. RESEARCH. (1-16 Credits)  
This course is repeatable for 16 credits.

PBG 403. THESIS. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 99 credits.

PBG 405. READING AND CONFERENCE. (1-16 Credits)  
Equivalent to: PBG 405H  
This course is repeatable for 16 credits.

PBG 405H. READING AND CONFERENCE. (1-16 Credits)  
Attributes: HNRS – Honors Course Designator  
Equivalent to: PBG 405  
This course is repeatable for 16 credits.

PBG 407. SEMINAR. (1-16 Credits)  
This course is repeatable for 16 credits.

PBG 409. TEACHING PRACTICUM. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 16 credits.

PBG 410. INTERNSHIP. (1-12 Credits)  
Offered via Ecampus only.  
This course is repeatable for 12 credits.

PBG 430. PLANT GENETICS. (3 Credits)  
Introduction to the principles of plant genetics with an emphasis on the structure and function of economically important plant genomes.  
Equivalent to: HORT 430  
Recommended: One year of biology and chemistry.

PBG 431. PLANT GENETICS RECITATION. (1 Credit)  
Review and demonstration of plant genetics principles.  
Equivalent to: CSS 431, HORT 431

PBG 441. PLANT TISSUE CULTURE. (4 Credits)  
Principles, methods, and applications of plant tissue culture. Laboratory is an important part of course. Topics include callus culture, regeneration, somaclonal variation, micropropagation, anther culture, somatic hybridization, and transformation. CROSSLISTED as PBG 441 and MCB 541/PBG 541.  
Equivalent to: HORT 441  
Recommended: (BI 311 and BOT 331) or PBG 430 or CSS 430

PBG 450. PLANT BREEDING. (4 Credits)  
An introduction to the genetic improvement of self-pollinated, cross-pollinated, and asexually propagated species and the genetic principles on which breeding methods are based. Examples are drawn from a wide range of crops, including cereal grains, grasses, fruits, nuts, and vegetables; guest lecturers discuss their breeding programs. Additional topics include crop evaluation, germplasm preservation, disease resistance, and biotechnology. Lec/lab.  
Prerequisites: PBG 430 with D- or better  
Equivalent to: CSS 450, HORT 450  
Recommended: BI 311 or PBG 430

PBG 499. SPECIAL TOPICS. (1-16 Credits)  
Equivalent to: PBG 499H  
This course is repeatable for 16 credits.

PBG 499H. SPECIAL TOPICS. (1-16 Credits)  
Attributes: HNRS – Honors Course Designator  
Equivalent to: PBG 499  
This course is repeatable for 16 credits.

PBG 501. RESEARCH. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 16 credits.

PBG 503. THESIS. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 16 credits.

PBG 505. READING AND CONFERENCE. (1-16 Credits)  
This course is repeatable for 16 credits.

PBG 506. PROJECTS. (1-16 Credits)  
This course is repeatable for 16 credits.

PBG 507. SEMINAR. (1-16 Credits)  
Graded P/N.  
This course is repeatable for 16 credits.

PBG 508. WORKSHOP. (1-16 Credits)  
This course is repeatable for 16 credits.

PBG 509. PRACTICUM IN TEACHING. (1-3 Credits)  
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/PBG 509/SOIL 509.  
Equivalent to: CROP 509, ENT 509, SOIL 509  
This course is repeatable for 9 credits.

PBG 510. INTERNSHIP. (4 Credits)  
Offered via Ecampus only.  
This course is repeatable for 12 credits.

PBG 513. PLANT GENETIC ENGINEERING. (3 Credits)  
Principles, methods, and recent developments in the genetic engineering of higher plants. Offered alternate years.  
Equivalent to: HORT 513  
Recommended: (BI 311 and BOT 331) or (CSS 430 or CSS 530) or (HORT 430 or HORT 530) or (PBG 430 or PBG 530)
PBG 519. CURRENT TOPICS IN PLANT BREEDING AND GENETICS. (2 Credits)
Provides an advanced understanding of plant breeding and genetics and their relationship to other disciplines through critical analysis of the scientific literature. Practice synthesizing information and presenting findings to peers. Instructors, topics, and specific learning objectives vary from term to term. CROSSLISTED as HORT 519/PBG 519.
Equivalent to: HORT 519
This course is repeatable for 12 credits.

PBG 530. PLANT GENETICS. (3 Credits)
Introduction to the principles of plant genetics with an emphasis on the structure and function of economically important plant genomes.
Equivalent to: HORT 530
Recommended: One year of biology and chemistry.

PBG 541. PLANT TISSUE CULTURE. (4 Credits)
Principles, methods, and applications of plant tissue culture. Laboratory is important part of course. Topics include callus culture, regeneration, somaclonal variation, micropropagation, anther culture, somatic hybridization, and transformation. CROSSLISTED as PBG 441 and MCB 541/PBG 541.
Equivalent to: HORT 541, MCB 541
Recommended: (BI 311 and BOT 331) or PBG 430

PBG 550. PLANT BREEDING. (4 Credits)
An introduction to the genetic improvement of self-pollinated, cross-pollinated, and asexually propagated species and the genetic principles on which breeding methods are based. Example are drawn from a wide range of crops, including cereal grains, grasses, fruits, nuts, and vegetables; guest lecturers discuss their breeding programs. Additional topics include crop evaluation, germplasm preservation, disease resistance, and biotechnology. Lec/lab.
Equivalent to: CSS 550, HORT 550
Recommended: BI 311 or PBG 430 or PBG 530

PBG 551. BREEDING CLONAL CROPS. (1 Credit)
The overall goal of the course is to gain fundamental knowledge of breeding methods for clonal crops; these methods are different from those used for seed-propagated crops. Specific examples from a wide array of plant species (tree fruits, berries, tree nuts, potato, sweet potato, cassava, cacao) will be provided to illustrate application of the fundamental knowledge.
Prerequisites: PBG 450 with C or better or PBG 550 with C or better

PBG 552. PLANT BREEDING AND SEED PRODUCTION IN ORGANIC SYSTEMS. (3 Credits)
Genetic improvement and seed propagation of self-pollinated and cross-pollinated crops bred for and used in organic production. The philosophical basis for organic agriculture will be reviewed in the context of what breeding technologies are allowed and why. Important traits for adaptation to organic production will be described. Models for organic plant breeding and examples of such programs are provided.
Prerequisites: PBG 530 with D or better
Recommended: BI 311 or PBG 430

PBG 556. CROP PLANT DOMESTICATION. (2 Credits)
Learning is based on discussion of the contemporary literature on crop plant origins and domestication. The major agronomic and horticultural crops will be covered. Topics include primary centers of domestication, traits altered by domestication, effect of genetic architecture and local ecology on domestication, and importance of genetic diversity to current plant improvement efforts.

PBG 557. PLANTS AND PATENTS. (2 Credits)
Learn about different methods of intellectual property protection in agriculture with a focus on plant patents, plant variety protection and utility patents. The rights, current issues and restrictions that different types of patents allow will be presented through reading the current literature.

PBG 591. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PBG 603. DISSERTATION. (1-16 Credits)
Graded P/N.
This course is repeatable for 999 credits.

PBG 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: CROP 609, ENT 609, SOIL 609
This course is repeatable for 9 credits.

PBG 620. DNA FINGERPRINTING. (1 Credit)
Principles and methods for producing and analyzing DNA fingerprints. Offered alternate years. CROSSLISTED as MCB 620/PBG 620.
Equivalent to: CSS 620, MCB 620
Recommended: BI 311 or CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530

PBG 621. GENETIC MAPPING. (1 Credit)
Principles and methods for constructing genetic maps comprised of molecular and other genetic markers. Offered alternate years. CROSSLISTED as MCB 621/PBG 621.
Equivalent to: CSS 621, MCB 621
Recommended: BI 311 or CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530

PBG 622. MAPPING QUANTITATIVE TRAIT LOCI. (1 Credit)
Principles and methods for mapping genes underlying phenotypically complex traits. Offered alternate years. CROSSLISTED as MCB 622/PBG 622.
Equivalent to: CSS 622, MCB 622
Recommended: CROP 590 or CSS 590 or ST 513
PBG 650. ADVANCED PLANT BREEDING AND QUANTITATIVE GENETICS. (3 Credits)
Pedigree, bulk, single-seed-descent, doubled haploid, backcross, testcross, mass, and half-sib, S~1~, and S~2~ family breeding methods; breeding hybrids and selecting sources of alleles for developing superior hybrids; the nature and consequences of genotype by environment interactions; marker-assisted backcross and inbred line breeding; quantitative trait locus mapping; random linear models; designing and analyzing cultivar, line, and family selection experiments. Offered odd years.
Equivalent to: CSS 650
Recommended: (CSS 430 or CSS 530 or PBG 430 or PBG 530 or HORT 430 or HORT 530) and (CSS 450 or CSS 550 or PBG 450 or PBG 550 or HORT 450 or HORT 550) and (ST 411 or ST 511) and (ST 412 or ST 512) and (ST 413 or ST 513)

PBG 691. SELECTED TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PBG 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Political Science (PS)

PS 110. *GOVERNING AFTER THE ZOMBIE APOCALYPSE. (3 Credits)
Constitution-writing in a post-apocalyptic world. Students write a constitution that addresses issues of difference, power, and discrimination. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PS 110H

PS 110H. *GOVERNING AFTER THE ZOMBIE APOCALYPSE. (3 Credits)
Constitution-writing in a post-apocalyptic world. Students write a constitution that addresses issues of difference, power, and discrimination. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PS 110

PS 201. *INTRODUCTION TO UNITED STATES GOVERNMENT AND POLITICS. (4 Credits)
Description and analysis of American politics and government, including such topics as interest groups, parties, elections, media, the presidency, Congress, the Constitution, and the courts. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: PS 101, PS 102, PS 102H

PS 204. *INTRODUCTION TO COMPARATIVE POLITICS. (4 Credits)
Major concepts of comparative politics applied to various political settings; the United States, Western Europe, Communist regimes, and developing countries. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

PS 205. *INTRODUCTION TO INTERNATIONAL RELATIONS. (4 Credits)
Analysis of the international system and factors affecting world politics. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: PS 205H

PS 206. *INTRODUCTION TO POLITICAL THOUGHT. (4 Credits)
Introduction to political philosophy. Major ideas and issues of selected political thinkers. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PS 206H

PS 221. INTRODUCTION TO LAW. (4 Credits)
Overview of American law and the U.S. legal system. Topics include legal concepts from selected substantive areas of law, structures and processes of law, and development of basic legal analytical skills.

PS 299. SPECIAL STUDIES. (1-4 Credits)
PREREQ: Departmental approval required.
This course is repeatable for 4 credits.

PS 300. *RESEARCH METHODS. (4 Credits)
Qualitative and quantitative approaches to the study of political phenomena. The role of values, theory, hypothesis, data collection, and analysis in evaluating and conducting political science research. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: PS 400

PS 311. CONGRESSIONAL POLITICS. (4 Credits)
Congressional politics, both on Capitol Hill and in the district, including campaigns, constituent relations, lobbying, legislating, and the legislature in democratic theory.
Equivalent to: PS 411

PS 312. PRESIDENTIAL POLITICS. (4 Credits)
Office, powers, and politics of the American presidency, with reference to other executive offices in American government; emphasis on the importance and effect of the presidency in American politics.

PS 313. CAMPAIGNS AND ELECTIONS. (4 Credits)
Political parties and elections, the conduct of electoral campaigns, the electorate and voting behavior, electoral system, exercise of the suffrage, extent and consequences of voter participation.
Equivalent to: PS 413

PS 314. INTEREST GROUP POLITICS. (4 Credits)
Interest group formation, resources, strategies, and internal struggles, as well as group influence on elections and politics, in government and policy making, and in relation to democratic theory.

PS 315. *THE POLITICS OF MEDIA. (4 Credits)
Examination of the methods of operation, content and effects of the media in relation to politics and government. Includes analysis of newspaper, radio and television, political advertising, and other forms of political communication. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

PS 317. GENDER AND POLITICS. (4 Credits)
Analyzes the role that gender plays in shaping politics and other aspects of society. The course will cover theories of gender difference, gender-based movements, gender and political office, and gender and public policy. (SS)
Attributes: LACS – Liberal Arts Social Core

PS 321. CONSTITUTIONAL LAW: GOVERNMENT POWERS AND CONSTRAINTS. (4 Credits)
The role of the U.S. Supreme Court in shaping the powers and limitations of the U.S. government. The powers of the three main branches of our government, and cases where the powers of these branches clash with one another or with the powers of the states or rights of the individual.
PS 322. *CONSTITUTIONAL LAW: CIVIL RIGHTS AND LIBERTIES. (4 Credits)
Doctrines pertaining to the First, Second and Fourteenth Amendments, such as freedom of speech, of expression, of the press and of the exercise, the right to bear arms and the prohibition against governmental establishment of religion. Issues of discrimination and the reach of the 14th amendment's equal protection clause, and the right to privacy. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

PS 323. CONSTITUTIONAL LAW: RIGHTS OF THE ACCUSED. (4 Credits)
The role of the U.S. Supreme Court in shaping the powers and limitations of the U.S. government. The powers of the three main branches of our government, and cases where the powers of these branches clash with one another or with the powers of states or rights of the individual.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

PS 325. *GENDER AND THE LAW. (4 Credits)
Legal status of American women, with emphasis on constitutional law, the 1964 Civil Rights Act and its amendments, and various state laws as they relate to the legal rights of women. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

PS 326. JUDICIAL PROCESS AND POLITICS. (4 Credits)
Study of the operation, processes, behavior and influence of the state and federal judiciaries, as well as current research in the judiciary as it relates to politics.

PS 328. SPORTS AND POLITICS. (4 Credits)
Topics include: Sport's interactions with formal political institutions, sports law, sports in the international community, sports at the university, sports and gender, sports and labor politics, and sports and race.

PS 331. *STATE AND LOCAL POLITICS. (4 Credits)
Role, organization, and functions of government at the state and local level. Satisfies teaching certification requirement for course work in state and local government. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: PS 203

PS 341. *EUROPEAN AND EU POLITICS. (4 Credits)
Describes and analyzes the political situation in Europe and the European Union. Special focus is given to issues concerning European security and the European Union, its institutions, politics, and the challenges it faces since the opening of Europe to the East. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 342. THE POLITICS OF CORRUPTION. (4 Credits)
Surveys corruption and how it manifests itself in democracies and centralized states. Topics include theoretical accounts for why corruption occurs, what factors are conducive toward producing corruption, the consequences of corruption, and anti-corruption efforts that have succeeded and failed to rectify corruption.

PS 343. *RUSSIAN POLITICS. (4 Credits)
Brief survey of Russian politics in Tsarist and Soviet periods followed by extensive analysis of Russian politics in the late Soviet period under Gorbachev (1985-91), the collapse of the USSR in 1991, and post-Soviet Russian politics (1992-present). (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

PS 344. *LATIN AMERICAN POLITICS. (4 Credits)
The key political, social and economic issues in Latin America. Surveys topics of interest in the region such as economic development, democratization, revolution and political leadership from both an historical and contemporary perspective. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

PS 345. *POLITICS OF DEVELOPING NATIONS. (4 Credits)
Analyzes the concepts of development and modernization. Also focuses on the economic, political, and cultural problems faced by developing nations. (NC) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Equivalent to: PS 345H

PS 346. *MIDDLE EAST POLITICS. (4 Credits)
The comparative study of the Middle East and North Africa focusing on the internal political dynamics of countries in the region and the international relations among them. Examines issues of political and economic development in their post-colonial context and analyzes impact of nationalism, political Islam, ethnicity, and globalization. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PS 446

PS 348. *CHINESE POLITICS. (4 Credits)
Examines China's post-1949 political and economic development. Special attention is given to the reform era from the late 1970s to the present. The course also addresses the impact of the reforms on society and on the country's relationship with the world. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core

PS 349. *BRITISH POLITICS. (4 Credits)
The structure and operation of the British political system, the nature of the political parties and how the governing institutions of the British state have changed over time. The course will also consider how British politics impact upon the culture, politics and institutions of the United States. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture

PS 350. *JAPANESE POLITICS. (4 Credits)
Examination of the Japanese political system during the postwar period. Topics include prewar historical influences, political parties, bureaucracy, interest groups, policy processes and issues, political economy, foreign policy, and United States-Japan relations. Attention will also be given to recent dramatic changes in Japan's political system. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity

PS 351. AMERICAN FOREIGN POLICY. (4 Credits)
Overview of the role of the United States in the world since World War II and of the factors influencing the formation of American foreign policy. Equivalent to: PS 456

PS 354. *INTERNATIONAL ORGANIZATIONS AND GLOBAL POLITICS. (4 Credits)
The role of international law and organizations in global politics. How sovereign states interact, and what motivates them to commit to supranational laws and intergovernmental organizations. How international law has evolved since the early 1900s. Intergovernmental organizations and treaties, with emphasis on the United Nations, the International Monetary Fund and the World Bank, the World Trade Organization, the European Union, and the North Atlantic Treaty Organization. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 356. INTERNATIONAL POLITICS OF ASIA PACIFIC. (4 Credits)
Examines the most pressing issues facing the region: security and regional economic integration. The major players, their interests, and their differing perspectives on regional issues will be analyzed.
PS 361. CLASSICAL POLITICAL THOUGHT. (4 Credits)
Major political theorists from the pre-Socratics through the Scholastics.
(H)
Attributes: LACH – Liberal Arts Humanities Core
PS 362. MODERN POLITICAL THOUGHT. (4 Credits)
Major political theorists from the Renaissance to the mid-nineteenth century. (H)
Attributes: LACH – Liberal Arts Humanities Core
PS 363. *GENDER AND RACE IN AMERICAN POLITICAL THOUGHT. (4 Credits)
Traditional canon of American political thought scrutinized from vantage point of feminist and critical race theory scholarship. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PS 363H
PS 364. CONTEMPORARY POLITICAL THEORY. (4 Credits)
Major issues in contemporary political theory. The specific emphasis of the course may vary from term to term, focusing on questions related to theories of justice, theories of democracy, global political theory, or the work of a single important thinker.
PS 365. AMERICAN POLITICAL THOUGHT. (4 Credits)
Political values and theoretical systems in the American tradition, from the Puritans to the present.
PS 366. *FROM ATLANTIS TO UTOPIA: THE POLITICS OF THE IDEAL STATE. (4 Credits)
The search for the ideal state has occupied political philosophy since antiquity. From Plato’s Atlantis story through More’s utopia and beyond, philosophers, writers and filmmakers have pondered how to create a perfect state with perfect citizens which will stand the test of time. Each week will combine theoretical reflections from antiquity through post-modernity with a selection of examples from more or less contemporary fiction that will ideally already be known to the audience. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: PS 366H
PS 366H. *FROM ATLANTIS TO UTOPIA: THE POLITICS OF THE IDEAL STATE. (4 Credits)
The search for the ideal state has occupied political philosophy since antiquity. From Plato’s Atlantis story through More’s utopia and beyond, philosophers, writers and filmmakers have pondered how to create a perfect state with perfect citizens which will stand the test of time. Each week will combine theoretical reflections from antiquity through post-modernity with a selection of examples from more or less contemporary fiction that will ideally already be known to the audience. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: PS 366
PS 370. *SCIENCE, RELIGION, AND POLITICS. (4 Credits)
Addresses historical interplay between religion and science in Western culture, then focuses on the perceived conflicts between science and religion within American socio-political context; illustrates role of politics as the ‘playing field’ on which social differences contend; requires students to grapple with viewpoints that differ from their own. Team taught. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
PS 371. PUBLIC POLICY PROBLEMS. (4 Credits)
The content and the politics of adoption and application of such policy areas as defense, poverty and welfare, macroeconomics, and regulation.
PS 372. PUBLIC ADMINISTRATION. (4 Credits)
The workings of the modern administrative state, processes and procedures through which government acts, and the balance between powerful government, democratic and accountable government, and efficient government.
PS 374. *SUSTAINABLE LIVING: PRACTICES AND POLICIES. (4 Credits)
Exploration of the role individuals in sustainability practices and policies. Special focus is given to an examination of how individuals can make sustainable lifestyle choices in light of policy regulations, technologies, socio-economic conditions, and cultural values. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
PS 375. *THE CIVIL RIGHTS MOVEMENT AND POLICIES. (4 Credits)
Political and social evolution of the civil rights movement, emphasizing events 1954-1965, and major contemporary civil rights politics and policies in the South and the nation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PS 375H
PS 375H. *THE CIVIL RIGHTS MOVEMENT AND POLICIES. (4 Credits)
Political and social evolution of the civil rights movement, emphasizing events 1954-1965, and major contemporary civil rights politics and policies in the South and the nation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: PS 375
PS 399. CURRENT PROBLEMS IN POLITICS. (1-4 Credits)
Selected issues of recent American and international concern such as Vietnam, Central America, or similar topical issues. May be repeated for credit when topic varies.
Equivalent to: PS 399H
This course is repeatable for 16 credits.
PS 399H. CURRENT PROBLEMS IN POLITICS. (1-4 Credits)
Selected issues of recent American and international concern such as Vietnam, Central America, or similar topical issues. May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: PS 399
This course is repeatable for 16 credits.
PS 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
PS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.
PS 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.
PS 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: PS 405H
This course is repeatable for 16 credits.
PS 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PS 405
This course is repeatable for 16 credits.
PS 406. PROJECTS. (1-16 Credits)
Section 1-5: Reading. Associated with the internship for which credit is given in PS 410.
This course is repeatable for 16 credits.
PS 407. SEMINAR. (1-16 Credits)
Equivalent to: PS 407H
This course is repeatable for 16 credits.
PS 407H. SEMINAR. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PS 407
This course is repeatable for 16 credits.

PS 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PS 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

PS 410. POLITICAL SCIENCE INTERNSHIP. (1-12 Credits)
Supervised work experience in government- or law-related programs or other public affairs organizations. Reports and appraisals required. Only 4 credits may be applied to the major.
This course is repeatable for 12 credits.

PS 425. *GENDER AND THE LAW. (4 Credits)
Legal status of American women, with emphasis on constitutional law, the 1964 Civil Rights Act and its amendments, and various state laws as they relate to the legal rights of women. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PS 425H
Recommended: PS 201 or PS 326

PS 427. NUCLEAR NONPROLIFERATION AND ARMS CONTROL. (4 Credits)
Examines the history, politics and current challenges involving nuclear weapons proliferation and arms control.

PS 428. TERRORISM AND GLOBAL SECURITY. (4 Credits)

PS 441. DEMOCRATIZATION. (4 Credits)
Democratization and the factors that encourage and/or erode democratic stability. Political developments in a wide array of countries, with a particular focus on the unfolding events in the Middle East. Theories of what causes authoritarian regimes to collapse and what helps initially fragile democracies endure or collapse.

PS 446. EAST ASIAN POLITICAL ECONOMY. (4 Credits)
Surveys and analyzes the economic and political development of China, Japan, South Korea, Taiwan, Hong Kong, and Singapore. Japan is examined as a developmental model for the East Asian Newly Industrializing Countries (NICs) and as a major player in the regional economy. China is examined as a contrasting model in terms of its changing pattern of economic development and its importance for the region.
Equivalent to: PS 346

PS 449. *TOPICS IN COMPARATIVE POLITICS. (4 Credits)
Topics in comparative politics not covered in other courses. May be repeated for credit when topic varies. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

PS 454. INTERNATIONAL LAW AND ORGANIZATIONS. (4 Credits)
Theories and historical development of international law and organizations; the United Nations system.
Recommended: PS 204 or PS 205

PS 455. *THE POLITICS OF CLIMATE CHANGE. (4 Credits)
Covers domestic and international political aspects of global climate change. Topics include local, state, and national activity as well as roles played by presidents, Congress, the Supreme Court, corporations and media. International focus on conventions and treaties, tensions between developed and developing nations and possible national security impacts. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 457. US-CHINA RELATIONS. (4 Credits)
Equivalent to: PS 557

PS 458. *INTERNATIONAL POLITICAL ECONOMY. (4 Credits)
Examines topics in which politics and economics meet in the international arena, such as trade, debt, finance, development, multinational corporations, and globalization. Does not require a background in economics. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

PS 461. ENVIRONMENTAL POLITICAL THEORY. (4 Credits)
Examines the ways in which political theory enhances our understanding of environmental issues. Focuses on the political and philosophical premises of various environmental perspectives, and how different theories of justice and democracy address issues such as environmental racism, ecological justice, and global climate change.

PS 462. THEORIES OF LAW. (4 Credits)
Covers some of the main theories and approaches to the nature of law. What is law? What is its relation, if any, to morality? What is it that judges do? Questions such as these are explored through reading some of the classic works on the topic.

PS 470. GLOBAL FOOD POLITICS AND POLICY. (4 Credits)
Examines the politics and policy of global food systems as they relate to food distribution, production, and consumption. The cultivation and consumption of food is highly political, and at times, contentious. Specific focus is given to issues like social justice, GMOs, human health, environment and agribusiness.

PS 471. NUCLEAR POLITICS AND POLICY. (4 Credits)
Covers the political and policy implications of nuclear technology, including both nuclear weapons and civilian applications such as nuclear energy.

PS 473. US ENERGY POLICY. (4 Credits)
Addresses US energy policy with respect to how the U.S. governs the production and use of different energy sources, along with the management of its energy infrastructure. Examines policies currently in place, as well as proposals for alternatives, while examining the economic, environmental, national security and energy security implications of different policy approaches.

PS 475. ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Environmental and natural resource issues and policies in national and regional context, emphasizing public attitudes, elections, Congress, public policy, and relevant national and state agencies.

PS 476. *SCIENCE AND POLITICS. (4 Credits)
Relationship between science and the political system in political ideas and history, in bureaucratic politics of science policy, and in contemporary scientific disputes. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
PS 477. INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Analysis of international environmental theory and politics, the development of international environmental regimes, agreements and treaties, and the process of globalization and the quality of the environment.

PS 478. RENEWABLE ENERGY POLICY. (4 Credits)
Renewable energy policy with respect to how the U.S. governs the market development, production and use of different renewable energy sources are addressed.

PS 483. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 483, ES 483, WLC 483

PS 499. SPECIAL TOPICS. (1-16 Credits)
Selected topics in political science of special or current interest not covered in other courses. May be repeated for credit when topic varies. This course is repeatable for 99 credits.

PS 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Independent research project under supervision of graduate faculty. This course is repeatable for 16 credits.

PS 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PS 503. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

PS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PS 506. PROJECTS. (1-16 Credits)
Section 1-5: Reading. Associated with the internship for which credit is given in PS 410. Completion of this course is required to receive credit for PS 410. Section 11: MU Field Training, 3 credits. Section 12: ASOSU Field Training, 3 credits, each graded P/N. This course is repeatable for 16 credits.

PS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PS 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

PS 510. POLITICAL SCIENCE INTERNSHIP. (1-12 Credits)
Supervised work experience in government- or law-related programs or other public affairs organizations. Reports and appraisals required. This course is repeatable for 12 credits.

PS 527. NUCLEAR NONPROLIFERATION AND ARMS CONTROL. (4 Credits)
Examines the history, politics and current challenges involving nuclear weapons proliferation and arms control.

PS 528. TERRORISM AND GLOBAL SECURITY. (4 Credits)

PS 541. DEMOCRATIZATION. (4 Credits)
Democratization and the factors that encourage and/or erode democratic stability. Political developments in a wide array of countries, with a particular focus on the unfolding events in the Middle East. Theories of what causes authoritarian regimes to collapse and what helps initially fragile democracies endure or collapse.

PS 554. INTERNATIONAL LAW AND ORGANIZATIONS. (4 Credits)
Theories and historical development of international law and organizations; the United Nations system. Recommended: PS 204 or PS 205

PS 555. THE POLITICS OF CLIMATE CHANGE. (4 Credits)
Covers domestic and international political aspects of global climate change. Topics include local, state, and national activity as well as roles played by presidents, Congress, the Supreme Court, corporations and media. International focus on conventions and treaties, tensions between developed and developing nations and possible national security impacts.

PS 557. US-CHINA RELATIONS. (4 Credits)

PS 558. INTERNATIONAL POLITICAL ECONOMY. (4 Credits)
Examines topics in which politics and economics meet in the international arena, such as trade, debt, finance, development, multinational corporations, and globalization. Does not require a background in economics.

PS 561. ENVIRONMENTAL POLITICAL THEORY. (4 Credits)
Examines the ways in which political theory enhances our understanding of environmental issues. Focuses on the political and philosophical premises of various environmental perspectives, and how different theories of justice and democracy address issues such as environmental racism, ecological justice, and global climate change.

PS 562. THEORIES OF LAW. (4 Credits)
Covers some of the main theories and approaches to the nature of law. What is law? What is its relation, if any, to morality? What is it that judges do? Questions such as these are explored through reading some of the classic works on the topic.

PS 570. GLOBAL FOOD POLITICS AND POLICY. (4 Credits)
Examines the politics and policy of global food systems as they relate to food distribution, production, and consumption. The cultivation and consumption of food is highly political, and at times, contentious. Specific focus is given to issues like social justice, GMOs, human health, environment and agribusiness.

PS 573. US ENERGY POLICY. (4 Credits)
Addresses US energy policy with respect to how the U.S. governs the production and use of different energy sources, along with the management of its energy infrastructure. Examines policies currently in place, as well as proposals for alternatives, while examining the economic, environmental, national security and energy security implications of different policy approaches.

PS 575. ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Environmental and natural resource issues and policies in national and regional context, emphasizing public attitudes, elections, Congress, public policy, and relevant national and state agencies.
PS 576. SCIENCE AND POLITICS. (4 Credits)
Relationship between science and the political system in political ideas and history, in bureaucratic politics of science policy, and in contemporary scientific disputes.

PS 577. INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY. (4 Credits)
Analysis of international environmental theory and politics, the development of international environmental regimes, agreements and treaties, and the process of globalization and the quality of the environment.

PS 578. RENEWABLE ENERGY POLICY. (4 Credits)
Renewable energy policy with respect to how the U.S. governs the market development, production and use of different renewable energy sources are addressed.

PS 583. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 583, ES 583, WLC 583

PS 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 99 credits.

PS 808. WORKSHOP. (4 Credits)
Principles of public administration, administrative organization and procedures, public relations. It will include collaborative governance, leadership, and other issues.

Professional Science Masters (PSM)

PSM 506. PROJECTS. (1,16 Credits)
This course is repeatable for 99 credits.

PSM 507. SEMINAR. (1-16 Credits)
This course is repeatable for 99 credits.

PSM 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

Psychology (PSY)

PSY 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 201. *GENERAL PSYCHOLOGY. (3 Credits)
Scientific study of behavior and experience. Biological bases of behavior; sensation and perception; conditioning, learning and memory; thinking, problem solving, language, and consciousness; cognitive, personal and social development. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

PSY 202. *GENERAL PSYCHOLOGY. (3 Credits)
Motivation and emotion; personality; measurement of human differences; adjustment, psychopathology and psychotherapy; attitudes and social behavior. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core

PSY 298. QUANTITATIVE METHODS IN PSYCHOLOGICAL SCIENCE. (4 Credits)
Foundational course explores quantitative methods in psychological science to prepare students for further study in research methods in psychological science. Topics include descriptive statistics, hypothesis testing, correlation, one-way or two-way ANOVA, regression, controversies and emerging practices in open psychological science.
Prerequisites: PSY 201 with C- or better and (PSY 202 [C-] or PSY 202H [C-]) and MTH 105 [C-] and ST 201 [C-] and (PHL 121 [C-] or WR 222 [C-] or WR 327 [C-])

PSY 299. SPECIAL TOPICS. (0-6 Credits)
This course is repeatable for 30 credits.

PSY 301. RESEARCH METHODS IN PSYCHOLOGY. (4 Credits)
Study of scientific methodology in psychology, including experimental and observational techniques. Topics include problem identification and hypothesis formation, research design, application of statistics, collection and interpretation of data, computer usage, and research report writing. Lec/lab.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-] and (ST 351 [D-] or ST 351H [D-])

PSY 330. BRAIN AND BEHAVIOR. (4 Credits)
Introduction to the relationships of the structure and functioning of the human brain to behavior. Information from neuroanatomy, neurochemistry, neurosurgery and neurology is combined with psychological research on both normal and abnormal human behavior. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 340. COGNITION. (4 Credits)
Theories, research and applications concerning cognition. Topics include perception, attention, memory, learning, thinking and language. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 340H. COGNITION. (4 Credits)
Theories, research and applications concerning cognition. Topics include perception, attention, memory, learning, thinking and language.
Attributes: HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 350. HUMAN LIFESPAN DEVELOPMENT. (4 Credits)
An introduction to physical, social, cognitive and linguistic development with an emphasis on theory and methodology. (SS)
Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
PSY 360. SOCIAL PSYCHOLOGY. (4 Credits)
The study of behavior and experience in a social context. Topics include
person perception, attribution, attraction and love, attitudes and attitude
change, aggression, social influence and group dynamics. Applications of
social psychological principles to other fields, e.g., law, health care, etc.

Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 360

PSY 360H. SOCIAL PSYCHOLOGY. (4 Credits)
The study of behavior and experience in a social context. Topics include
person perception, attribution, attraction and love, attitudes and attitude
change, aggression, social influence and group dynamics. Applications of social psychological principles to other fields, e.g., law, health care, etc. (SS)

Attributes: HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 360

PSY 370. PERSONALITY. (4 Credits)
An overview of major theories of personality is followed by an
introduction to personality testing and research. (SS)

Attributes: LACS – Liberal Arts Social Core
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 370H

PSY 381. ABNORMAL PSYCHOLOGY. (4 Credits)
Survey of various forms of psychological disorders; theories regarding
etiology and treatment. Special emphasis on research approaches to
such disorders.

Prerequisites: PSY 201 with D- or better and PSY 202 [D-]
Equivalent to: PSY 381H

PSY 399. SPECIAL TOPICS. (1-6 Credits)
Equivalent to: PSY 399H
This course is repeatable for 30 credits.

PSY 399H. SPECIAL TOPICS. (1-6 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: PSY 399
This course is repeatable for 30 credits.

PSY 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 402. INDEPENDENT STUDY. (1-16 Credits)
Graded P/ N.
This course is repeatable for 16 credits.

PSY 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 406. PROJECTS. (0-16 Credits)
This course is repeatable for 16 credits.

PSY 407. SEMINAR. (1-16 Credits)
Graded P/ N.
This course is repeatable for 16 credits.

PSY 408. WORKSHOP. (1-16 Credits)
Graded P/ N.
This course is repeatable for 16 credits.

PSY 410. PSYCHOLOGY INTERNSHIP. (1-16 Credits)
Professional experience applying psychological science in a variety of
employment settings under joint faculty and employer supervision. Graded P/ N.
This course is repeatable for 16 credits.

PSY 426. PSYCHOLOGY OF GENDER. (4 Credits)
Survey of theories, life cycles and contemporary problems of women
and men in a social context. Scientific examination of gender related to
psychological functioning and behavior. Topics can include psychological
research on human similarities and differences in gender attitudes,
relationships, sexuality, violence, employment, and mental health. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Pow er/Discrimination
Prerequisites: PSY 202 with D- or better

PSY 432. PHYSIOLOGICAL PSYCHOLOGY. (4 Credits)
Basic vertebrate neurophysiology and neuroanatomy in relation to
behavior. Neural and hormonal correlates of sensation, learning, memory
and motivation.
Prerequisites: PSY 330 with D- or better
Recommended: Biological science background

PSY 433. PSYCHOPHARMACOLOGY. (4 Credits)
Drug-brain-behavior interactions. Psychoactive drugs and their
relationships to normal and abnormal behavior in humans.
Recommended: Upper-division standing and biological science
background

PSY 434. BRAIN AND BEHAVIOR METHODS. (4 Credits)
Methodology primarily in the area of neuropsychological research. Topics include the finding and interpretation of background literature, critical
evaluation of research, hypothesis formulation, experimental design,
data interpretation, reporting of results and methods, and weaving a
conclusion and review article. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and PSY 330 [D-]

PSY 437. MOTIVATION. (4 Credits)
Biological, learning, and cognitive approaches to human and animal
motivation. Topics include evolution, homeostasis, drive, arousal,
incentive motivation, achievement motivation, and social motivation.
Prerequisites: (PSY 330 with D- or better or PSY 340 with D- or better) and
PSY 301 [D-]

PSY 440. COGNITION RESEARCH. (4 Credits)
Advanced scientific methodology primarily in the areas of attention,
learning, memory, and thinking. Students will design their own research
projects, collect and analyze data, and write a professional report.
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]

PSY 442. PERCEPTION. (4 Credits)
Fundamental concepts of animal and human sensation and perception,
with emphasis on audition and vision. Applications of psychophysical
methods to research in all sensory modalities. Includes review workshops
on basic mathematical, physical and physiological concepts necessary to
interpret research in this field.
Prerequisites: PSY 301 with D- or better and (PSY 330 [D-] or PSY 340 [D-])

PSY 444. LEARNING AND MEMORY. (4 Credits)
Experimental and theoretical work on learning, conditioning, and memory
in animals and humans.
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]
PSY 448. CONSCIOUSNESS. (4 Credits)
Psychological, phenomenological, and physiological approaches to the content and processes of subjective awareness. Topics include philosophical issues, cortical and reticular neurophysiology, sleeping and dreaming, selective attention, imagery, and self-awareness.
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]

PSY 454. COGNITIVE DEVELOPMENT. (4 Credits)
Discusses intellectual development from infancy to adulthood. Topics include the origin of thinking, the development of perception, attention, memory, problem solving, language, academic skills, and social cognition. Piaget, Vygotsky, and information processing approaches will be discussed.
Prerequisites: PSY 350 with D- or better

PSY 456. SOCIAL DEVELOPMENT. (4 Credits)
Covers theories and research concerning human social development. Topics include theories of socialization; the development of social relationships; the self-concept; emotion; sex roles; social cognition; pro-social behavior; morality; self-control; and aggression.
Prerequisites: PSY 350 with D- or better

PSY 458. LANGUAGE ACQUISITION. (4 Credits)
Psychological processes involved in the acquisition and use of language throughout childhood. Biological, cognitive, and social influences on language will be discussed, as well as personal uses of language, such as language in thought and reading.
Prerequisites: PSY 350 with D- or better

PSY 460. ^ADVANCED SOCIAL RESEARCH METHODS. (4 Credits)
Advanced experimental research methods in the social sciences. Issues in psychological construct operationalization, experimental design, data collection, analysis, and report writing will be emphasized. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and PSY 360 [D-]

PSY 463. JUDGMENT AND DECISION MAKING. (4 Credits)
Explores ways to improve judgment and decision making through the application of research from cognitive psychology. Emphasis on development of critical thinking skills.
Prerequisites: PSY 340 with D- or better

PSY 464. SOCIAL COGNITION. (4 Credits)
Research and theory concerning cognitive structures and processes underlying social judgment and social behavior. Topics include attribution theory, social inference, person memory, schema-based information processing.
Prerequisites: PSY 360 with D- or better

PSY 465. WOMEN, WEIGHT, AND BODY IMAGE. (4 Credits)
Focuses on women's increasing struggles with weight, eating disorders, and broader body image issues in contemporary society. Explores how social institutions such as media, medicine, government contribute to weight bias and unhealthy standards for appearance. Examines weightism as a system of oppression that intersects with other systems of oppression including sexism, racism, classism, heterosexism, ableism, and ageism. CROSSLISTED as PSY 465/WGSS 465 and PSY 565.
Equivalent to: WGSS 465

PSY 466. ^FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employs a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/PowereDiscrimination
Prerequisites: WGSS 223 with D- or better or WGSS 223H with D- or better or WGSS 240 with D- or better or WGSS 262 with D- or better or WGSS 262H with D- or better or WGSS 270 with D- or better or WGSS 280 with D- or better or WGSS 280H with D- or better or WGSS 321 with D- or better or WGSS 325 with D- or better or WGSS 325H with D- or better or WGSS 340 with D- or better or WGSS 340H with D- or better or WGSS 350 with D- or better or WGSS 360 with D- or better or WGSS 360H with D- or better or WGSS 364 with D- or better or WGSS 364H with D- or better or WGSS 373 with D- or better or WGSS 375 with D- or better or WGSS 380 with D- or better or WGSS 380H with D- or better
Equivalent to: WGSS 466, WS 466

PSY 467. POLITICAL PSYCHOLOGY. (4 Credits)
Survey of classic and contemporary perspectives in political psychology. Special focus on how citizens form political judgments. Topics include personality, affect, cognition, group influence, voting, nationalism, and political tolerance.
Prerequisites: PSY 360 with D- or better

PSY 468. THE PSYCHOLOGY OF CLOSE RELATIONSHIPS. (4 Credits)
Explores the research and theory on the development, maintenance, and dissolution of human relationships. The course will examine various directions to the study of interpersonal relationships, including attachment, evolutionary-biological, cognition, and interdependence. Topics will also include physical attraction, love, friendship, communication, trust, jealousy, and several issues that are specific to troubled dyadic relations.
Prerequisites: PSY 360 with D- or better

PSY 470. ^PSYCHOMETRICS AND PSYCHOLOGICAL TESTING. (4 Credits)
An introduction to psychological measurement is provided with emphasis on the notions of reliability and validity; advanced correlation techniques are introduced. These methods are applied to contemporary tests of personality, aptitude, and achievement. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and (PSY 340 [D-] or PSY 370 [D-] or PSY 380 [D-] or PSY 381 [D-] or PSY 481 [D-])

PSY 480. ^CLINICAL RESEARCH METHODS. (4 Credits)
Advanced research methods used in clinical psychology research. Design of studies, assessment, data collection, and interpretation will be discussed. The clinical content area focused on will vary. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: PSY 301 with D- or better and (PSY 340 [D-] or PSY 370 [D-] or PSY 380 [D-] or PSY 381 [D-] or PSY 481 [D-])

PSY 482. PSYCHOTHERAPY. (4 Credits)
Survey of the theory, techniques and research on the major contemporary systems of psychotherapy.
Prerequisites: PSY 370 with D- or better or PSY 380 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better
PSY 483. DEVELOPMENTAL PSYCHOPATHOLOGY. (4 Credits)
Developmental perspective on child and adolescent psychological disorders including causal factors, associated features, and research-supported interventions.
Prerequisites: PSY 350 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better

PSY 484. *PSYCHOLOGY OF ADDICTION. (4 Credits)
Focuses on the psychological factors in drug and behavioral addictions and associated interventions. The approach will be biopsychosocial, addressing neurobiological, behavioral, psychological, and social factors that influence addiction. Topics will include epidemiology and public health impact, diagnosis, models of addiction, and intervention and treatment approaches.
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 220 with C- or better or PSY 301 with C- or better or SOC 315 with C- or better

PSY 485. BEHAVIOR MODIFICATION. (4 Credits)
Review of basics of operant and classical conditioning. Research on behavior modification and behavior therapy with both normal and abnormal animals, human adults, and children. Application areas include behavior problems, handicaps, eating disorders, time management, self-control stress management, contingency contracts, and cognitive therapies.
Prerequisites: PSY 350 with D- or better or PSY 380 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better
Recommended: Background work in family life or education

PSY 486. YOGA AND MENTAL HEALTH. (4 Credits)
Examines the use of yoga in psychological practice with a particular focus on managing mental and physical illnesses.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 492. CONSERVATION PSYCHOLOGY. (4 Credits)
Explores connections between the study of human behavior and the achievement of conservation goals. Understanding how people think about and interact with nature is crucial for promoting environmental sustainability and human well-being. Students will examine theory and research on human cognitive, emotional, and behavioral responses to nature.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 493. POSITIVE PSYCHOLOGY. (4 Credits)
Psychological theory, research, and interventions directed at how humans can flourish and identify and enhance positive strengths. Topics include positive emotional and cognitive states and processes, prosocial behavior, positive school and work environments, and discovering meaning in life.
Prerequisites: PSY 360 with D- or better or PSY 370 with D- or better

PSY 494. ENGINEERING PSYCHOLOGY. (4 Credits)
Survey human capabilities and limitations in human-machine interaction, including vision, memory, attention, motor control, and human error. Emphasis on theory and implications for system designs.
Prerequisites: PSY 301 with D- or better and PSY 340 [D-]

PSY 495. PSYCHOLOGY OF MEDITATION. (4 Credits)
Explores the psychological processes of meditation, and requires regular meditation sessions by students. Readings ranging from traditional Eastern philosophy to empirical psychological research journal articles will focus on outcomes and effective methods of meditation practice.
Prerequisites: PSY 201 with D- or better or PSY 202 with D- or better

PSY 496. INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY. (4 Credits)
Survey of psychological research and theory relevant to organizations, industry, and other work settings. Topics include training, employee selection, performance evaluation, work attitudes, and motivation.
Prerequisites: PSY 360 with D- or better or PSY 370 with D- or better

PSY 497. EVOLUTIONARY PSYCHOLOGY. (4 Credits)
Evolutionary approach to the study of psychology. Focus on psychological mechanisms as evolved traits.
Prerequisites: PSY 201 with D- or better and PSY 202 [D-]

PSY 498. HEALTH PSYCHOLOGY. (4 Credits)
Psychological factors in the maintenance of good health and in the prevention of, treatment of, and recovery from illness: Behavioral contributions to illness, life-style risk factors, stress and the immune system, psychological response to symptoms and care-givers, health habits and self-care, management of pain and chronic illness, disability and terminal illness.
Prerequisites: PSY 330 with D- or better or PSY 340 with D- or better or PSY 350 with D- or better or PSY 360 with D- or better or PSY 370 with D- or better or PSY 381 with D- or better or PSY 481 with D- or better

PSY 499. SPECIAL TOPICS. (1-16 Credits)
Newly emerging or specialized topics that can only be offered occasionally or for particular purposes. Each offering will be structured with a syllabus.
Equivalent to: PSY 422, PSY 499H
This course is repeatable for 30 credits.

PSY 499H. SPECIAL TOPICS. (1-16 Credits)
Newly emerging or specialized topics that can only be offered occasionally or for particular purposes. Each offering will be structured with a syllabus.
Attributes: HNRS – Honors Course Designator
Equivalent to: PSY 499

PSY 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 502. INDEPENDENT STUDY. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

PSY 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 508. WORKSHOP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

PSY 510. PSYCHOLOGY INTERNSHIP. (1-16 Credits)
Professional experience applying psychological science in a variety of employment settings under joint faculty and employer supervision. Graded P/N.
This course is repeatable for 16 credits.
PSY 514. RESEARCH METHODS I. (4 Credits)
An introduction to the tools and methods that psychologists use to examine the processes that underlie human behavior. Emphasis is on the skills necessary for completing a research study: hypothesis formulation, design criteria, data collection, analysis, interpretation, write-up, and presentation of results. Utilizes a combination of readings, discussions, and class exercises. Course culminates in an independent research project proposal.
Prerequisites: ST 511 with B- or better

PSY 521. ISSUES IN PROFESSIONAL PSYCHOLOGY. (1 Credit)
Professional development seminar focused on professional issues specific to the field of research-based psychology. Includes writing for publication, professional speaking, professional development and leadership, and current professional and research controversies. Each iteration of the course over the academic year will have a different focus. Graded P/N. This course is repeatable for 3 credits.

PSY 523. ETHICS IN PSYCHOLOGICAL RESEARCH. (1 Credit)
Covers research ethics in psychology. Topics include the history of research-oriented ethical guidelines, ethical principles, working with an IRB, questionable research practices, and fraud. Meets OSU's Learning Outcome regarding the ethical conduct of research.
Recommended: An undergraduate-level psychological research methods course

PSY 526. PSYCHOLOGY OF GENDER. (4 Credits)
Survey of theories, life cycles and contemporary problems of women and men in a social context. Scientific examination of gender related to psychological functioning and behavior. Topics can include psychological research on human similarities and differences in gender attitudes, relationships, sexuality, violence, employment, and mental health.
Recommended: PSY 202

PSY 531. GRADUATE BEHAVIORAL NEUROSCIENCE. (4 Credits)
Neurobiological underpinnings of behavior examining animal and human research on neural structure and function in relation to typical and atypical behavior, including psychiatric disorders.

PSY 533. PSYCHOPHARMACOLOGY. (4 Credits)
Drug-brain-behavior interactions. Psychoactive drugs and their relationships to normal and abnormal behavior in humans.
Recommended: Biological science background

PSY 534. BRAIN AND BEHAVIOR METHODS. (4 Credits)
Methodology primarily in the area of neuropsychological research. Topics include the finding and interpretation of background literature, critical evaluation of research, hypothesis formulation, experimental design, data interpretation, reporting of results and methods, and weaving a conclusion and review article.
Recommended: PSY 301 and PSY 330

PSY 537. MOTIVATION. (4 Credits)
Biological, learning, and cognitive approaches to human and animal motivation. Topics include evolution, homeostasis, drive, arousal, incentive motivation, achievement motivation, and social motivation.
Recommended: PSY 301 and (PSY 330 or PSY 340)

PSY 540. COGNITION RESEARCH. (4 Credits)
Advanced scientific methodology primarily in the areas of attention, learning, memory, and thinking. Students will design their own research projects, collect and analyze data, and write a professional report.
Recommended: PSY 301 and PSY 340

PSY 541. GRADUATE SEMINAR IN COGNITION. (4 Credits)
Cognitive psychology studies the processes by which human beings notice, encode, remember, and use information. A graduate-level survey that covers the history, methods, important findings, and major theories of the field, with an emphasis on reading and critically analyzing articles from the primary research literature. Topics of interest will include perception and object recognition, attention, working memory, long-term memory, concepts and categorization, and judgment and decision making.

PSY 542. PERCEPTION. (4 Credits)
Fundamental concepts of animal and human sensation and perception, with emphasis on audition and vision. Applications of psychophysical methods to research in all sensory modalities. Includes review workshops on basic mathematical, physical and physiological concepts necessary to interpret research in this field.
Recommended: PSY 301 and (PSY 330 or PSY 340)

PSY 544. LEARNING AND MEMORY. (4 Credits)
Experimental and theoretical work on learning, conditioning, and memory in animals and humans.
Recommended: PSY 301 and PSY 340

PSY 548. CONSCIOUSNESS. (4 Credits)
Psychological, phenomenological, and physiological approaches to the content and processes of subjective awareness. Topics include philosophical issues, cortical and reticular neurophysiology, sleeping and dreaming, selective attention, imagery, and self-awareness.
Recommended: PSY 301 and PSY 340

PSY 551. LIFESPAN DEVELOPMENTAL SCIENCE. (4 Credits)
The study of human change and stability over time. Topics may include, but are not limited to, theories, methodological approaches, and contexts for developmental research, cognitive development, and biopsychosocial processes including temperament and personality, resilience, health, thriving, emotion regulation, and developmental contexts.

PSY 554. COGNITIVE DEVELOPMENT. (4 Credits)
Discusses intellectual development from infancy to adulthood. Topics include the origin of thinking, the development of perception, attention, memory, problem solving, language, academic skills, and social cognition. Piaget, Vygotsky, and information processing approaches will be discussed.
Recommended: PSY 350

PSY 556. SOCIAL DEVELOPMENT. (4 Credits)
Covers theories and research concerning human social development. Topics include theories of socialization, the development of social relationships; the self-concept; emotion; sex roles; social cognition; prosocial behavior; morality; self-control; and aggression.
Recommended: PSY 350

PSY 558. LANGUAGE ACQUISITION. (4 Credits)
Psychological processes involved in the acquisition and use of language throughout childhood. Biological, cognitive, and social influences on language will be discussed, as well as personal uses of language, such as language in thought and reading.
Recommended: PSY 350

PSY 560. ADVANCED SOCIAL RESEARCH METHODS. (4 Credits)
Advanced experimental research methods in the social sciences. Issues in psychological construct operationalization, experimental design, data collection, analysis, and report writing will be emphasized.
Recommended: PSY 301 and PSY 360
PSY 561. GRADUATE SOCIAL PSYCHOLOGY. (4 Credits)
A graduate level survey course of the theories, methods, and empirical findings that constitute the field of social psychology. Topics will include, but not be limited to, person perception, social cognition, attitudes, attitude change, persuasion, interpersonal attraction, relationships, small-group processes, altruism, and aggression.

PSY 564. SOCIAL COGNITION. (4 Credits)
Research and theory concerning cognitive structures and processes underlying social judgment and social behavior. Topics include attribution theory, social inference, person memory, schema-based information processing.
Recommended: PSY 360

PSY 565. WOMEN, WEIGHT, AND BODY IMAGE. (4 Credits)
Focuses on women's increasing struggles with weight, eating disorders, and broader body image issues in contemporary society. Explores how social institutions such as media, medicine, government contribute to weight bias and unhealthy standards for appearance. Examines weightism as a system of oppression that intersects with other systems of oppression including sexism, racism, classism, heterosexism, ableism, and ageism. CROSSLISTED as PSY 465/WGSS 465 and PSY 565.
Equivalent to: WGSS 565

PSY 566. FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employs a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566.
Equivalent to: WGSS 566, WS 566
Recommended: WGSS 223 or WGSS 223H or WGSS 224 or WGSS 240 or WGSS 262 or WGSS 262H or WGSS 270 or WGSS 280 or WGSS 280H or WGSS 321 or WGSS 325 or WGSS 325H or WGSS 340 or WGSS 340H or WGSS 350 or WGSS 360 or WGSS 360H or WGSS 364 or WGSS 364H or WGSS 373 or WGSS 375 or WGSS 380 or WGSS 380H

PSY 567. POLITICAL PSYCHOLOGY. (4 Credits)
Survey of classic and contemporary perspectives in political psychology. Special focus on how citizens form political judgments. Topics include personality, affect, cognition, group influence, voting, nationalism, and political tolerance.

PSY 570. PSYCHOMETRICS AND PSYCHOLOGICAL TESTING. (4 Credits)
An introduction to psychological measurement is provided, with emphasis on the notions of reliability and validity; advanced correlational techniques are introduced. These methods are applied to contemporary tests of personality, aptitude, and achievement.
Recommended: PSY 301 and (PSY 340 or PSY 370)

PSY 571. GRADUATE PSYCHOMETRICS. (4 Credits)
A graduate level introduction to psychological testing theory and practice, and to ethical, sociopolitical, psychological, and psychometric issues in the use of psychological tests. Particularly emphasizes basic psychometric principles that are important in scale construction, test evaluation, and practical assessment.
Prerequisites: ST 511 with B- or better and ST 512 [B-]

PSY 580. CLINICAL RESEARCH METHODS. (4 Credits)
Advanced research methods used in clinical psychology research. Design of studies, assessment, data collection, and interpretation will be discussed. The clinical content area focused on will vary.
Recommended: PSY 301 and (PSY 380 or PSY 381 or PSY 481)

PSY 581. GRADUATE SEMINAR IN CLINICAL RESEARCH AND THEORY. (4 Credits)
Focuses on major concepts, theory, and empirical findings on the causes and treatment of psychological disorders. The seminar emphasizes culture, context, bias, and stigma, as well as application of principles of clinical science to students' graduate program research agendas.

PSY 582. PSYCHOTHERAPY. (4 Credits)
Survey of the theory, techniques and research on the major contemporary systems of psychotherapy.
Recommended: PSY 370 or PSY 381

PSY 583. DEVELOPMENTAL PSYCHOPATHOLOGY. (4 Credits)
Developmental perspective on child and adolescent psychological disorders including causal factors, associated features, and research-supported interventions.
Recommended: PSY 350 or PSY 381 or PSY 481

PSY 584. PSYCHOLOGY OF ADDICTION. (4 Credits)
Focuses on the psychological factors in drug and behavioral addictions and associated interventions. The approach will be biopsychosocial, addressing neurobiological, behavioral, psychological, and social factors that influence addiction. Topics will include epidemiology and public health impact, diagnosis, models of addiction, and intervention and treatment approaches.

PSY 585. BEHAVIOR MODIFICATION. (4 Credits)
Review of basics of operant and classical conditioning. Research on behavior modification and behavior therapy with both normal and abnormal animals, human adults, and children. Application areas include: behavior problems, handicaps, eating disorders, time management, self-control, stress management, contingency contracts, and cognitive therapies.
Recommended: PSY 350 or equivalent work in family life or education.

PSY 586. YOGA AND MENTAL HEALTH. (4 Credits)
Examines the use of yoga in psychological practice with a particular focus on managing mental and physical illnesses.
Recommended: PSY 201 and PSY 202

PSY 591. GRADUATE SEMINAR IN HEALTH PSYCHOLOGY. (4 Credits)
Covers the theories, methods, and empirical findings that constitute the field of health psychology. Topics include, but are not limited to, the interaction of multiple factors involved in etiology, prevention, treatment, and course of illness and disability; health behavior, health promotion, and health risks; stress and coping in health; long-term care and adaptation to chronic illness or disability; practice of institutional healthcare.

PSY 592. CONSERVATION PSYCHOLOGY. (4 Credits)
Explores connections between the study of human behavior and the achievement of conservation goals. Understanding how people think about and interact with nature is crucial for promoting environmental sustainability and human well-being. Students will examine theory and research on human cognitive, emotional, and behavioral responses to nature.
Recommended: PSY 201 and PSY 202

PSY 593. POSITIVE PSYCHOLOGY. (4 Credits)
Psychological theory, research, and interventions directed at how humans can flourish and identify and enhance positive strengths. Topics include positive emotional and cognitive states and processes, prosocial behavior, positive school and work environments, and discovering meaning in life.
Recommended: PSY 360 or PSY 370
PSY 594. ENGINEERING PSYCHOLOGY. (4 Credits)
Survey human capabilities and limitations in human-machine interaction, including vision, memory, attention, motor control, and human error. Emphasis on theory and implications for system designs. Recommended: (PSY 301 and PSY 340)

PSY 595. PSYCHOLOGY OF MEDITATION. (4 Credits)
Explores the psychological processes of meditation, and requires regular meditation sessions by students. Readings ranging from traditional Eastern philosophy to empirical psychological research journal articles will focus on outcomes and effective methods of meditation practice. Recommended: PSY 201 and PSY 202

PSY 596. INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY. (4 Credits)
Survey of psychological research and theory relevant to organizations, industry, and other work settings. Topics include training, employee selection, performance evaluation, work attitudes, and motivation. Recommended: PSY 360 and PSY 370

PSY 598. HEALTH PSYCHOLOGY. (4 Credits)
Psychological factors in the maintenance of good health and in the prevention of, treatment of, and recovery from illness: Behavioral contributions to illness, lifestyle risk factors, stress and the immune system, psychological response to symptoms and care-givers, health habits and self-care, management of pain and chronic illness, disability and terminal illness. Recommended: 300-level course in psychology.

PSY 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

PSY 601. RESEARCH. (1-16 Credits)
Research credits for PhD students in Psychological Science. Graded P/N. This course is repeatable for 99 credits.

PSY 602. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 603. THESIS/DISSERTATION. (1-16 Credits)
Graded P/N. This course is repeatable for 999 credits.

PSY 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 606. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

PSY 643. APPLIED COGNITION. (4 Credits)
Surveys a range of applied cognition research in real-world settings, including aviation, driving, business, education, sports, legal practice, and everyday activities.

PSY 649. ADVANCED ENGINEERING PSYCHOLOGY. (4 Credits)
Advanced survey of human information processing and performance in human-technology systems, with emphasis on theory, methodology, and implications for system analysis and design.

PSY 697. GRADUATE PSYCHOLOGICAL SCIENCE OF TEACHING AND LEARNING. (4 Credits)
For graduate students of all majors on the translation of cognitive, social, and developmental psychological science for the practice of university teaching and learning. Topics include memory, attention, metacognition, motivation, interpersonal and developmental processes, and individual differences. Emphasis on critical review of theories and methods, and practical applications for university teaching.

PSY 699. SPECIAL TOPICS. (1-16 Credits)
Special topics for advanced graduate students. Graded A-F. This course is repeatable for 99 credits.

Public Health (H)
Additional public health courses can be found under HHS.

H 100. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy. Equivalent to: H 100H

H 100H. INTRODUCTION TO PUBLIC HEALTH. (4 Credits)
A basic overview of public health. Uses a mix of lectures, guest speakers, classroom activities and homework to help students understand the role of public health in eliminating health disparities, understanding epidemics, and setting policy. Attributes: HNRS – Honors Course Designator Equivalent to: H 100

H 199. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

H 201. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 206. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 210. *INTRODUCTION TO THE HEALTH CARE SYSTEM. (3 Credits)
Provides tools to understand and critically assess the health care delivery system, its components, and the challenges created by its structure. The health care system will be considered from the perspective of several main players [e.g., patients, hospitals, doctors, health plans]. (Bacc Core Course) Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 220. INTRODUCTION TO HEALTH DATA ANALYSIS. (3 Credits)
Introduction to the application of biostatistics and probability to the health sciences. Topics include quantitative analysis and inference, statistical methods in the biosciences, and quantitative study to evaluate and control health problems. Recommended: MTH 105 or MTH 111 or higher mathematics.

H 225. *SOCIAL AND INDIVIDUAL HEALTH DETERMINANTS. (4 Credits)
Overview of the macro (social/system/environmental) and micro (individual) contributors to premature disease, disability and population health. Selected behavioral theories supporting health risks and strategies for the prevention of premature disease/disability and the promotion of health. (Bacc Core Course) Attributes: CPSI – Core, Pers, Soc Proc & Inst
H 250. INTRODUCTION TO HEALTH CARE MANAGEMENT. (3 Credits)
Participants will learn key principles, practices and personalities of health care management. The content is broadly applicable to health care enterprises of every kind: public health organizations, physician practices and clinics, hospitals and health systems, agencies and service organizations, for-profit firms, not-for-profit enterprises, etc.
Prerequisites: H 210 (may be taken concurrently) with C- or better

H 309. PRACTICUM IN HEALTH CARE SERVICES. (3-6 Credits)
Supervised work experience in a health care service setting or health-related agency or program. Weekly progress reports and post-experience summary report and evaluation will be expected. Preplanned with instructor approval. Open to health care administration majors. Graded P/N.
This course is repeatable for 12 credits.

H 310. HEALTH FIELD EXPERIENCES. (3-6 Credits)
Introductory field experience in a health or health-related worksite. Graded P/N.
Prerequisites: H 210 with C- or better
This course is repeatable for 12 credits.

H 312. * HIV/AIDS AND STIS IN MODERN SOCIETY. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of AIDS and other sexually transmitted diseases in contemporary society; emphasis on social, psychological, legal, economic, and ethical issues surrounding these diseases. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: H 312H

H 319. INTRODUCTION TO HEALTH POLICY. (3 Credits)
Describe policy development process, including problem conceptualization, agenda setting, role of interest groups and public opinion, analysis of alternatives and selection of policy alternative.
Prerequisites: H 210 with C- or better and PS 201 [C-]

H 320. INTRODUCTION TO HUMAN DISEASE. (3 Credits)
Fundamental principles relating to etiology, nature, prevention, and control of communicable and noncommunicable diseases in human populations. Special emphasis on disease prevention and health promotion in the high risk diseases of modern, industrialized society.

H 333. * GLOBAL PUBLIC HEALTH. (3 Credits)
Introduction to the field of global health, its history, methods, and key principles; understanding global health inequities through case studies; overview of major global health prevention programs. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

H 344. *FOUNDATIONS OF ENVIRONMENTAL HEALTH. (3 Credits)
Introductory course examining environmentally-linked disease, and health effects associated with toxic substances, food quality, pesticides, air, water, and noise pollution, and solid/hazardous wastes.

H 349. PEER HELPER SKILLS DEVELOPMENT. (3 Credits)
Prepares the student for an active role as a peer helper in alcohol and drug abuse prevention and health education. Course work will include: drug, alcohol, addiction and other related health issues, basic listening and communication skills, conflict resolution, crisis recognition and referral. A major component will be affective learning situations designed to promote self-awareness and personal growth.

H 364. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation, decision-making, and self-responsibility in treatment and educational approaches to prevention.
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364H

H 364H. DRUGS, SOCIETY AND HUMAN BEHAVIOR. (3 Credits)
Drug use and abuse; theories of addiction; basic principles of drug action regarding the use of sedative and stimulative compounds; alcohol; opiates; hallucinogens; designer drugs; cocaine; and over-the-counter products. Particular emphasis on the role of the individual's value orientation.
Attributes: HNRS – Honors Course Designator
Prerequisites: PSY 201 with C- or better or PSY 202 with C- or better
Equivalent to: H 364

H 376. EVIDENCE-BASED HEALTH PROMOTION. (3 Credits)
Future health professionals will learn what makes a successful health promotion program. Students will learn about research-tested programs that are effective for promoting health in community, clinical, and educational settings. Participants will critically examine evidence in the field and select programs to address the current public health issues.
Prerequisites: H 100 with C- or better and H 225 [C-]

H 385. SAFETY AND HEALTH STANDARDS AND LAWS. (3 Credits)
Emphasis on the Occupational Safety and Health Act; study includes the scope and duties under the act, enforcement, and adjudication procedures and OSHA litigation; components of Oregon-OSHA.

H 388. *GLOBAL ENVIRONMENTAL HEALTH. (3 Credits)
An overview of global environmental issues, including climate change, air pollution, water, e-waste, and metals, and their impacts on human health. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues

H 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

H 399H. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

H 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

H 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

H 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
H 407. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world. 
Equivalent to: H 407H
Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option

H 407H. SEMINAR. (2 Credits)
Seminar to prepare students for their internship in public health. Focus is on professionalism, leadership skills, identifying strengths, and transitioning from college to graduate school or the working world.
Attributes: HNRS – Honors Course Designator
Equivalent to: H 407
Recommended: H 480 for students in EOH (Environmental and Occupational Health) minors. H 250 for students in the HMP (Health Management and Policy) option. H 225 and H 320 for students in the HPHB (Health Promotion and Health Behavior) option

H 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 409. PRACTICUM. (1-6 Credits)
Supervised work experience in a public health or health care administration setting. Open to majors in public health. Graded P/N. This course is repeatable for 16 credits.

H 410. INTERNSHIP. (1-12 Credits)
Directed field experience with participation in a community, worksite, or health agency program. Experience is individually arranged to meet student needs. Graded P/N.
Prerequisites: H 407 with C- or better
This course is repeatable for 24 credits.
Recommended: H 436 (for HMP students). H 225 and H 320 and H 476 (for HPHB students)

H 418. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Current ethical issues in public health, including gender and ethnicity in employment, pharmaceutical controls, product liability, advertising, and export of high technology.

H 421. MENTAL HEALTH. (3 Credits)
Examination of social, governmental, legal and individual mental health issues. Brief overview of some major mental disorders.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 422. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging.
Recommended: 9 credits of health course work.

H 425. FOUNDATIONS OF EPIDEMIOLOGY. (3 Credits)
Measures of disease frequency; measures of effect; association and causation; sources of inaccuracy; experimental and observational study designs. Lec/rec.
Prerequisites: H 220 with C- or better or ST 201 with C- or better or ST 314 with C- or better or ST 351 with C- or better

H 431. HEALTH CARE MARKETING. (3 Credits)
Principles, elements and methods of marketing health care services. Role of the consumer, governing body, administration and medical staff as well as impact of professional ethics.

H 432. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economic principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.
Prerequisites: (ECON 201 with C- or better or ECON 201H with C- or better) and H 210 [C-]

H 434. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 210 with C or better and H 250 [C-] and WR 222 [C-]

H 436. ADVANCED TOPICS IN HEALTH CARE MANAGEMENT. (3 Credits)
Covers how health services are governed and organized; how health care organizations assess and adapt to change; constraints/opportunities in shaping organizational performance; leadership; strategic decision-making and the use of evidence-based management in health care.
Prerequisites: H 210 with C- or better and H 250 [C-]

H 445. OCCUPATIONAL HEALTH. (3 Credits)
Current and historical topics in the area of occupational health, with particular emphasis on the types of materials that produce human health effects; clinical and epidemiologic data used to assess the public health importance of occupational polluants and to evaluate control strategies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

H 448. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Prerequisites: H 344 with C- or better
Recommended: One term of basic chemistry

H 449. MASS MEDIA AND HEALTH. (3 Credits)
Designed to examine the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public-health campaigns.
Prerequisites: H 225 with C- or better and H 320 [C-]

H 457. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Prerequisites: BA 215 with C- or better and H 210 [C-] and H 250 [C-]

H 458. REIMBURSEMENT MECHANISMS. (3 Credits)
Introduces and analyzes the different types of healthcare reimbursement methodologies used in the U.S. health care system.
Prerequisites: H 210 with C- or better

H 461. SEXUALITY: A HEALTH SCIENCE PERSPECTIVE. (3 Credits)
Exploration of the meaning of sexuality from a variety of contemporary health science perspectives; aspects of sex and sexuality fundamental to total health; issues central to the health educator role examined.
H 465. *PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women’s health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Recommended: 6 credits in public health.

H 467. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 468. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 474. PUBLIC HEALTH AND VIOLENCE IN SOCIETY. (3 Credits)
Examination of violence as a major public health issue. Historical, social, environmental, economic, behavioral and psychological aspects of assaultive violence, spousal abuse, rape and sexual assault, child abuse, child sexual abuse, suicide, the effects of the media on violence, drug abuse and violence, and related public health problems in contemporary American society. Emphasis on health and the efficacy of current efforts aimed at ameliorating these problems and potential for alternative public health models for prevention and intervention.

H 476. PLANNING AND EVALUATING HEALTH PROMOTION PROGRAMS. (4 Credits)
A systematic approach to planning, implementing and evaluating health promotion programs in a variety of health related settings. Students will be writing a series of drafts to effectively develop a health promotion program plan. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: H 225 with C- or better and H 320 [C-]

H 477. DIETARY INTERVENTIONS FOR PUBLIC HEALTH. (3 Credits)
A public health perspective on the practice of population-based dietary intervention. Examination of relevant theories, research, and practice that pertain to health promoters/educators.
Prerequisites: NUTR 225 with C- or better
Equivalent to: NUTR 477

H 480. UNDERGRADUATE EOH SEMINAR. (1 Credit)
Explores current topics in environmental health and safety. EOH faculty will discuss their current research interests; EOH graduate student speakers will share their environmental health and safety internship experiences. Documentaries will be viewed to introduce topics of discussion. Features will be discussions relating directly to ongoing, current environmental/occupational health crises, both in the United States and around the world. Graded P/N.
This course is repeatable for 2 credits.

H 489. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.
H 513. INTEGRATED APPROACH TO PUBLIC HEALTH. (12 Credits)
An integrated approach to introduce students to the core knowledge and methods used in public health, including evidence-based approaches to public health, public health and health care systems, planning and management to promote health, and policy in public health.

H 514. ENVIRONMENT, SAFETY AND HEALTH SEMINAR. (1 Credit)
One-credit graduate seminar on current topics of interest and importance to the environmental health and occupational safety field. Critical reading of research publications, discussion of controversial issues facing ESH professionals, and/or presentation of current ESH research. This course is repeatable for 3 credits.

H 515. RESEARCH METHODS IN SOCIAL AND BEHAVIORAL HEALTH SCIENCES. (3 Credits)
Provides an introduction to quantitative research methods and design. Topics include definition of research problems and questions, hypothesis generation, research design, sampling, variable definition and measurement, data collection, and ethical considerations. Also provides a brief introduction to qualitative and mixed methods.

H 516. RESEARCH METHODS IN GLOBAL HEALTH. (3 Credits)
Overview of research methods used to understand health, illness, health care, and health-seeking behavior in international settings. Special emphasis on the use of qualitative and mixed methods in international health research.

H 518. PUBLIC HEALTH ETHICS AND ISSUES. (3 Credits)
Explores key ethical issues in the context of public health practice; codes and guidelines for ethical conduct of public health practice; issues related to social accountability, vulnerable populations, and ethical framework for community engagement.

H 519. DISPLACEMENT, MIGRATION, AND GLOBAL HEALTH. (3 Credits)
Critical examination of health of displaced/migrant populations with an emphasis on health disparities and social determinants. Understanding intersections of humanitarianism, migration, vulnerability, and displacement from a global health perspective.

H 520. HEALTH DISPARITIES. (3 Credits)
Health disparities based on race/ethnicity, culture, social class, and rural/urban residence, among others; strategies to reduce disparities, promote health, and prevent disease in diverse populations.

H 521. MENTAL HEALTH. (3 Credits)
Focus upon mental health policy development, in relation to federal and state government services and regulations, implementation of services.

H 522. HEALTH, AGING AND CONTROL OF CHRONIC DISEASES. (4 Credits)
Epidemiology of the major chronic diseases, risk factors, potential methods of prevention/intervention, ethical issues, and efficacy of current methods of prevention and control. Emphasis on adult populations and public health services, policies, and programs at the local, state, and federal levels designed to promote healthy aging. Recommended: 9 credits of public health course work.

H 523. FOUNDATIONS OF PUBLIC HEALTH. (4 Credits)
Fundamental principles, concepts and tools used in public health to promote the health of populations. Using a combination of case study method, lecture and discussion, students will develop a broad understanding of public health and recognition of how discipline-specializations address the social, behavioral and environmental determinants of public health.

H 524. INTRODUCTION TO BIOSTATISTICS. (4 Credits)
Quantitative analysis and interpretation of health data including probability distributions, estimation of effects, and hypothesis-tests such as Chi-square, one-way ANOVA, and simple linear regression.

H 525. EPIDEMIOLOGICAL METHODS I. (3 Credits)
Introduction to the concepts and methods of epidemiology. Topics include measures of population health, screening, study design, measures of association, and interpretation of epidemiological data.

Prerequisites: H 513 with B- or better or H 535 with B- or better

H 526. EPIDEMIOLOGIC METHODS II. (3 Credits)
Concepts and methods of epidemiological analysis; standardization; stratified analysis; confounding and its control; planning and conducting epidemiologic research; role of multivariate analysis in epidemiologic research.

Prerequisites: H 524 with B- or better and H 525 [B-]

H 527. CRITICAL ASSESSMENT OF INTERNATIONAL HEALTH PROGRAMS. (3 Credits)
Introduces the critical evaluation framework of assessing international health development programs, based on self-determination and community ownership principles. The framework of assessment method includes three levels: upstream evaluation, midstream evaluation, and downstream evaluation.

Recommended: H 528 and H 529

H 528. GLOBAL HEALTH ISSUES. (3 Credits)
Examines major issues in health developments of global significance, their causes and impacts on international health, and methods and strategies to address them.

H 529. INTERNATIONAL HEALTH. (3 Credits)
Overview of the epidemiological, economic, political, sociological, and cultural factors that impact on international health. Special emphasis on the methods of prevention/intervention utilized in coping with health problems on an international level.

H 530. HEALTH POLICY ANALYSIS AND POLITICS. (3 Credits)
Examination of current health policy issues affecting health care programs, services, and organization as well as the role of politics in public health and health policy. Exploration of processes by which health policy proposals are generated, promoted, defeated, modified and implemented.

Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 532. ECONOMIC ISSUES IN HEALTH AND MEDICAL CARE. (3 Credits)
Application of economics principles to the health care field: the demand for medical care and insurance, health care suppliers, health care markets.

Recommended: ECON 201

H 533. HEALTH SYSTEMS ORGANIZATION. (3 Credits)
Examines the nature of health and health care services and reviews the role of government and the free market on health services. Alternative ways of organizing, financing, and delivery of health care services are explored.

H 534. HEALTH CARE LAW AND REGULATION. (3 Credits)
Legal aspects of health care delivery; tort law and its applications; professional liability and liability insurance; laws relative to health care institutions, cost controls, antitrust and access.
H 535. INTERPRETING EPIDEMIOLOGIC EVIDENCE. (3 Credits)
Intended for students in the human sciences and allied health fields. Introduces basic epidemiology concepts. Topics will include measures of disease frequency, assessing population health, causal logic, quantifying associations between exposures and health outcomes, epidemiologic study design, and threats to study validity (random error, bias, confounding). Examples focus on application of epidemiological methods to a variety of health-related fields.

H 536. HEALTHCARE ORGANIZATION LEADERSHIP THEORY AND BEHAVIOR. (3 Credits)
Overview of organization theory and behavior in health care organizations. Emphasis is on developing an understanding of the factors and forces that influence the structures, behaviors, and operations of health care delivery organizations. This understanding will be developed through consideration of organizations, their environments, and the roles of individuals working in management.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better

H 537. INJURY EPIDEMIOLOGY. (3 Credits)
An overview of the distribution and determinants of injuries, methodological issues specific to injury epidemiology, and approaches to injury control.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 513 with B- or better
Recommended: Graduate epidemiology training

H 538. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, and their financial reimbursement mechanisms.

H 540. WATER AND HUMAN HEALTH. (3 Credits)
Critically examine the complex relationship between water quality, human activities, and population health.

H 541. AIR QUALITY AND HUMAN HEALTH. (3 Credits)
Examination of the major sources of air pollution, its impact on ecosystems and climate change, and population health. Will also discuss technologies and introduce regulations that are used to control air pollutants.

H 542. ENVIRONMENTAL AND OCCUPATIONAL HEALTH RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern environmental and occupational risk analysis and how they are utilized to make evidence-based decisions by regulatory agencies.

H 543. EXPOSURE SCIENCE I. (4 Credits)
Overview of the concepts, principles and practices in modern environmental and occupational exposure assessment. Exposure Science I provides a broad introduction to environmental and occupational exposure assessment methods, while Exposure Science II focuses on sampling and measurement methods.

H 544. ENVIRONMENTAL AND OCCUPATIONAL EPIDEMIOLOGY. (3 Credits)
Examines exposure assessment methodology and epidemiological study designs that are commonly used in environmental and occupational health science in order to characterize the impact of environmental and occupational exposures on population health.
Prerequisites: H 525 with C or better
Recommended: Graduate level statistics course

H 546. PHYSICAL AGENTS AND HUMAN HEALTH. (3 Credits)
Focus on physical agents (heat, noise, vibration, radiation) and health risks associated with these agents. It covers the range and sources of exposure to physical agents, methods of characterizing these exposures, effects on human health, and the regulations/standards that set limits for physical agents. Lec/lab.

H 547. GIS AND PUBLIC HEALTH. (4 Credits)
Applications of geographic information systems (GIS) to public health are reviewed, including mapping, spatial analysis methods, estimating access, and exposure assessment. This course is geared toward individuals involved in public health who have no (or introductory level) knowledge of GIS. Lec/lab.

H 548. PUBLIC HEALTH TOXICOLOGY. (3 Credits)
Introduction to the concepts and principles of toxicology as they apply to environmental and occupational health.
Recommended: H 344 with a grade of C- or better and one term of basic chemistry.

H 549. MASS MEDIA AND HEALTH. (3 Credits)
Examines the effects of mass media on population health, from the negative impact of advertising of cigarettes, alcohol and junk food, to the (hopefully) positive impact of public health campaigns.
Prerequisites: H 571 with C or better

H 550. SOCIAL EPIDEMIOLOGY. (3 Credits)
Explores the social determinants of health at the population level. Primary focus is on introduction to methods specific to social epidemiology, but will also provide an overview of current understanding of the empirical associations between social factors and health.
Prerequisites: H 525 with B or better
Recommended: Introductory course in epidemiology

H 551. APPLIED EPIDEMIOLOGICAL ANALYSIS OF SECONDARY DATA. (3 Credits)
Practical experience performing a hypothesis-driven epidemiological analysis utilizing secondary surveillance or other appropriate data set, writing an analytical plan, appropriate programming for the analysis (using STATA or SAS), understanding the analysis output, preparing tables, and interpreting results.
Prerequisites: H 526 with B- or better and H 560 [B-] and H 580 [B-]

H 552. DISASTER EPIDEMIOLOGY. (3 Credits)
Describe the impact of natural and manmade disasters on human health, understand epidemiologic methods specific to disasters, and apply fundamental epidemiologic methods to identify and characterize disaster-related adverse health outcomes.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 554. EPIDEMIOLOGY OF AGING. (3 Credits)
An overview of the core principles of the epidemiology of aging is provided. There will be an emphasis on health and disease processes in older adults. Students will learn essential study design and analytic issues that may arise in studies of aging.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better

H 555. CANCER EPIDEMIOLOGY. (3 Credits)
Introduction to basic concepts and methodology in cancer epidemiology.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
H 556. STRATEGIC MANAGEMENT OF HEALTH SERVICE ORGANIZATIONS. (3 Credits)
Theories and methodologies of long-range planning and strategic management in health care organizations.

H 557. FINANCIAL MANAGEMENT OF HEALTH CARE ORGANIZATIONS. (3 Credits)
Utilization of standard financial tools needed to manage the capital resources of health care organizations. Includes funding capital projects, product costing, budgeting methods, capital formation and investment strategies.
Recommended: H 210 and H 250

H 558. REIMBURSEMENT MECHANISMS. (3 Credits)
Techniques used in cost-effectiveness analysis. Examples are drawn from the public health and health economics literature.

H 560. PUBLIC HEALTH SURVEILLANCE. (3 Credits)
An introduction to public health surveillance systems (national and international) for chronic and infectious diseases. Utility of existing surveillance systems for secondary epidemiological data analysis.
Prerequisites: H 524 with B- or better and H 525 [B-]

H 562. INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Understand epidemiologic methods specific to infectious diseases, apply fundamental epidemiologic methods to infectious disease questions, and describe the broad trends in global infectious disease burden. The application methods and principles will be explored through lectures, discussions, assignments and writing projects.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or H 514 with B- or better

H 563. PHYSICAL ACTIVITY EPIDEMIOLOGY. (3 Credits)
Physical activity epidemiology will focus on current research, controversial issues, and methodological problems in the epidemiology of physical activity, exercise, and health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 564. COMPUTING TOOLS AND HEALTH DATA ANALYSIS. (3 Credits)
Modern computational biostatistics for analyzing health data, emphasizing important technologies and methods for data processing and understanding of how they work. Topics will evolve over time as new procedures are developed.
Corequisites: H 524

H 565. PUBLIC HEALTH AND WOMEN: SOCIAL AND POLICY ISSUES. (3 Credits)
Public health approach to the identification of women's health needs in the United States and in other countries as it relates to the intersection of race, ethnicity, social class, sexual orientation, age, and ability.
Equivalent to: BA 565
Recommended: 6 credits in public health.

H 566. DATA MINING IN PUBLIC HEALTH. (3 Credits)
An introduction to high-dimensional data analysis and data mining techniques used as an information technology tool to extract previously unknown and potentially useful information from large databases in biology, medicine, and public health.
Recommended: H 581 and H 564

H 567. LONG-TERM CARE ALTERNATIVES. (3 Credits)
Overview of the long-term care alternatives. Comparisons of nursing homes with community based facilities; adult day care centers, respite to hospice facilities, social HMOs and other services; cost, quality of life and practicality are addressed.

H 568. FINANCING AND ADMINISTRATION OF LONG-TERM CARE. (3 Credits)
Examines the financing and administration of long term care. Emphasis is on a system-wide overview and specific application to nursing facility management.

H 569. MATERNAL AND CHILD HEALTH. (3 Credits)
Women's reproductive health and health of children stressing causation, management, and prevention of public health problems. Epidemiological analysis of morbidity and mortality in children and women of childbearing age; impact of social, political and economic influences on the health of women and children; comparison of issues and problems of industrialized versus developing nations. Consideration of health issues of interest to the many diverse racial and ethnic groups of women and children in the U.S. as well as the global village.

H 571. PRINCIPLES OF HEALTH BEHAVIOR. (3 Credits)
Theoretical approaches to behavior change in health promotion/education research and practice; factors influencing health behaviors, ethical behavior change issues, behavioral interventions for special populations.

H 572. COMMUNITY ORGANIZATION FOR HEALTH PROMOTION AND EDUCATION. (3 Credits)
History, theory, and practice of community organizing for health advocacy; focus on group processes, use of media, leadership, coalitions, grass roots methods and social change.

H 573. INTRODUCTION TO MULTILEVEL/HIERARCHICAL MODELS. (3 Credits)
Introduction to the theory and application of hierarchical models to problems in epidemiology and public health. Hierarchical models will be dealt with using both frequentist and Bayesian frameworks.
Recommended: H 581

H 575. EVALUATION OF HEALTH PROMOTION AND EDUCATION PROGRAMS. (3 Credits)
Provides theoretical and practical bases for program evaluation. Develops basic skills in a variety of approaches to evaluation, including techniques that are particularly suitable for evaluating health promotion, community health improvement, and related health and social services programs. Course learning is synthesized through designing an evaluation framework and methodology for a relevant program.
Prerequisites: H 513 with B- or better or H 515 with B- or better or HHS 514 with B- or better

H 576. PROGRAM PLANNING FOR HEALTH/HUMAN SERVICES. (4 Credits)
Provides students with an introduction to the principles of program planning and the development of program plans, with a focus on evidence-based public health/human services. Students will have the opportunity to integrate skills developed through prior courses in the context of writing a program plan.
Prerequisites: (H 515 with C- or better or HHS 514 with C- or better) and H 571 [C-] and H 575 [C-]

H 578. INTRODUCTION TO MOLECULAR EPIDEMIOLOGY I. (3 Credits)
A survey of and introduction to the methods and issues arising in genetics and molecular epidemiology, including key biostatistical methods, study designs, and technologies used in the conduct of these studies. Students will gain experience conducting critical reviews of research papers with respect to study design and biostatistical analysis.
Prerequisites: (H 524 with C or better and H 526 [C])
Recommended: Knowledge of and familiarity with basic concepts of molecular biology (DNA replication, transcription, and translation)
H 580. LINEAR REGRESSION AND ANALYSIS OF TIME TO EVENT DATA. (4 Credits)
Multiple linear regression analysis for measurement data and survival analysis methods for time to event health data, including modes of inference, diagnostics, model selection, and reporting conclusions. Lec/lab.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 581. GENERALIZED LINEAR MODELS AND CATEGORICAL DATA ANALYSIS. (4 Credits)
Biostatistical methods focusing on binary and count data will provide a foundation for understanding and implementing generalized linear regression and categorical data models that are commonly used to analyze epidemiological and public health data from cohort, case-control, and clinical trial study designs. Lec/lab.
Recommended: H 580

H 582. ANALYSIS OF CORRELATED HEALTH DATA. (3 Credits)
Biostatistical methods for clustered, repeated measures, and longitudinal correlated health data, with an introduction to applications of linear and generalized linear mixed models and generalized estimating equations.
Prerequisites: H 581 with C or better

H 583. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT. (4 Credits)
Studies the design and management principles and practices in the environment, safety and health field.

H 584. ANALYSIS OF INTERVENTION STUDIES AND CLINICAL TRIALS. (3 Credits)
Principles of data analysis from intervention studies and clinical trials, including professional graphical and tabular presentation, reproducibility and reliability of measurements, and controlling the Type I error rate when analyzing multiple endpoints. Basic principles of designing experiments are also covered including blocking, stratification, interaction, and control of variability.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 585. ENVIRONMENT, SAFETY AND HEALTH POLICY AND LAW. (3 Credits)
Survey of the environment, safety and health policy and law in the United States. Furnishes the basic knowledge and general understanding about policy and law-related issues important to all environmental health and safety professionals.
Recommended: H 385

H 586. BAYESIAN BIOSTATISTICS IN PUBLIC HEALTH. (3 Credits)
An examination of methods for designing and implementing Bayesian analysis to address scientific questions through hands-on experience with health data. This survey course also covers proper interpretation and communication of results from practical Bayesian methods for biostatistics data analysis, with illustrations of the utility of Bayesian ideas in public health.
Prerequisites: H 581 with C or better

H 587. TIME TO EVENT ANALYSIS OF HEALTH DATA. (3 Credits)
Biostatistical models and methods for survival analysis of time to event data that are routinely encountered in biomedical and health research.
Prerequisites: (H 524 with C or better or HDFS 530 with C or better)

H 588. APPLIED OCCUPATIONAL SAFETY AND HEALTH. (3 Credits)
The management and technical aspects of a workplace safety and health program are identified and assessed. Students completing the course receive a 30-hour OSHA General Industry card.

H 589. EMERGENCY AND DISASTER MANAGEMENT. (3 Credits)
Study of preparedness, response, recovery and business resumption strategies, activities and applications needed to effectively deal with emergency and disaster incidents.

H 590. OCCUPATIONAL ERGONOMICS AND BIOMECHANICS. (3 Credits)
Examines the advanced theories, applications, and contemporary topics of occupational ergonomics and biomechanics. Topics include muscle physiology, work-related musculoskeletal disorders, assessing biomechanical exposure in the workplace, various material handling assessment tools, 3-Dimensional Static Strength Prediction Program, human vibrations, and implementing ergonomic interventions.

H 591. SELECTED TOPICS. (1-3 Credits)
Recent changes and advances in public health and health care administration and their application to special fields of study. Topics vary from term to term and year to year.
This course is repeatable for 9 credits.

H 592. SPATIAL EPIDEMIOLOGY. (3 Credits)
An introduction to methods in spatial epidemiology is provided, including spatial exploration of health data, quantifying spatial patterns and clusters, spatial exposure assessment, and explaining patterns and associations.
Prerequisites: H 547 with C or better and H 581 [C]

H 593. REPRODUCTIVE EPIDEMIOLOGY. (3 Credits)
Focuses on current research, controversial issues, and methodological problems in the epidemiology of reproductive health.
Prerequisites: H 513 with B- or better or HHS 514 with B- or better or H 525 with B- or better or H 535 with B- or better
Recommended: H 524

H 594. APPLIED ERGONOMICS. (3 Credits)
Principles of occupational ergonomics for managing optimal worker performance and well-being.

H 595. DESIGN FOR ENVIRONMENT, SAFETY, AND HEALTH. (3 Credits)
Systematic consideration of environmental, safety, and health concerns at the earliest possible stage in the lifecycle design engineering of products, technologies, and manufacturing processes.

H 596. HEALTHCARE EPIDEMIOLOGY. (3 Credits)
Focus on current research, controversial issues, and methodological problems in the epidemiology of healthcare. Topics include institutional infection control, medical errors, screening and diagnostic testing, cost-effectiveness, and others related to the delivery and assessment of healthcare, with a focus on the US healthcare system specifically.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
Recommended: H 524

H 597. METHODS IN FOODBORNE DISEASE OUTBREAK INVESTIGATION. (3 Credits)
Focuses on the practical basis for developing and implementing methods for foodborne disease outbreak detection, investigation and control, using recent outbreaks to highlight underlying principles. Biological characteristics of major foodborne disease pathogens, clinical features of the illnesses its causes and epidemiologic presentations of foodborne outbreaks will be reviewed. The implications of these characteristics will be discussed in a problem solving, interactive format that examines theory and practice in the context of recent outbreaks. Strategies to promote timely decision-making will be emphasized.
Prerequisites: H 513 with B- or better or H 525 with B- or better or H 535 with B- or better or HHS 514 with B- or better
H 598. HEALTH POLICY ANALYSIS METHODS. (3 Credits)
Analysis of public policies affecting health care programs, services and organizations and the impact of those programs on citizens. Health services research methods, including data sources for health policy research and health policy literature.
Prerequisites: H 513 with B- or better and H 533 [B-]

H 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 24 credits.

H 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

H 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

H 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

H 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

H 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

H 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

H 611. INTRODUCTION TO SYSTEMATIC LITERATURE REVIEWS. (3 Credits)
Students will learn how to apply systematic review methodology to a research question of their choice and understand how literature reviews inform evidence-based decision-making. Examples will focus on applying literature reviews to public health, clinical science, and biomedical research.

H 612. DOCTORAL SEMINAR IN PUBLIC HEALTH: RESEARCH AND PRACTICE. (1 Credit)
Contemporary research and professional issues specific to the discipline of public health. Includes responsible conduct of research, writing for publication, professional development and leadership, and faculty research in public health.
This course is repeatable for 9 credits.

H 613. INDEPENDENT RESEARCH PROJECT. (1-9 Credits)
Independent research project for PhD students, including research design, execution or research, and the formal presentation of findings in written form. Student will develop an original research topic based on knowledge and review of the literature in a public health-relevant area of inquiry. Graded P/N.
This course is repeatable for 9 credits.

H 614. RESEARCH MANUSCRIPT. (4 Credits)
PhD students write a manuscript to submit to a peer-reviewed journal as part of the course requirements. Graded P/N.

H 615. ADVANCED EVALUATION AND RESEARCH DESIGN. (3 Credits)
Provides an in-depth examination of advanced research designs and methods for establishing causal statements about the efficacy, effectiveness and generalizability of public health and social service interventions designed to alter public health and social risk or protective factors.
Recommended: H 515 and H 575

H 620. ADVANCED TOPICS IN GLOBAL HEALTH INTERVENTION AND PRACTICE. (3 Credits)
Examines the processes and tools involved in planning and evaluating culturally competent health and human service prevention and intervention programs in the global context. Special considerations in program decision-making in the global context (community engagement, cultural competence, sustainability, feasibility, political/ethical issues) will be explored. Provides a key forum for doctoral students to share ongoing developments in their research and practice drawing from fieldwork as well as attended conferences and meetings.

H 622. GLOBAL HEALTH SYSTEMS, POLICY AND POLITICS. (3 Credits)
Focuses on learning to identify key stakeholders in the politics of global health, and to be able to describe political and policy processes involved in negotiating global health decisions. Employment of theories and evidence from both the global North and South to explain political processes affecting public health practice and programs.

H 626. GLOBAL HEALTH SYSTEM FINANCE AND STRENGTHENING. (3 Credits)
Introduces an analytical framework of health system finance strengthening for global health, from local community to national level and international level. Develops the analytical skill and knowledge for examining the source and mechanism of financing health systems and identify, mobilize, organize, and manage domestic and global health resources. Provides training to examine equity and efficiency of financial burden in a health system, and the strategies to strengthen it.

H 630. QUANTITATIVE HEALTH POLICY RESEARCH METHODS I. (4 Credits)
Contemporary doctoral-level quantitative health policy/services research methods emphasizing linear regression models, data sources for health policy research, and health policy research literature.
Prerequisites: H 524 with B- or better

H 632. APPLIED HEALTH ECONOMICS. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing causal inference when potential endogeneity is present.
Prerequisites: H 630 with B- or better

H 635. COST EFFECTIVENESS ANALYSIS IN HEALTH AND MEDICAL CARE. (3 Credits)
The primary objective of this course is to introduce students to cost-effectiveness studies in health and medical care. Covers the core concepts of CEA, quality adjusted life years, cost calculations, and decision rules.

H 638. PUBLIC AND PRIVATE HEALTH INSURANCE. (3 Credits)
Introduction to the principles and practices of public or social and commercial health insurance, their finance mechanisms, and theoretical foundation behind the selection of certain system of health insurance and finance method.
Prerequisites: H 533 with C or better

H 639. COMMUNITY-BASED PARTICIPATORY RESEARCH. (4 Credits)
Focuses on initiating and conducting research in partnership with communities. Includes in-depth examination of community-based participatory research (CBPR) elements, principles, theories, and approaches; how researchers can successfully partner with communities; and research with minority and/or underprivileged communities; with examples from environmental health, gerontology, and health promotion.
Recommended: 9 credits of public health or HDFS graduate coursework
H 642. ENVIRONMENTAL AND REGULATORY RISK ASSESSMENT. (3 Credits)
Understand concepts, principles and practices in modern risk analysis and how they are utilized to make evidence-based decisions in public health. Focus will be on real world examples of risk assessment by environmental and occupational regulatory agencies.

H 650. REPORTING RESULTS: WRITING FOR EPIDEMIOLOGY. (3 Credits)
Applied experience writing a scientific paper to disseminate results, including deciding on authorship, preparing a lay summary, revising and responding to peer review, and serving as a reviewer.
Prerequisites: H 526 with B- or better and H 551 [B-] and H 580 [B-]

H 651. ADVANCED EPIDEMIOLOGICAL METHODS. (4 Credits)
Covers advanced topics in epidemiology. Course expands on many of the same topics as H 526, and explores them in greater breadth and depth. Topics include causal theory, measures of disease and association, confounding, selection bias, predictive models, directed acyclic graphs, effect modification, mediation, indirect and direct effects, study design, and other contemporary topics.
Prerequisites: H 526 with B- or better and H 581 [B-]

H 652. CAUSAL INFERENCE IN EPIDEMIOLOGY. (3 Credits)
Discussion of the theoretical framework of causal statistics and the development of modern methods including propensity scores and marginal structural models. Focus is on the inverse probability of treatment weighting; discussion of other estimation methods will be included. Additional topics may include longitudinal causal models, causal mediation, instrumental variables, and other contemporary topics.
Prerequisites: H 652 with B- or better and H 581 [B-]

H 659. QUANTITATIVE HEALTH POLICY RESEARCH METHODS II. (4 Credits)
Advanced doctoral-level quantitative health policy/services research methods emphasizing health care utilization, expenditures, and outcomes data.
Prerequisites: H 651 with B- or better

H 662. ADVANCED METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY. (3 Credits)
Covers advanced methods and principles for infectious disease research, including framing infectious disease issues into testable hypotheses, designing epidemiologic studies using appropriate sampling strategies, and identifying strengths and weaknesses of various epidemiologic research methods.
Prerequisites: H 526 with B- or better and H 562 [B-]

H 671. ADVANCED THEORIES OF HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of major theories of health behavior (both health compromising and health enhancing).
Recommended: H 571

H 672. ADVANCED QUALITATIVE METHODS IN HEALTH BEHAVIOR. (3 Credits)
Provides an in-depth examination of the use of qualitative methods in health behavior research and practice.
Recommended: H 515 and SOC 518 and HDFS 538

H 673. MEASUREMENT OF HEALTH BEHAVIOR CONCEPTS. (4 Credits)
Provides in-depth study and field work for graduate students in public health and related fields of the methods used in the conceptualization, development, and evaluation of quantitative measures of health behavior and related concepts.
Recommended: H 524, H 515, and 3 credits in other quantitative research methods or social behavioral methods (eg. sociology or psychology or health promotion or education programs)

H 675. DEVELOPMENT OF HEALTH BEHAVIOR INTERVENTIONS. (3 Credits)
Examines the application of social/behavioral theories in health promotion interventions and in conducting intervention research in diverse populations. The course will focus on program development, on implementation strategies, and on translation into practice.
Recommended: H 571 and H 575 and H 576

H 676. ADVANCED TOPICS IN HEALTH PROMOTION AND HEALTH BEHAVIOR. (3 Credits)
Examines topics of relevance to health promotion and health behavior. Specific topics include current issues and emerging research findings, with a focus on social and behavior science perspectives, analysis of public health problems, and application of principles and practices of health promotion and health behavior.
This course is repeatable for 6 credits.
Recommended: H 515 and H 571

H 681. ADVANCED TOPICS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY. (3 Credits)
Advanced topics in the environment, safety and health discipline. Content varies with each offering.

H 682. ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY: MOVING FROM RESEARCH TO PRACTICE. (3 Credits)
An examination of research transfer models that can be adapted and implemented to environmental and occupational settings. Case studies and content will vary with each course offering.

H 683. ADVANCED RESEARCH METHODS IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH. (3 Credits)
Covers advanced methods for environmental and occupational health research, including framing environmental and occupational health issues into testable hypotheses, designing appropriate studies, and identifying strengths and weaknesses of different research methods.

H 685. RACE, CLASS, CULTURE AND AGING. (4 Credits)
Examines the diversity among the older population in health status, health beliefs/behaviors, and health care, and explores the interaction of culture and structure as determinants of their life chances. The empirical literature used in the course is drawn from the experiences of aging African-American, Latino, and Asian-Pacific Islander elderly. Taught spring term even years. CROSSTLISTED as H 685/HDFS 685.
Equivalent to: HDFS 685
Recommended: 9 credits of public health or HDFS graduate coursework

H 699. SPECIAL STUDIES. (1-16 Credits)
This course is repeatable for 16 credits.

Public Policy (PPOL)

PPOL 002. LEADERSHIP. (0 Credits)
Provides students with basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps students explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.
Additional readings will be posted on Canvas. The format includes reading, discussion, review questions and exercises, discussion board participation, and data collection, analysis and reporting. Activities include reading, reflection, exercises and a multi-stage policy analysis memo project using analyses conducted in PPOL 421.

**Prerequisites:** ECON 201 with D- or better and PS 201 [D-] and SOC 204 [D-]

**Attributes:** CWIC – Core, Skills, WIC

**PPOL 422. **POLICY ANALYSIS. (4 Credits)

Overview of common policy analysis approaches, methods and tools used to identify, assess, present and select public policy. Assignments include reading, reflection, exercises and a multi-stage policy analysis memo project using analyses conducted in PPOL 421.

**Prerequisites:** PPOL 421 with C or better

**Attributes:** CSST – Core, Synthesis, Science/Technology/Society

**PPOL 447. **INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE. (4 Credits)

Environmental decisions include trade-offs. Policy choices for sustainably providing Earth's eight billion people with food, energy, and water are urgently needed. Policy sectors (such as food) risk outcomes that are not beneficial, and impose long-term costs and potential catastrophic climate burdens. This transdisciplinary course examines emerging integrated policies concerning provision of food, energy, and water and their relationship to climate.

**PPOL 448. **MARINE POLICY IN THE UNITED STATES. (4 Credits)

Introduces students to the history, rationale, achievements, and gaps in American ocean policy. Students will acquire foundational tools of policy analysis and problem solving, and will synthesize and apply their knowledge creatively in order to propose integrated policy solutions to specific contemporary marine issues.

**PPOL 452. **INTERNATIONAL COMPARATIVE RURAL POLICY. (4 Credits)

Examines and compares the role of rural policy in different cultural, political and administrative contexts at the international, national, state, regional and local levels. The course also provides the opportunity to study the nature and implications of new forms of governance in rural contexts in North America and Europe.

**PPOL 501. **RESEARCH AND SCHOLARSHIP. (1-12 Credits)

Graded P/N.

**PPOL 505. **READING AND CONFERENCE. (1-10 Credits)

**PPOL 507. **SEMINAR. (1-6 Credits)

**PPOL 510. **INTERNSHIP. (1-12 Credits)

Supervised work experience in government, public policy, public affairs or non-profit organizations. Reports and appraisals required. Graded P/N.

**PPOL 511. **PUBLIC ORGANIZATIONS AND LEADERSHIP. (4 Credits)

Provides an historical overview of developments in, and theories associated with, the organization and control of public organizations. Students will critically examine various influential models of bureaucracy, while also learning about the strengths and weaknesses of emergent forms of bureaucratic organization, including networks, public-private partnerships, collaboration, and governance. The course also explores different theories of leadership, assisting students in the development of their own authentic leadership style, and thinking through the application of such theories and styles to the real world of public organization leadership, especially in the fragmented, decentralized, complex, and uncertain contemporary environment of networks, partnerships, and governance.

**PPOL 512. **PUBLIC POLICY THEORY. (4 Credits)

Theoretical approaches to the study of the policy process, policy elements, policy tools, (e.g., regulation), and policy typologies.

**Equivalent to:** PS 571

**PPOL 521. **UNDERSTANDING SOCIAL RESEARCH. (4 Credits)

Study of basic concepts and principles of qualitative and quantitative social research, including selection of general strategies and specific designs, conceptual and operational measurement, sample selection, data collection, data processing and analysis techniques, interpretation and reporting. Utilizes reports of social research in scholarly journals, popular media, and agency documents. Emphasis on critical evaluation and interpretation.

**Equivalent to:** SOC 515
PPOL 522. QUANTITATIVE METHODS FOR PUBLIC POLICY ANALYSIS. (4 Credits)
Covers a variety of techniques for analyzing quantitative data, including linear regression, logistic regression, and other techniques. Emphasis is placed on working with data and software to answer research questions. Prior knowledge of hypothesis testing and descriptive statistics is assumed.
Prerequisites: PPOL 521 with C or better and ECON 524 [C]
Equivalent to: SOC 516

PPOL 523. QUALITATIVE RESEARCH METHODS. (4 Credits)
An introduction to the theory and methods of qualitative research. Students will be exposed to various qualitative research methods through practical field exercises. These include ethnographic field observation, content analysis, interviewing, focus groups and unobtrusive measures. Other commonly used methods of collecting qualitative data are also examined.
Equivalent to: SOC 518
Recommended: SOC 204 or SOC 204H

PPOL 524. APPLIED RESEARCH METHODS. (4 Credits)
Application of sociological theory, concepts, and methods. Topics vary but may include program evaluation, social impact assessment, policy analysis, focus group research, survey research, among others.
Equivalent to: SOC 519
Recommended: SOC 204 or SOC 204H and at least one upper-division course in sociology.

PPOL 525. MANAGING AND GOVERNING PUBLIC AND NON-PROFIT ORGANIZATIONS. (4 Credits)
Provides students with an introduction to management in public and non-profit organizations. Public and non-profit managers face challenges that are not faced by their counterparts in the private sector. These challenges are often associated with a different legal structure, employee protections, and differences in ethos and motivation. Students will build on knowledge of public administration to examine contemporary issues of public management and public governance and the techniques and challenges of management in practice. Successful completion of the course will equip students to be critically reflective practitioners and scholars of the management of public and non-profit organizations.
Recommended: Public Administration or PS 572 or PPOL 532 or experience in working in public or community service

PPOL 531. INFLUENCING PUBLIC POLICY: AN INTRODUCTION TO THE DARK ARTS. (4 Credits)
Explores the various tactical and strategic behaviors that individuals and groups use to influence public policy. Focusing on the ethical and pragmatic dimensions of policy consequential tactics and strategy, topics vary but may include policy communication, the use of science and evidence, human cognition and decision-making processes, lobbying, and vote and agenda manipulation.

PPOL 541. ENERGY AND SOCIETY. (4 Credits)
Explores the complex interrelationships between humans and energy, emphasizing the role of energy in critical social issues, including but not limited to: domestic and international conflict, poverty, social change, inter-generational equity, energy transitions and environmental justice.

PPOL 542. QUANTITATIVE METHODS FOR PUBLIC POLICY ANALYSIS. (4 Credits)
Explores and develops the norms, rules, institutional design, decision-making dynamic, and politics of collaborative governance arrangements for complex natural resource problem settings. Designed to bring together traditional adversaries, government agencies, and citizens to resolve and improve management of collective public problems, collaborative governance for natural resources is now an important problem-solving tool that is employed in thousands of communities, watersheds, and landscapes around the world.

PPOL 544. COLLABORATIVE GOVERNANCE. (4 Credits)
Explores and develops the norms, rules, institutional design, decision-making dynamic, and politics of collaborative governance arrangements for complex natural resource problem settings. Designed to bring together traditional adversaries, government agencies, and citizens to resolve and improve management of collective public problems, collaborative governance for natural resources is now an important problem-solving tool that is employed in thousands of communities, watersheds, and landscapes around the world.

PPOL 545. INTERNATIONAL MARINE POLICY. (4 Credits)
Explores the institutional, political and legal factors that impact international marine policy with an emphasis on the United Nations Law of the Sea Convention. Additional topics include marine resource exploitation, climate change, and national security issues as they pertain to the world’s oceans, coasts, and national policies.
This course is repeatable for 16 credits.

PPOL 546. THE POLICY AND LAW OF UNITED STATES COASTAL GOVERNANCE. (4 Credits)
Examines federal and state policy, legislative and judicial protections of public beach access; ownership and use of tide and submerged lands, including the public trust doctrine; wetland conservation; and the Federal Coastal Zone Management Act. This course is intended to equip future environmental and natural resource professionals with a foundation in US coastal management, especially areas where new professionals will be very involved (coastal development, offshore/alternative energy, and sea level rise/storm hazards). The format includes reading, discussion, and student presentations. Readings will be drawn from the textbook; additional readings will be posted on Canvas.

PPOL 547. INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE. (4 Credits)
Environmental decisions include trade-offs. Policy choices for sustainably providing Earth’s eight billion people with food, energy, and water are urgently needed. Policy sectors (such as food) risk outcomes that are not beneficial, and impose long-term costs and potential catastrophic climate burdens. This transdisciplinary course examines emerging integrated policies concerning provision of food, energy, and water and their relationship to climate.

PPOL 548. MARINE POLICY IN THE UNITED STATES. (4 Credits)
Introduces students to the history, rationale, achievements, and gaps in American ocean and coastal policy. Students will acquire foundational tools of policy problem solving, critique, and analysis, and will synthesize and apply their knowledge creatively to propose integrated policy solutions to specific contemporary marine issues.

PPOL 551. HIGHER EDUCATION POLICY. (4 Credits)
An introduction to policy issues in the area of higher education and exploration of possible tensions within the policy goals of quality, equity, access and outcomes. Students will gain knowledge of the key pieces of legislation and constitutional law governing higher education policy at both federal and state levels, as well as an overview of the relevant research in this area. Begins with a short historical introduction to the U.S. higher education system and concludes with a discussion of its competing demands and functions.

PPOL 552. INTERNATIONAL COMPARATIVE RURAL POLICY. (4 Credits)
Examines and compares the role of rural policy in different cultural, political and administrative contexts at the international, national, state, regional and local levels. The course also provides the opportunity to study the nature and implications of new forms of governance in rural contexts in North America and Europe.
PPOL 599. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 602. INDEPENDENT STUDY. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 603. THESIS. (1-12 Credits)
This course is repeatable for 999 credits.

PPOL 607. SEMINAR. (1-4 Credits)
This course is repeatable for 16 credits.

PPOL 609. PRACTICUM. (1-12 Credits)
This course is repeatable for 24 credits.

PPOL 613. ADVANCED POLICY THEORY I. (4 Credits)
First of two-class series introducing a comprehensive review of public policy theory focused on examining theoretical approaches to understanding the complex and contentious assumptions and premises that pose challenges to the way we conduct public policy.

PPOL 614. ADVANCED POLICY THEORY II. (4 Credits)
Second course in a two-course series providing a comprehensive review of public policy theory. The course examines theoretical approaches to understanding the complex and contentious assumptions and premises that pose challenges to the way we conduct public policy.

PPOL 621. ADVANCED QUANTITATIVE METHODS. (4 Credits)
Methods used in research in the social sciences, focused on causal inference in public policy contexts. Covers methods used at the frontier of research to estimate the causal effect of policies on outcomes, including instrumental variables, regression discontinuity, and difference-in-differences estimation.
Recommended: ECON 524

PPOL 622. ADVANCED POLICY ANALYSIS. (4 Credits)
Introduction to advanced quantitative modeling used in policy analysis, with an emphasis on the application of modeling techniques to research papers. Focus is predominantly on counts and zero-truncated modeling, time series, and panel regression.
Prerequisites: ECON 524 with B+ or better and PPOL 522 [B+] or PPOL 621 [C+] or AEC 523 [C+] and AEC 525 [C+]

PPOL 628. ADVANCED QUALITATIVE METHODS. (4 Credits)
Focus on epistemological approaches, research design, data analysis techniques and critiques of qualitative research, with emphasis on participant observation and interviewing. Culminates in the written and oral presentation of a qualitative research proposal, including preliminary results from fieldwork conducted during the course.
Prerequisites: ANTH 591 with C or better or HDFS 538 with C or better or SOC 518 with C or better

PPOL 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Queer Studies (QS)

QS 262. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia’s and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as QS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 262H, WGSS 262, WGSS 262H

QS 262H. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia’s and transphobia’s relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as QS 262/WGSS 262. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 262, WGSS 262, WGSS 262H

QS 299. SPECIAL TOPICS. (3 Credits)
This course is repeatable for 9 credits.

QS 321. *QUEER POP CULTURE. (3 Credits)
Examines the concept of Queer popular culture through film, music, TV, image, and other mediums. Seeks to disrupt dominant discourses around gender and sexuality by centralizing women of color feminisms and queer of color critiques to analyze popular representations of gender, sexuality, race, class, disability, and other social locations. CROSSLISTED as QS 321/WGSS 321. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WGSS 321

QS 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSLISTED as ES 361/ QS 361/WGSS 361/WLC 361.
Equivalent to: ES 361, WGSS 361, WLC 361
Recommended: Prior filmmaking experience

QS 362. *SERVING LGBTQ+ COMMUNITIES. (3 Credits)
Engages the ethics and responsibilities involved in serving LGBTQ+ communities in fields such as education, health, law, and social services for those entering and/or continuing professions in fields that historically underserve LGBTQ+ people. Topics include LGBTQ+ youth; LGBTQ+ elders; issues affecting LGBTQ+ people across their lifespans; approaches to cultural competency; violence against LGBTQ+ people, forms of oppression including heterosexism, homophobia, and transphobia; and LGBTQ+ community resilience. CROSSLISTED as QS 362/WGSS 362. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WGSS 362

QS 364. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics— including transsexual, genderqueer, and gender non-conforming issues— through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 364H, WGSS 364, WGSS 364H

QS 364H. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 364, WGSS 364, WGSS 364H
QS 375. *ARTS AND SOCIAL JUSTICE. (4 Credits)
Explores concepts of structural inequality, difference, power, and discrimination through a critical survey of arts activism. Think critically about artwork and artists which address a number of social issues in the United States, including race, ethnicity, class, gender, sexuality, immigration, and indigeneity. CROSSLISTED as ES 375/QS 375/WGSS 375.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 375, WGSS 375

QS 399. SPECIAL TOPICS IN QUEER STUDIES. (3 Credits)
This course is repeatable for 12 credits.

QS 409. PRACTICUM: PROJECTS IN QUEER STUDIES. (1-12 Credits)
Capstone projects bring theory into practice through research, design, and implementation of a project that synthesizes and demonstrates learning in the Queer Studies program.
This course is repeatable for 12 credits.

QS 431. *QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 431, WGSS 431

QS 432. *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/QS 532/WGSS 532. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ART 432, WGSS 432

QS 462. *QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSLISTED as QS 462/WGSS 462 and QS 562/WGSS 562. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues, Keywords: CPCI – Core, Pers, Cult Diversity
Equivalent to: QS 462, WGSS 462

QS 472. *INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
Attributes: CSGI – Core, Skills, WIC
Equivalent to: ES 472, WGSS 472
Recommended: QS 262 or ES 242 or WGSS 414

QS 473. TRANSGENDER LIVES. (4 Credits)
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSLISTED as QS 473/WGSS 473 and QS 573/WGSS 573.
Equivalent to: WGSS 473
Recommended: WS/QS 262, WGSS/QS 364

QS 476. *TRANSNATIONAL SEXUALITIES. (4 Credits)
Explores contemporary experiences of sexualities within transnational contexts. Examines themes including queer and LGBTQI organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSLISTED as QS 476/WGSS 476 and QS 576/WGSS 576. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: QS 262 with D- or better
Equivalent to: WGSS 476

QS 477. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: ES 477, WGSS 477
Recommended: QS 262 and QS 462

QS 499. SPECIAL TOPICS IN QUEER STUDIES. (4 Credits)
Topics in gay, lesbian, bisexual, transgender, and queer issues and scholarship. May be repeated for credit when topic varies. This course is repeatable for 12 credits.

QS 524. TRANS/GENDER POLITICS. (4 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 524/WGSS 524.
Equivalent to: WGSS 524

QS 531. QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531.
Equivalent to: ES 531, WGSS 531

QS 532. GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/QS 532/WGSS 532.
Equivalent to: ART 532, WGSS 532
**Rangeland Ecology & Management (RNG)**

**RNG 121. *INTRODUCTION TO WILDLAND ECOLOGY. (4 Credits)***

Ecological principles will be applied to understand contemporary issues related to wildlands, specifically the rangeland biomes that comprises over 50% of the Earth’s surface (FAO, SRM, USDA ERS). Topics to be covered fall into the following categories: Fundamentals of Ecology; Animals (wildlife & livestock); Disturbance (e.g., invasive species, fire, mineral extraction, etc.); Ecosystem Goods & Services (e.g., carbon sequestration, watersheds, biodiversity, recreation, etc.). The course will largely focus on U.S. wildlands, however a portion will examine the ecology and issues of international rangelands in Africa, Eurasia, Australia, and South America. (Bacc Core Course)

**Attributes:** CPBS – Core, Pers, Biological Science

**Equivalent to:** RNG 299H

This course is repeatable for 16 credits.

**RNG 351. RANGE ECOLOGY I-GRASSLANDS. (3 Credits)**

Principles and terminology of grassland ecology. Addresses the spatial-temporal dynamics of structure, function, and process in North American grassland ecosystems. Water, nutrient cycles and energy pathways are explored in context of the variable driving forces of climate (drought), herbivory, and fire.

**Recommended:** (BOT 313 [D-] and RNG 341 [D-])

**Equivalent to:** RNG 241

**RNG 352. RANGE ECOLOGY II-SHRUBLANDS. (3 Credits)**

Introduces the ecology of shrublands using an autecological approach. Explores the effects of stressors such as temperature, drought, fire, and herbivory on plant morphology, physiology, reproduction, and growth. Covers life histories of common shrubs and descriptions of shrubland communities used to promote understanding of autecological principles.

**Recommended:** BOT 313 and RNG 341

**RNG 353. WILDLAND PLANT IDENTIFICATION. (4 Credits)**

Students will learn how to identify approximately 100 plant species found in wildlands of North America and Mexico. Individual plant species ecology, basic plant anatomy and identification characteristics observable only through a microscope or dissecting scope, and how to use a dichotomous key for plant ID will also be covered.

**Equivalent to:** RNG 253

**RNG 355. DESERT WATERSHED MANAGEMENT. (4 Credits)**

A systems-based understanding of hydrologic processes in arid and semiarid landscapes. The class is focused on gaining knowledge of multiple ecological and hydrological interactions occurring in dryland watersheds and on discussing practical methodology aimed to enhance site productivity and ecosystem resilience. Emphasis is placed on land use effects on watershed function; monitoring of soil, water, and vegetation variables; and methods of rehabilitation of degraded landscapes. The course has a strong experiential learning component through a series of 'hands-on' practicums and a field trip to a semiarid location in eastern Oregon. Lec/lab.
RNG 399. SPECIAL TOPICS. (1-16 Credits)
May be repeated for a total of 16 credits.
This course is repeatable for 16 credits.

RNG 403. SENIOR THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 411. ADVANCED PLANT ID. (2 Credits)
Advanced rangeland plant taxonomy.
This course is repeatable for 16 credits.

RNG 421. WILDLAND RESTORATION AND ECOLOGY. (4 Credits)
Emphasis is placed on understanding the ecology of arid and semi-arid ecosystems through the study of ecological processes responsible for ecosystem function. Range improvement practices for stabilizing and repairing degraded wildlands by directing autogenic recovery mechanisms are discussed. This involves manipulating plants, soil, animals and microenvironments for improved ecosystem function.
Recommended: Course work in soils and ecology

RNG 441. RANGELAND ANALYSIS. (4 Credits)
Techniques used to describe vegetation in shrub-lands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods.
Recommended: ST 351 or ST 351H

RNG 442. RANGELAND-ANIMAL RELATIONS. (4 Credits)
Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiology, and their effects on management of rangeland-animal resources.

RNG 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 448, CROP 448

RNG 455. RIPARIAN ECOHYDROLOGY AND MANAGEMENT. (4 Credits)
A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).
Recommended: RNG 355

RNG 457. HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT. (3 Credits)
Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.
Prerequisites: FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D-] or ST 351 [D-])

RNG 458. HABITAT ANALYSIS 2: ABUNDANCE, OCCUPANCY AND DEMOGRAPHY. (3 Credits)
Habitat influences abundance, occupancy, and demographic rates of wildlife. Wildlife management is often a component of land management and both benefit from land stewards that have an understanding of how habitat characteristics influence the occupancy, abundance, and performance of wildlife within an area. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on abundance, occupancy, and demographic rates of terrestrial animals.
Prerequisites: FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D-] or ST 351 [D-])

RNG 470. PASTORAL SYSTEMS OF THE WORLD. (4 Credits)
Description and evaluation of ecosystems which support grazing animals and pastoralists. Biology, ecology and management of these landscapes will be explored through climate, soils, and plant communities and human-livestock interactions. The historic role of trade and contemporary challenges to the ecological, social and economic sustainability of pastoral systems will be examined.

RNG 490. RANGELAND MANAGEMENT PLANNING. (4 Credits)
Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints affecting decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required. Lec/lab.

RNG 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 503. MASTER’S THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

RNG 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 507. SEMINAR. (1-2 Credits)
This course is repeatable for 16 credits.

RNG 521. WILDLAND RESTORATION AND ECOLOGY. (4 Credits)
Emphasis is placed on understanding the ecology of arid and semi-arid ecosystems through the study of ecological processes responsible for ecosystem function. Range improvement practices for stabilizing and repairing degraded wildlands by directing autogenic recovery mechanisms are discussed. This involves manipulating plants, soil, animals and microenvironments for improved ecosystem function.
RNG 541. RANGELAND ANALYSIS. (4 Credits)
Techniques used to describe vegetation in shrub-lands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods.
Recommended: ST 351

RNG 542. RANGELAND-ANIMAL RELATIONS. (4 Credits)
Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiography, and their effects on management of rangeland-animal resources.
Recommended: RNG 341

RNG 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)
Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448/RNG 448 and ANS 548/CROP 548/RNG 548.
Equivalent to: ANS 548, CROP 548

RNG 555. RIPARIAN ECODYNAMICS AND MANAGEMENT. (4 Credits)
A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).
Recommended: RNG 355

RNG 557. HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT. (3 Credits)
Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.
Recommended: ST 511 and ST 512

RNG 558. HABITAT ANALYSIS 2: ABUNDANCE, OCCUPANCY AND DEMOGRAPHY. (3 Credits)
Habitat influences abundance, occupancy, and demographic rates of wildlife. Wildlife management is often a component of land management and both benefit from land stewards that have an understanding of how habitat characteristics influence the occupancy, abundance, and performance of wildlife within an area. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on abundance, occupancy, and demographic rates of terrestrial animals.

RNG 577. AGROFORESTRY. (3 Credits)
Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as FES 477/NR 477 and FES 577/RNG 577.
Equivalent to: FES 577, FS 577, NR 577
Recommended: Introductory course in biology

RNG 590. RANGELAND MANAGEMENT PLANNING. (4 Credits)
Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints necessary for decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required. Lec/lab

RNG 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 603. PH.D. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

RNG 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 607. SEMINAR. (1-2 Credits)
This course is repeatable for 16 credits.

RNG 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

RNG 643. WILDLAND PLANT ECOPHYSIOLOGY. (4 Credits)
Emphasizes the physiological ecology of plants living in arid and semi-arid ecosystems. Primary class emphasis will include photosynthesis, respiration, water stress and water use efficiency, stable isotopes, root structure and function, nutrient uptake and stress, and defoliation. Offered every other winter, odd years.

RNG 662. RANGELAND ECOLOGY. (3 Credits)
Studies ecological theory and related resource management implications in rangelands and arid wildlands. Topics include the history and development of rangeland ecology, plant demography, invasive species, plant population dynamics, disturbance theory, succession, vegetation classification and range condition assessments. Offered every other winter, even years.
Recommended: Basic ecology course

RNG 670. ECOLOGICAL INVASIVE PLANT MANAGEMENT. (2 Credits)

RNG 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
REL 160. *QUESTS FOR MEANING: WORLD RELIGIONS. (4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam.
Lec/rec. CROSSLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, PHL 160H, REL 160H

REL 160H. *QUESTS FOR MEANING: WORLD RELIGIONS. (0-4 Credits)
A survey and analysis of the search for meaning and life fulfillment represented in major religious traditions of the world, such as Hinduism, Buddhism, Taoism, Zen, Confucianism, Judaism, Christianity, and Islam.
Lec/rec. CROSSLISTED as PHL 160/REL 160. (H) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 160, PHL 160H, REL 160

REL 170. *THE IDEA OF GOD. (4 Credits)
Concepts and images of God and their connections to world-views, experience, science, gender, society, self-understanding, and religions.
CROSSLISTED as PHL 170/REL 170. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 170

REL 199. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 201. STUDY OF PEACE AND THE CAUSES OF CONFLICT. (3 Credits)
Examination of the causes of personal, social, and institutional conflict and peaceful, constructive means of dealing with conflict. The history and current status of peace movements within and outside governments; prospects for world peace. Case studies in peace and conflict.
CROSSLISTED as PAX 201/REL 201. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: PAX 201

REL 202. INTRODUCTION TO RELIGIOUS STUDIES. (4 Credits)
An introduction to the academic study of religion. It examines the concepts of religion and the sacred, approaches to the study of religion, ubiquitous features of religious experience, including symbol, myth, ritual, and community, understandings of the human condition in diverse religious traditions, and ways religious communities address challenges of pluralism and secularization.
CROSSLISTED as PHL 202/REL 202.
Equivalent to: PHL 202

REL 206. *RELIGIOUS ETHICS AND MORAL PROBLEMS. (4 Credits)
An examination of the practical ethics of the monotheistic religious traditions of the West--Judaism, Christianity, Islam--and their different approaches to concrete moral problems. Topics include sexuality and marriage, euthanasia, capital punishment, pacifism and just war, and environmentalism.
CROSSLISTED as PHL 206/REL 206. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: PHL 206

REL 208. INTRODUCTION TO BUDDHIST TRADITIONS. (4 Credits)
Survey of the historical development of Buddhism in India and its spread throughout Asia and beyond by investigating the literature, rituals, history and social structure of the Buddhist traditions of Sri Lanka and Southeast Asia, Tibet and the Himalayan region, China, Taiwan, Korea, Japan, and finally its growth in the West.
CROSSLISTED as PHL 208/REL 208. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 208

REL 210. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present.
CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210, PHL 210H, REL 210H

REL 210H. *RELIGION IN THE UNITED STATES. (4 Credits)
A thematic overview of the historical study of religion in the United States, with an eye toward ways that social and cultural contexts have shaped the religious experience of Americans in different places and times. Surveys a wide array of religious movements, groups, and individuals from the colonial period to present.
CROSSLISTED as HST 210/PHL 210/REL 210. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: HST 210, HST 210H, PHL 210, PHL 210H, REL 210H

REL 212. *INTRODUCTION TO CATHOLICISM. (4 Credits)
Explores historical experiences of Roman Catholics from the origins of the tradition to the present. The course 1) explores the historical origins and expansions of Catholicism in world history, 2) examines Catholic practices, structures, ideas and beliefs, and 3) surveys the unique form Catholicism took in United States history using a wide variety of sources, including historical monographs, novels, memoir, film, papal documents, correspondence, essays, speeches, poetry, political writing, sermons, advertisements, liturgy, and artwork. Learn about the major developments, persons, institutions, and ideas that shaped the experience of Catholics in different moments of world history.
Attributes: CPWC – Core, Pers, West Culture

REL 213. *INTRODUCTION TO HINDU TRADITIONS. (4 Credits)
Survey of the historical development of Hinduism in India and the 'Hindu Diaspora.' Topics will include the Indus Valley civilization, the Vedic tradition, yoga, and Hindu renunciation, 'Classical' Hindu theism and devotion, Hindu philosophy and ritual, and modern and contemporary Hinduism.
CROSSLISTED as PHL 213/REL 213. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PHL 213

REL 214. *INTRODUCTION TO ISLAMIC TRADITIONS. (4 Credits)
Development of Islamic traditions in the Arab world and in the global context. Origins of Islam, the narrative of the Prophet Muhammad, the development of the Qur’an, and the central tenets of Islamic faith and practice. Transformation of Islam from a regional to a global tradition.
CROSSLISTED as PHL 214/REL 214. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PHL 214

REL 215. *INTRODUCTION TO JEWISH TRADITIONS. (4 Credits)
An introduction to Judaism’s traditions, histories, and practices. Covers historical origins and developments from the biblical period through the Middle Ages, and considers Judaism in the modern world. Topics include the Jewish calendar (including holidays and their traditions), Jewish life cycle events, Jewish prayer, and traditional texts such as the Mishnah and Talmud.
CROSSLISTED as HST 215/REL 215. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 215
REL 220. *WORLD-VIEWS AND VALUES IN THE BIBLE. (4 Credits)
A study of central portions of the Bible (in the Old Testament: Torah, prophets, psalms, and wisdom; in the New Testament: Jesus, gospels, and letters) from the perspective of the academic discipline of biblical scholarship, exploring the philosophical questions of the relationships between story, myth, thought, values, and understandings of life. CROSSLISTED as PHL 220/REL 220. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 220

REL 299. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 310. *CRITICS OF RELIGION. (4 Credits)
An introduction to critiques of religion by Nietzsche, Freud, Marx, and other influential thinkers. Examines the nature, scope, and effects of criticisms that challenge the psychological, moral, political, and epistemological foundations of religious belief, practice, and institutions. CROSSLISTED as PHL 310/REL 310. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 310

REL 312. *ASIAN THOUGHT. (4 Credits)
Familiarizes students with key figures in the history of Asian religious ideas and philosophy. While the emphasis will be on the philosophical traditions of Asia, it will quickly become apparent that philosophy and religion are not so easily distinguishable in many Asian traditions. Areas of thought studied will include Hindu, Buddhist, Confucian, and Taoist. CROSSLISTED as PHL 312/REL 312. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 312

REL 315. *GANDHI AND NONVIOLENCE. (4 Credits)
An examination of the life and work of Mohandas K. Gandhi, the 20th century activist and author, and the theory and practice of nonviolence in his life and work. Emphasis will be placed upon Gandhi's biographical narrative, the development of satyagraha, Gandhi's nonviolent approach to social transformation, and post-Gandhian nonviolent movements. CROSSLISTED as PHL 315/REL 315. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: PHL 315

REL 316. INTELLECTUAL ISSUES OF MEXICO AND MEXICAN AMERICANS. (4 Credits)
The philosophical, social, cultural, and political reality of Mexican Americans and their historical roots in Mexico since the Spanish Conquest. Analysis of internal colonialism, racism, machismo, fatalism, alienation, cultural identity, as well as more contemporary including NAFTA, immigration, and U.S.-Mexican relations. CROSSLISTED as PHL 316/REL 316. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 316

REL 324. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 324, HST 324H, REL 324

REL 324H. *ANCIENT JEWISH HISTORY. (4 Credits)
History of Judaism from the Second Temple through the early Rabbinic period (539 BCE–200 CE). Covers historical origins and developments of Judaism including the canonization of the Bible, Jewish life in the Persian and Greco-Roman worlds, and the beginnings of Diasporic and Rabbinic Judaism. CROSSLISTED as HST 324/REL 324. (Bacc Core Course)
Attributes: CPWC – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: HST 324, HST 324H, REL 324

REL 325. *EARLY CHRISTIANITY: ORIGINS TO 600. (4 Credits)
Traces early Christianity from its origins to the beginning of the Middle Ages. It deals with the origins and Jewish background of Christianity in Palestine, the ministry and teachings of Jesus, the spread of Christianity throughout the Roman Empire by his disciples and early missionaries, the formation of the New Testament canon, the development of Christian doctrine, controversies over heresy, and the origin of monasticism and the Papacy. CROSSLISTED as HST 325/REL 325. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: HST 325

REL 326. *HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Examines the history of global Christianity from the fifth through the seventeenth centuries. Themes to be investigated include the evolving relationship between the church and the state; mysticism; conversion and resistance; the emergence of Protestantism; marriage and sex, as well as women in the history of Christianity. CROSSLISTED as HST 326/REL 326.
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: HST 326

REL 327. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 284 A.D. to 1000. Not offered every year. CROSSLISTED as HST 327/REL 327. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 327

REL 328. HISTORY OF MEDIEVAL EUROPE. (4 Credits)
Cultural, political, and economic history of the European Middle Ages from the fall of the Roman Empire in the West to the Renaissance. Covers 1000 to 1400. Not offered every year. CROSSLISTED as HST 328/REL 328. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 328

REL 330. HISTORY OF EARLY MODERN EUROPE. (4 Credits)
Political, social, intellectual, and cultural history of Europe from 1400-1789. Focuses on the Reformation. Not offered every year. CROSSLISTED as HST 330/REL 330. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 330

REL 333. MEDIEVAL AND EARLY MODERN SPANISH HISTORY. (4 Credits)
From Islamic conquest to conquest of America, the social, religious, political and economic history of Spain from 1000 to 1700. Offered fall term in odd years. CROSSLISTED as HST 333/REL 333. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: HST 333
REL 344. *PACIFISM, JUST WAR, AND TERRORISM. (4 Credits)
An examination of the philosophical and theological issues pertaining to pacifism, justified war, and forms of terrorism in Islamic and Western traditions. Special attention is given to concepts of jihad, justifications of war, and restraints on conduct in war. CROSSLISTED as PHL 344/REL 344. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: PHL 344

REL 345. *FIRST FREEDOM: RELIGIOUS LIBERTY AND INTOLERANCE. (4 Credits)
An examination of the religious, philosophical, political, and historical issues regarding religious freedom, conscience, and disestablishment as enshrined in the First Amendment and as illustrated by historical and contemporary examples of religious intolerance in the United States. CROSSLISTED as PHL 345/REL 345. (Bacc Core Course)
Attributes: CPDP – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 345

REL 350. *MODERN LATIN AMERICA. (4 Credits)
History of Latin America leading up to and after Spanish and Portuguese conquest. Focus on indigenous American, European and African cultures and religions in contact under colonial government and economic systems. Covers the period from 1400 to 1810. CROSSLISTED as HST 350/REL 350. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 350, HST 350H

REL 352. *AFRICANS IN LATIN AMERICAN HISTORY. (4 Credits)
A survey of the role of Africans and their descendants in Latin American history, linking the history of the Americas, Europe and Africa. CROSSLISTED as HST 352/REL 352. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 352
Recommended: HST 350 and HST 351

REL 353. *SLAVERY IN THE AMERICAS. (4 Credits)
A survey of the roles of Africans and their descendants in the history of the Atlantic World, linking Europe, Africa, and the Americas. Examines slavery and freedom in the African Diaspora, as well as social, cultural, and spiritual life. CROSSLISTED as HST 353/REL 353. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: HST 353

REL 364. *UNITED STATES RELIGION AND SOCIAL REFORM. (4 Credits)
Provides an awareness of how various religious groups have thought about and engaged with social change pertaining to slavery, feminism, civil rights, same-sex marriage, and immigration. Focus on reading primary sources related to each of these issues. CROSSLISTED as HST 364/REL 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: HST 364

REL 371. *PHILOSOPHIES OF CHINA. (4 Credits)
A study of the traditional philosophies of China, including Confucianism, Taoism, Mohism, Legalism, and Buddhism. Not offered every year. CROSSLISTED as PHL 371/REL 371. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 371, PHL 371H
Recommended: 3 credits of philosophy or upper-division standing.

REL 378. *RELIGION AND GENDER: A GLOBAL PERSPECTIVE. (4 Credits)
Introduces students to the academic study of religion, as well as the academic study of gender. In order to offer a global perspective, we will read a series of case studies that deal with the religion as a gendered experience. Students will produce two essays, one of which will be based on independent research. CROSSLISTED as HST 378/REL 378/WGSS 378. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HST 378, WGSS 378

REL 387. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 600 to 1400. Early history and the formation of Islamic society to the Mongol invasion. CROSSLISTED as HST 387/REL 387. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 387

REL 388. *ISLAMIC CIVILIZATION. (4 Credits)
Political, social, and religious developments from 1400 to the present. The expansion of Islam, Turkic, and Asian dynasties, impact of Western imperialism and modern Islamic world. CROSSLISTED as HST 388/REL 388. (H) (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 388

REL 399. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 12 credits.

REL 402. INDEPENDENT STUDY. (1-12 Credits)
This course is repeatable for 16 credits.

REL 405. READING AND CONFERENCE. (1-4 Credits)
This course is repeatable for 12 credits.

REL 407. *SEMINAR. (1-16 Credits)
(Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
This course is repeatable for 16 credits.

REL 411. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle, Descartes, Hume, Kant, or Marx. Each course normally devoted to the work of a single figure. Need not be taken in sequence. Not offered every year. CROSSLISTED as PHL 411/REL 411 and PHL 511/REL 511. (H)
Attributes: LACH – Liberal Arts Humanities Core
Equivalent to: PHL 411
This course is repeatable for 16 credits.
Recommended: 6 credits of philosophy and sophomore standing.

REL 415. SELECTED TOPICS. (1-4 Credits)
This course is repeatable for 16 credits.

REL 425. *THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425, HST 425H, REL 425H
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSLISTED as HST 425/REL 425 and HST 525/REL 525. (H) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: HST 425, HST 425H, REL 425

Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSLISTED as PHL 430/REL 430 and PHL 530/REL 530. (NC) Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 430, PHL 430H

Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by 'Socially Engaged Buddhists' living Buddhist traditions. CROSSLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Equivalent to: PHL 431, PHL 431H

An examination of the practice and theory of yoga and tantra in the traditions of Hinduism, Buddhism, and Jainism, and in their contemporary popular manifestations. Emphasis on the representation of yoga and tantra in Indian literature and history, including contemplative practices, bodily disciplines, and ritual. CROSSLISTED as PHL 432/REL 432 and PHL 532/REL 532. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 432

An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga, Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSLISTED as PHL 433/REL 433 and PHL 533/REL 533. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 433

An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534. Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: PHL 434, PHL 434H, REL 434H

An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSLISTED as PHL 434/REL 434 and PHL 534/REL 534. Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: PHL 434, PHL 434H, REL 434

Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSLISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: PHL 436
Recommended: 6 credits of philosophy and sophomore standing.

A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443, PHL 443H, REL 443H
Recommended: One introductory-level science course and sophomore standing.

A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSLISTED as PHL 443/REL 443 and PHL 543/REL 543. (Bacc Core Course) (NC)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Equivalent to: PHL 443, PHL 443H, REL 443
Recommended: One introductory-level science course and sophomore standing.

Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444, PHL 444H, REL 444H

Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSLISTED as PHL 444/REL 444 and REL 544/REL 544. (H) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: PHL 444, PHL 444H, REL 444
REL 448. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSTLISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Equivalent to: ES 448, PHL 448

REL 455. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSTLISTED as PHL 455/REL 455 and PHL 555/REL 555.
Equivalent to: PHL 455
Recommended: 6 credits of philosophy or sophomore standing.

REL 461. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSTLISTED as PHL 461/REL 461 and PHL 561/REL 561.
Equivalent to: PHL 461

REL 466. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSTLISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: HST 466
Recommended: HST 202 and HST 203 or upper-division standing.

REL 470. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSTLISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: HST 470

REL 484. RELIGION AND LAW. (4 Credits)
Investigates the relationship between religion and law in Jewish, Christian, and Muslim society, as well as modern western “secular” society, considering the question from a theoretical, historical, and contemporary case-study perspective. We will look at the religious origins of legal systems, the ways in which members of religious communities engaged with their own and others’ laws, and the ways in which modern societies have used law to separate “religion” from the state. CROSSTLISTED as HST 484/REL 484 and HST 584/REL 584.
Equivalent to: HST 484

REL 485. *POLITICS AND RELIGION IN THE MODERN MIDDLE EAST. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSTLISTED as HST 485/REL 485 and HST 585/REL 585. (H) (NC)
Attributes: CPCD – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; LACH – Liberal Arts Humanities Core; LACN – Liberal Arts Non-Western Core
Equivalent to: HST 485

REL 511. GREAT FIGURES IN PHILOSOPHY. (4 Credits)
Study of the works of a major philosopher such as Plato, Aristotle, Descartes, Hume, Kant, or Marx. Each course normally devoted to the work of a single figure. Need not be taken in sequence. Not offered every year. CROSSTLISTED as PHL 411/REL 411 and PHL 511/REL 511.
Equivalent to: PHL 511
This course is repeatable for 16 credits.
Recommended: 6 credits of philosophy

REL 525. THE HOLOCAUST IN ITS HISTORY. (4 Credits)
An inquiry into the causes, course, and impact of the Holocaust. The general theme of anti-Semitism in European history is explored for background. Topics discussed for comparative purposes include anti-Semitism in American history; other episodes of mass murder in the 20th century. Not offered every year. CROSSTLISTED as HST 425/REL 425 and HST 525/REL 525.
Equivalent to: HST 525

REL 530. HISTORY OF BUDDHIST PHILOSOPHY. (4 Credits)
Examination of the major philosophical schools, texts, and thinkers in Buddhist history, emphasizing its Indian origins, but looking beyond to the various Buddhist traditions throughout Asia. CROSSTLISTED as PHL 430/REL 430 and PHL 530/REL 530.
Equivalent to: PHL 530

REL 531. BUDDHISM, NON-VIOLENCE, AND SOCIAL JUSTICE. (4 Credits)
Investigates the philosophical grounding of Buddhist ideas about non-violence, justice and social responsibility. Looks at broad-based Buddhist social activism movements and leaders; their methods of training, issues and types of actions taken by "Socially Engaged Buddhists" living Buddhist traditions. CROSSTLISTED as PHL 431/REL 431 and PHL 531/REL 531.
Equivalent to: PHL 531

REL 532. YOGA AND TANTRIC TRADITIONS. (4 Credits)
An examination of the theory and practice of yoga and tantra in the traditions of Hinduism, Buddhism, and Jainism, and in their contemporary popular manifestations. Emphasis on the representation of yoga and tantra in Indian literature and history, including contemplative practices, bodily disciplines, and ritual. CROSSTLISTED as PHL 432/REL 432 and PHL 532/REL 532.
Equivalent to: PHL 532

REL 533. THEORY AND PRACTICE OF MODERN YOGA. (4 Credits)
An examination of the phenomenon of modern yoga in theory and in practice. Emphasis on the roots of contemporary forms of yoga in the intersection between traditional Hindu and Buddhist formulations of yoga. Indian wrestling and martial arts, European gymnastics, and cosmopolitan conceptions of 'bodily culture' of both European and Indian origins. CROSSTLISTED as PHL 433/REL 433 and PHL 533/REL 533.
Equivalent to: PHL 533
REL 534. SPIRITUALITY AND ECOLOGY: GREEN YOGA. (4 Credits)
An exploration of the relationship between spirituality and ecological engagement in traditional contexts and in contemporary spirituality, with a global focus on contemplative practices rooted in Indian tradition, such as yoga. CROSSELISTED as PHL 434/REL 434 and PHL 534/REL 534.
Equivalent to: PHL 534

REL 536. PHILOSOPHY AND RELIGION. (3 Credits)
Examination of significant philosophical issues or movements and their relationship to theology and religion. CROSSELISTED as PHL 436/REL 436 and PHL 536/REL 536.
Equivalent to: PHL 536
Recommended: 6 credits of philosophy

REL 543. WORLD VIEWS AND ENVIRONMENTAL VALUES. (3 Credits)
A comparative study of world-views (secular and religious, Western and Eastern, modern and ancient) and how they affect concepts of nature, environmental values, and selected environmental issues. CROSSELISTED as PHL 443/REL 443 and PHL 543/REL 543.
Equivalent to: PHL 543
Recommended: One introductory-level science course

REL 544. BIOMEDICAL ETHICS. (4 Credits)
Application of ethical principles and decision-making processes to selected problems in medicine, health care, and biotechnology. Special attention given to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering, and allocating scarce resources. An interdisciplinary focus that draws on social, legal, economic, and scientific issues in ethical decisions in medicine. CROSSELISTED as PHL 444/REL 444 and REL 544/REL 544.
Equivalent to: PHL 544

REL 548. NATIVE AMERICAN PHILOSOPHIES. (4 Credits)
Native American perspectives on ways of knowing, sources of meaning and ethics, the nature of reality, self, community, and cosmos. Includes lectures, scholarship, story-telling, poetry, theater, and music as forums for this exploration. Introduces ideas of leading Native American thinkers about the human relation to the natural world, sources of strength and wisdom, the nature of time and place and spirit, right ways of acting in communities, both civic and biotic, and the place of beauty in a well-lived life. CROSSELISTED as ES 448/PHL 448/REL 448 and ES 548/PHL 548/REL 548.
Equivalent to: ES 548, PHL 548

REL 555. DEATH AND DYING. (3 Credits)
A multidisciplinary study of cultural, philosophical, and religious perspectives on death, dying, and grieving. Not offered every year. CROSSELISTED as PHL 455/REL 455 and PHL 555/REL 555.
Equivalent to: PHL 555
Recommended: 6 credits of philosophy

REL 561. ART AND MORALITY. (4 Credits)
The arts in the context of their connections to, and conflicts with, varied conceptions of the common good. Topics include free expression and community standards, museums and obligations toward cultural treasures, art in public places, public funding of art, the politics of taste. CROSSELISTED as PHL 461/REL 461 and PHL 561/REL 561.
Equivalent to: PHL 561

REL 566. RELIGION AND U.S. FOREIGN RELATIONS. (4 Credits)
An examination of the intersection of religion and U.S. foreign relations from the late nineteenth century to the present. Surveys major events in U.S. diplomacy, including war and peace and explores the role of religion and religious ideas in shaping national identity, core values, and civil religion. CROSSELISTED as HST 466/REL 466 and HST 566/REL 566.
Equivalent to: HST 566
Recommended: HST 202 and HST 203

REL 570. RELIGION IN THE AMERICAN WEST. (4 Credits)
The history of religion in the American West. Examines four themes in the religious history of the American West: locations (the designation of particular places as special), migrations (movement in and out of the region), adaptations (changes over time, in response to changing conditions), and discrimination (recognition of difference, as well as prejudicial treatment based on difference). Engages with various primary and secondary sources, including texts, films, and photographs. CROSSELISTED as HST 470/REL 470 and HST 570/REL 570.
Equivalent to: HST 570

REL 584. RELIGION AND LAW. (4 Credits)
Examines the role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSELISTED as HST 485/REL 485 and HST 584/REL 584.
Equivalent to: HST 584

REL 585. POLITICS AND RELIGION IN THE MODERN MIDDLE EAST. (4 Credits)
The role of religious and secular ideologies in the politics of the 20th century Middle East. Topics include the impact of liberal and nationalist thought, the Iranian revolution, radical Islamist movements, and Zionism. CROSSELISTED as HST 485/REL 485 and HST 585/REL 585.
Equivalent to: HST 585

Robotics (ROB)

ROB 421. APPLIED ROBOTICS. (4 Credits)
Multidisciplinary teams of students design, build, and demonstrate a robotic system, including all sensing, computation, and actuation. The specific task, such as checkers-playing robots, changes each year, and is designed to be challenging for ambitious students. Robots will compete in a friendly competition at the end of the term. Lec/lab.
Prerequisites: ME 430 with C or better
Equivalent to: ENGR 421

ROB 456. INTELLIGENT ROBOTS. (4 Credits)
Foundations of probabilistic reasoning for robotics. Topics include state estimation, robot motion, perception, localization and decision making under uncertainty.
Prerequisites: ST 314 with C or better
Equivalent to: ME 456
Recommended: CS 331, CS 361, ECE 353, or other programming experience

ROB 501. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

ROB 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
ROB 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ROB 506. PROJECTS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ROB 507. SEMINAR. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ROB 514. INTRODUCTION TO ROBOTICS. (4 Credits)
A broad introduction to the field of robotics, and to the graduate Robotics program. The goal of the class is to take students with different backgrounds (mechanical engineering, computer science, electrical engineering, physics, etc.) and give them a common base in the fundamentals of robotics. A secondary goal is to introduce students to the Robotics program, and to give them some of the skills that will make them successful, both in the program and as a professional roboticist.

ROB 521. RESEARCH ROBOTICS. (4 Credits)
Multidisciplinary teams of students will use the backdrop of a robotics competition to generate a research question, then design, build, and demonstrate a robotic system that is used to answer this research question. An example may be a Jenga-playing robot, where students try a new computer vision algorithm, or test a theory on force control. This directly parallels graduate research in robotics, where systems-building is necessary, and toy problems can illustrate research results, but the important focus is a core research question. The specific competition task changes each year, and robots will compete at the end of the term. Lec/lab.
Equivalent to: ENGR 521

ROB 534. SEQUENTIAL DECISION MAKING IN ROBOTICS. (4 Credits)
Examines sequential decision making in robotics with a focus on motion planning and related optimization problems applied to fielded systems in marine, aerial, and ground domains. Discussions regarding both fundamental background material as well as cutting edge research in the following areas: discrete planning, sampling-based planning, planning under uncertainty, multi-robot systems, optimization, and performance guarantees.

ROB 537. LEARNING-BASED CONTROL. (4 Credits)
Provides an introduction to learning systems and their application to the control of nonlinear systems. Covered topics include neural networks, reinforcement learning, and evolutionary algorithms. Includes project component in which students write a technical paper and give a conference style presentation based on their project.
Equivalent to: ME 537

ROB 538. AUTONOMOUS AGENTS AND MULTI-AGENT SYSTEMS. (4 Credits)
Provides an introduction to autonomous agents and multi-agent systems. In particular, it focuses on how to use agents as building blocks for different autonomous systems. Covered topics include reinforcement learning, game theory, swarms, auctions, and collectives. Because this course covers a constantly evolving field, there will be a significant paper reading component in addition to the regular lectures. Students are expected to spend at least three hours a week reading, discussing and critiquing assigned papers.
Equivalent to: ME 538

ROB 541. GEOMETRIC MECHANICS. (4 Credits)
An introduction to geometric methods in the analysis of dynamic systems. Using the kinematics of simple robotic systems as a motivating example, we explore topics such as manifolds and Lie groups, representations of velocity, holonomic and nonholonomic constraints, constraint curvature and response to cyclic inputs, distance metrics.
Recommended: Prior exposure to linear algebra and differential equations

ROB 542. ACTUATOR DYNAMICS. (4 Credits)
Focuses on how inertia, spring compliance, and other passive dynamics affect highly dynamic, software-controlled systems. Examples include robotic manipulation tasks, robot-human interaction, CNC machines, or legged locomotion. Lec/lab.
Recommended: Prior courses on dynamics and control such as ME 531, ME 533, ME 535

ROB 545. ROBOTIC MANIPULATION. (4 Credits)
Introduction to the mechanical processes governing manipulation with a focus on the kinematics, statics, and dynamics of interacting rigid bodies. Topics include numerical inverse kinematics, dynamics of open chains, and interaction control. Some manipulation problems considered include grasping, picking and placing, and assembly.

ROB 562. HUMAN CONTROL SYSTEMS. (4 Credits)
Covers mechanisms of human motor systems and control of the neuromusculoskeletal anatomy followed by functional analysis of these system components. Then all the components are integrated to study feedback control dynamics. Covers classic to modern theories of motor control, adaptation, cognitive involvement, and rehabilitation techniques.
Equivalent to: ME 539
Recommended: Basic feedback control systems, linear algebra, differential equations

ROB 564. SOFT ROBOTICS. (4 Credits)
Soft robotics researchers propose building intelligent machines purely out of stretchable compressible soft materials. The course is centered on term-long projects that will result in real soft robots with the goal of presenting to the international community. The topics covered include rapid digital manufacturing, soft actuators, soft sensors, soft logic, soft energy, applications of soft robotics, and modeling soft mechanics.

ROB 567. HUMAN ROBOT INTERACTION. (4 Credits)
The field of human-robot interaction brings together research and application of methodology from robotics, human factors, human-computer interaction, interaction design, cognitive psychology, education and other fields to enable robots to have more natural and more rewarding interactions with humans throughout their spheres of functioning.
Recommended: Background in one of human factors, usability/hci, programming experience, design

ROB 568. SOCIAL ROBOTICS. (4 Credits)
In-depth exploration of the leading research, design principles, and challenges in Human-Robot Interaction (HRI), with an emphasis on socially interactive robots. Topics include social embodiment, multi-modal communication, human-robot teamwork, social learning, aspects of social psychology and cognition, as well as applications and evaluation with human subjects. Requires participation, lightning talks, student-led lectures, written critiques of class readings, and a group project involving a hypothetical social robotics project.

ROB 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 32 credits.
ROB 601. RESEARCH. (1-16 Credits)
Graded P/N.
This course is repeatable for 99 credits.

ROB 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ROB 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

Rural Studies (RS)

RS 421. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the 'social safety net' that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSLISTED as AEC 421.
Equivalent to: AEC 421, AREC 421

RS 499. SPECIAL TOPICS. (1-5 Credits)
This course is repeatable for 9 credits.

RS 502. INDEPENDENT STUDY. (1-6 Credits)
This course is repeatable for 9 credits.

RS 512. INTRODUCTION TO RURAL STUDIES. (2 Credits)
Introduces students to the emerging theoretical perspectives, methodologies, and critical themes that define rural studies in the U.S. and elsewhere. It draws primarily from the disciplines of sociology, economics, anthropology, human development and geography, examining how each discipline understands and analyzes rural households and communities.

RS 513. CONTEMPORARY RURAL ISSUES. (2 Credits)
The focus will be on issues confronting rural Oregon. The class will also explore broader U.S. and international rural issues and examine commonalities and differences across cultures and development contexts. Weekly lecturers are drawn from the OSU community and beyond, including public policy makers, rural stakeholders, and nonprofit organizations.

RS 521. ECONOMICS OF RURAL POVERTY AND THE U.S. SOCIAL SAFETY NET. (4 Credits)
Examines the geography of poverty in the United States and the 'social safety net' that the U.S. has constructed to reduce poverty and its negative effects. Understand the geographical consequences of federal policies and the challenges of providing social safety net programs in rural areas. CROSSLISTED as AEC 521.
Equivalent to: AEC 521, AREC 521

RS 599. SPECIAL TOPICS. (1-5 Credits)
This course is repeatable for 9 credits.

Russian (RUS)

RUS 111. FIRST-YEAR RUSSIAN. (4 Credits)
Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Designed for students with no prior training in Russian. Native and/or bilingual speakers of Russian will not receive credit for RUS 111, RUS 112, RUS 113.

RUS 112. FIRST-YEAR RUSSIAN. (4 Credits)
Pronunciation, intonation, grammar, reading, writing, listening comprehension and conversation. Designed for students with no prior training in Russian. Native and/or bilingual speakers of Russian will not receive credit for RUS 111, RUS 112, RUS 113.
Prerequisites: RUS 111 with D- or better

RUS 199. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

RUS 299. SPECIAL STUDIES. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

RUS 329. SPECIAL TOPICS IN LANGUAGE, CULTURE, AND/OR LITERATURE. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year.
This course is repeatable for 16 credits.

RUS 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

RUS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

Science & Mathematics Educ (SED)

SED 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SED 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SED 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SED 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SED 409. FIELD PRACTICUM: SCIENCE AND MATHEMATICS. (3 Credits)
Placement in middle or high school (grades 7-12) to assist in developing competencies with adolescents in science/mathematics classes.
This course is repeatable for 18 credits.
SED 412. TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE. (3 Credits)
Integration of instructional technologies with other strategies to teach math and science in elementary, middle, and secondary schools in the 21st century.
Equivalent to: SED 412H

SED 413. INQUIRY IN SCIENCE AND SCIENCE EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in science as it relates to science education. Students will examine issues relating to integrating scientific understandings and practice into K-12 instruction.

SED 414. INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of mathematics as it relates to mathematics education. Students will examine issues relating to integrating mathematical understanding, mathematics standards/curricula, and mathematics-specific strategies in K-12 instruction. Lec/lab.

SED 416. INQUIRY IN SCIENCE AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in science as it relates to education. Students will examine issues relating to integrating mathematical and scientific understandings and practices into K-12 education.

SED 419. TEACHING MATHEMATICAL MODELING IN STEM. (3 Credits)
Provides students an overview of the content requirements in the Common Core Standards for Mathematics and the teaching practices that are central to those standards with a focus on the role of mathematical modeling. Students experience content lessons and lessons focused on supporting students in developing understanding of that content.
Recommended: Background in an educational setting or as a pre-service teacher at any level, a K-12 teacher or free-choice learning educator

SED 431. OVERVIEW OF FREE-CHOICE LEARNING. (3 Credits)
Examines learning that occurs when people believe they have choices over what and how they learn, how much time they spend learning, and what their sources of information are. Covers current research on learning in museums, aquariums, zoos, botanical gardens, science centers, after-school programs, media and apprenticeships.

SED 435. COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES. (3 Credits)
For students interested in improving their ability to communicate their scientific knowledge by helping general public and student audiences learn about ocean sciences in a wide variety of learning settings. Combines instruction in inquiry-based teaching methods and learning theory with work in student’s local informal learning settings like museums, zoos, aquariums and libraries.

SED 459. SCIENCE AND THE NATURE OF INQUIRY. (3 Credits)
Focuses on inquiry approaches to the teaching and learning of science. Development of teaching strategies including materials and resources for teaching science using an inquiry approach as well as more teacher-directed approaches.

SED 473. SCIENCE PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 science instruction: learning theory, nature of science, technology integration, and reform recommendations. Lec/lab/rec.

SED 474. MATHEMATICS PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 mathematics instruction: learning theory, nature of mathematics, technology integration, and reform recommendations.
Recommended: Investigation of mathematics as it relates to mathematics education and SED 414

SED 476. MATHEMATICS PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of additional pedagogical content knowledge in grades 6-12; stress on dominant themes of the school mathematics curriculum including problem solving, reasoning, communication, and connections as well as the integration of technology into the mathematics classroom.
Prerequisites: SED 474 with D- or better

SED 477. SCIENCE PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of pedagogical content knowledge in grades 6-12; science instruction; learning theory, nature of science, technology integration, and reform recommendations.
Prerequisites: SED 473 with C or better

SED 499. SPECIAL TOPICS. (3 Credits)
PREREQ: Provisional acceptance to Education Double Degree program.
This course is repeatable for 18 credits.

SED 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SED 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

SED 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SED 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SED 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SED 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

SED 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

SED 510. PROFESSIONAL INTERNSHIP. SCIENCE OR MATHEMATICS EDUCATION. (1-16 Credits)
Supervised teaching experience at the elementary, middle or high school level; students experience general classroom and professional responsibilities common to the regular science or mathematics teacher.
This course is repeatable for 16 credits.

SED 511. ANALYSIS OF CLASSROOMS I. (3 Credits)
Observation and analysis of the complex science/ mathematics classroom (grades 3-12) and school culture and their impact on student learning.

SED 512. TECHNOLOGY FOUNDATIONS FOR TEACHING MATH AND SCIENCE. (3 Credits)
Integration of instructional technologies with other strategies to teach math and science in elementary, middle, and secondary schools in the 21st century.

SED 513. INQUIRY IN SCIENCE AND SCIENCE EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in science as it relates to science education. Students will examine issues relating to integrating scientific understandings and practice into K-12 instruction.
SED 514. INQUIRY IN MATHEMATICS AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of mathematics as it relates to mathematics education. Students will examine issues related to integrating mathematical understanding, mathematics standards/curricula, and mathematics-specific strategies in K-12 instruction. Lec/lab.

SED 516. INQUIRY IN SCIENCE AND MATHEMATICS EDUCATION. (3 Credits)
Investigation of inquiry and the nature of inquiry in mathematics and science as it relates to education. Students will examine issue relating to integrating mathematical and scientific understandings and practices into K-12 education.

SED 519. TEACHING MATHEMATICAL MODELING IN STEM. (3 Credits)
Provides students an overview of the content requirements in the Common Core Standards for Mathematics and the teaching practices that are central to those standards with a focus on the role of mathematical modeling. Students experience content lessons and lessons focused on supporting students in developing understanding of that content.
Recommended: Background in an educational setting or as a pre-service teacher at any level, a K-12 teacher or free-choice learning educator

SED 520. TECHNOLOGY FOR MATH AND SCIENCE EDUCATION. (3 Credits)
Explore current and emerging technologies applied to math and science learning that promote critical thinking, communication, collaboration, and creativity. Gain technology skills and resources that can be transferred to formal and informal learning environments.
Recommended: Basic computer literacy.

SED 531. OVERVIEW OF FREE-CHOICE LEARNING. (3 Credits)
Examines learning that occurs when people believe they have choices over what and how they learn, how much time they spend learning, and what their sources of information are. Covers current research on learning in museums, aquariums, zoos, botanical gardens, science centers, after-school programs, media and apprenticeships.

SED 535. COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES. (3 Credits)
For students interested in improving their ability to communicate their scientific knowledge by helping general public and student audiences learn about ocean sciences in a wide variety of learning settings. Combines instruction in inquiry-based teaching methods and learning theory with work in student's local informal learning settings like museums, zoos, aquariums and libraries.

SED 541. WEATHER CONCEPTS FOR SCIENCE AND MATH TEACHING. (3 Credits)
Science content and pedagogy in learning and teaching basic weather concepts.
Recommended: Background in an educational setting or as a K-12 teacher or free-choice learning educator

SED 550. HIGH QUALITY SCIENCE AND MATHEMATICS INSTRUCTION. (3 Credits)
Explores high quality science and mathematics instruction to prepare professional teachers in science and mathematics. Develops skills in high-leverage instructional practices and reviews research literature that supports these practices. Investigates social justice issues related to systems of schooling in the United States.

SED 552. MATHEMATICS METHODS: PRACTICUM I. (3 Credits)
Theoretical background, practical knowledge, and skills for teaching in mathematics classrooms (grades 3-12). Instructional methods/modes, classroom management, contemporary curriculum goals and instructional planning.

SED 553. SCIENCE METHODS/PRACTICUM I. (3 Credits)
Theoretical background, practical knowledge, and skills for teaching in science classrooms (grades 3-12). Instructional methods/modes, classroom management, contemporary curriculum goals and instructional planning.

SED 554. ENGINEERING AND SCIENCE IN THE LIVES OF STUDENTS. (3 Credits)
Explore the use of construction engineering as a vehicle to make science and math more relevant and useful for the everyday life of students.
Recommended: Background in an educational setting or as a K-12 teacher or free-choice learning educator

SED 556. FOSTERING REFLECTIVE DISCOURSE IN SCIENCE AND MATH CONTEXTS. (3 Credits)
Examines ways of speaking that foster learning in science and mathematics contexts such as K-16 classrooms and free-choice learning settings (i.e., museums, zoos, science camps, etc.). Assignments assume the participant is a K-12 teacher or free-choice learning educator enrolled in a graduate licensure program or has access to an educational setting.

SED 573. SCIENCE PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 science instruction: learning theory, nature of science, technology integration, and reform recommendations. Lec/lab/rec.

SED 574. MATHEMATICS PEDAGOGY AND TECHNOLOGY I. (4 Credits)
Development of pedagogical content knowledge in grades 6-12 mathematics instruction: learning theory, nature of mathematics, technology integration, and reform recommendations.
Recommended: Investigation of mathematics as it relates to mathematics education and SED 414

SED 576. MATHEMATICS PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of additional pedagogical content knowledge in grades 6-12; stress on dominant themes of the school mathematics curriculum including problem solving, reasoning, communication, and connections as well as the integration of technology into the mathematics classroom.
Prerequisites: SED 574 with C or better

SED 577. SCIENCE PEDAGOGY AND TECHNOLOGY II. (4 Credits)
Development of pedagogical content knowledge in grades 6-12; science instruction; learning theory; nature of science; technology integration, and reform recommendations.
Prerequisites: SED 573 with C or better

SED 580. RESEARCH AND EVALUATION. (3 Credits)
Analysis of qualitative and quantitative empirical research in science education, mathematics education and education in general. Development of data collection instruments for use by researchers and teachers of science education, mathematics education and education in general, including portfolio and other forms of alternative assessment.

SED 581. PROFESSIONAL DEVELOPMENT AND PRACTICUM IN MATHEMATICS. (3 Credits)
Developing and implementing a program for continuing learning and evaluation in mathematics education.
SED 582. PERSONAL DIMENSIONS OF FREE-CHOICE LEARNING. (3 Credits)
Investigates the fundamental roles that identity, motivation, interest, prior knowledge and experience, and choice and control play in supporting learning and how learning leaders can build on these dimensions of learning in order to successfully engage lifelong learners.

SED 583. SOCIO-CULTURAL DIMENSIONS OF FREE-CHOICE LEARNING. (3 Credits)
Investigates connections between theories of free-choice learning and the fundamental concepts of sociology, social psychology and anthropology; social stratification, social structure and interaction, social institutions, and cultural background. Real world examples will be included to support learning leaders' efforts to facilitate the socio-cultural dimensions of lifelong science and mathematics learning.

SED 584. PHYSICAL DIMENSIONS OF FREE-CHOICE LEARNING. (3 Credits)
Learning is influenced by the interaction of variables within three contexts--personal, socio-cultural and physical. This course focuses on how macro-scale environmental factors (e.g. space, crowding, novelty) and micro-scale environmental factors (e.g. design elements, real objects, different media) support free-choice learning.

SED 592. PROFESSIONAL DEVELOPMENT AND PRACTICUM IN SCIENCE. (3 Credits)
Developing and implementing a program for continuing learning and evaluation in science education.

SED 594. ADVANCED INSTRUCTIONAL STRATEGIES IN SCIENCE AND MATHEMATICS. (3 Credits)
Explore instructional strategies and skills for K-12 science and math teachers to support student learning rigorous content.

SED 595. ASSESSMENT AND EVALUATION. (3 Credits)
Examines education assessment focusing on formative assessment in multiple contexts across learning environments.

SED 597. PROFESSIONAL DEVELOPMENT IN MATHEMATICS AND SCIENCE EDUCATION. (3 Credits)
Development of strategies and skills for developing, implementing and evaluating a program of professional development for mathematics or science educators considering various choices of program settings.

SED 598. MATHEMATICS AND SCIENCE CURRICULUM. (3 Credits)
Current trends, history of these trends, and rationale for mathematics and science curriculum reform across learning environments.

SED 599. TOPICS IN SCIENCE EDUCATION. (3 Credits)
Current issues, trends, and topics in science education. May be repeated for credit with different topics. This course is repeatable for 18 credits.

SED 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits. SED 601 with C or better

SED 603. DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits. SED 603 with C or better

SED 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits. SED 605 with C or better

SED 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits. SED 606 with C or better

SED 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits. SED 607 with C or better

SED 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits. SED 608 with C or better

SED 611. SURVEY OF RESEARCH ON TEACHING. (3 Credits)
Critical analysis of perspectives of research in science/math education with a focus on teaching as the unit of analysis. Prerequisites: SED 580 with C or better

SED 612. QUANTITATIVE RESEARCH DESIGN AND CRITICAL ANALYSIS. (3 Credits)
A study of quantitative research designs and analytical procedures with specific applications in science or mathematics education. Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 613. LEARNING THEORY. (3 Credits)
Provides a critical overview and analysis of current theories of learning and development, beginning with a discussion about what learning is, how it has been viewed and studied over time, and how seminal theories inform an understanding of lifelong learning and its facilitation. Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 615. PRACTICUM IN MATHEMATICS/SCIENCE IN COLLEGE TEACHING. (3 Credits)
Supervised field practicum in college mathematics/science teaching. This course is repeatable for 9 credits. SED 615 with C or better

SED 617. SURVEY OF RESEARCH ON LEARNING. (3 Credits)
Critical analysis of perspectives on student thinking and learning in science/math education. Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 622. QUALITATIVE RESEARCH TECHNIQUES. (3 Credits)
A study of qualitative research designs and analytical procedures with specific applications in science and mathematics education. Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 623. CURRICULUM THEORY. (3 Credits)
Establishes theoretical grounding of curriculum. Includes theoretical background, practical knowledge, and skills related to science and mathematics curriculum, including the history, curriculum theory and practice. Prerequisites: SED 580 (may be taken concurrently) with C or better

SED 625. CRITICAL PEDAGOGY. (3 Credits)
Builds a foundation in critical pedagogy theory and practice. Includes reading of classic and contemporary literature by recognized thinkers in the fields of critical pedagogical studies, requiring careful evaluation of empirical research and synthesis to develop a coherent point of view. Develops methodologies for analyzing data using critical pedagogical theories and intersectional perspectives.

SED 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits. SED 699 with C or better

SED 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 99 credits.

Social Science (SSCI)

SSCI 199. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 8 credits.

SSCI 211. CAREER DEVELOPMENT IN THE SOCIAL SCIENCES. (1 Credit)
An introduction to career options available to students pursuing a social science degree. Students will explore career options and engage in exercises to help them reflect on their own interests, career goals, and aspirations. Hybrid class.

SSCI 299. SPECIAL TOPICS. (1-4 Credits)
This course is repeatable for 8 credits.
SOCI 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SOCI 204. *INTRODUCTION TO SOCIOLOGY. (3 Credits)
Development and application of sociological concepts and perspectives concerning human groups; includes attention to socialization, culture, organization, stratification, and societies. Consideration of fundamental concepts and research methodology. (SS) (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: SOC 204H

SOC 205. *INSTITUTIONS AND SOCIAL CHANGE. (3 Credits)
Investigation of causes and consequences of social problems considered in societal context. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core

SOC 206. *SOCIAL PROBLEMS AND ISSUES. (3 Credits)
Examination of social problems with particular focus upon U.S. society. Sociological perspectives on definition, description, and analysis of contemporary and recurrent problems in industrialized societies. Investigation of causes and consequences of social problems considered in societal context. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core

SOC 241. INTRODUCTION TO CRIME AND JUSTICE. (3 Credits)
Provides a sociological understanding of criminal justice system institutions and processes. Emphasis is placed on understanding the criminal law; police and policing; courts and the prosecution process; and prisons, jails and corrections.

SOC 299. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: SOC 299H
This course is repeatable for 16 credits.

SOC 312. *SOCIOLOGY OF THE FAMILY. (4 Credits)
Survey of the family as a social institution. Addresses historical and cultural perspectives with emphasis on family diversity, variations in family form and life style, interdependence between family and other institutions, analysis of major family issues, forces for change in the family. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better
Equivalent to: SOC 312H

SOC 312H. *SOCIOLOGY OF THE FAMILY. (4 Credits)
Survey of the family as a social institution. Addresses historical and cultural perspectives with emphasis on family diversity, variations in family form and life style, interdependence between family and other institutions, analysis of major family issues, forces for change in the family. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Prerequisites: SOC 204 with D- or better orSOC 204H with D- or better
Equivalent to: SOC 312

SOC 313. SOCIOLOGY OF INTIMATE RELATIONSHIPS. (4 Credits)
Examines the microsociological dynamics of intimate relationships. Perceptions and expectations of intimate relationships are explored. Specific attention will be given to issues, processes, and factors that are involved in the construction and management of intimate relationships in contemporary society.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 315. *METHODS I: RESEARCH DESIGN. (4 Credits)
First in a two-course sequence required of all sociology majors. Students learn to formulate researchable questions, devise measures, select data collection techniques, and examine ethical and practical dilemmas in constructing sociological research. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 415
SOC 316. METHODS II: QUANTITATIVE ANALYSIS. (4 Credits)
Second in a two-course sequence required of all sociology majors.
The primary objective is to provide students with the statistical skills necessary to analyze sociological data. Covers the construction and interpretation of contingency tables, basic ideas of probability and statistical inference, and an introduction to correlation and regression.
Prerequisites: (SOC 204 with D- or better or SOC 204H with D- or better) and SOC 315 [C-]
Equivalent to: SOC 416

SOC 340. DEVIAN'T BEHAVIOR AND SOCIAL CONTROL. (4 Credits)
Current perspectives, research and theories of deviant behavior. Review and analysis of various approaches and programs designed to prevent and deal with deviant behavior.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 345. *CRIMES AND VIOLENCE IN INTIMATE RELATIONSHIPS. (4 Credits)
Analyzes the historical, social, political, legal, cultural, and psychological aspects of domestic violence, sexual assault, and stalking. Addresses definitions of the problem, demographics, survivors, perpetrators, witnesses, bystanders, strategies and tactics of abusers and survivors, along with strategies for prevention, intervention, treatment, and social change. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 350. HEALTH, ILLNESS AND SOCIETY. (4 Credits)
Social and cultural factors in the identification, course, and treatment of illness; analysis of selected health settings and professions.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 351. *SOCIOLOGY OF MENTAL ILLNESS. (4 Credits)
Focuses on how social and cultural context impact mental health, and how the very concepts of mental illness, abnormal or crazy are constructed in the first place, then applied by both “mental health” professionals and persons in their everyday lives. Examines major social models of “mental illness,” aiming to understand and evaluate their basic concepts and assumptions, as well as the response to “mental illness,” including how family, friends, troubled persons and professionals interpret, define and respond to “mental illness” and the processes shaping the policies and practices of the mental health enterprise.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 355. DEATH AND DYING. (4 Credits)
An overview of cross-cultural and historical attitudes and practices around end of life, death and dying. Assessment of contemporary legal, professional, cultural and technological issues surrounding end of life/ death and dying.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 360. *POPULATION TRENDS AND POLICY. (4 Credits)
Basic socio-demographic factors affecting population size, distribution, composition and change; examination of local, national, and international trends, and demographic policy. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 371. *SOCIAL MEDIA AND EVERYDAY LIFE. (4 Credits)
Examines key concepts, themes, and theories in the study of social media in today’s world. Interconnected themes include communication and the public sphere, self representation, power, and new technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

SOC 372. *POPULAR CULTURE. (4 Credits)
Critical examination of contemporary popular culture from a sociological perspective. Debates in the field of cultural sociology, including a critique of the distinction between 'high' and 'low' forms of culture, the social distinction between work and leisure time, the influence of society on individual patterns of consumption and personal taste, and the sociology of everyday life. Specific topics include mass media, sports, leisure activities, fashion, youth culture, science fiction, music, talk shows, soap operas, internet chat rooms, personal ads, home shopping, and folklore.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination

SOC 381. SOCIAL DIMENSIONS OF SUSTAINABILITY. (4 Credits)
Exploration of the social forces driving current views of sustainability. Specific attention will be given to values and belief systems, as well as social institutions in shaping sustainability issues related to ecologically sound, socially just, and economically viable outcomes.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 399. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 399H
This course is repeatable for 16 credits.

SOC 399H. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses.
Attributes: HNRS – Honors Course Designator
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
Equivalent to: SOC 399
This course is repeatable for 16 credits.

SOC 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 407. SEMINAR. (1-16 Credits)
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
This course is repeatable for 16 credits.

SOC 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 30 credits.

SOC 412. SOCIOLOGY OF WORK AND FAMILY. (4 Credits)
Survey of the intersections between families and work; variations in family structure, policies and paid and unpaid work in the United States; interdependence between paid and unpaid family labor and broader social change.

SOC 413. SOCIOLOGICAL THEORY. (4 Credits)
Historical and philosophical foundations of sociological theory; major schools of thought and their major contributors.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
SOC 418. QUALITATIVE RESEARCH METHODS. (4 Credits)
An introduction to the theory and methods of qualitative research. Students will be exposed to various qualitative research methods through practical field exercises. These include ethnographic field observation, content analysis, interviewing, focus groups and unobtrusive measures. Other commonly used methods of collecting qualitative data are also examined.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 422. SOCIOLOGY OF ORGANIZATIONS. (4 Credits)
Introduces sociological thinking about organizations in contemporary society with an emphasis on exploring the range of frameworks used to think about and explain modern organizations; applies knowledge to specific contemporary organizations.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 424. SOCIAL PSYCHOLOGY. (4 Credits)
Examines individuals in social context; explores dynamics of interpersonal relationships; evaluates link between self and society, including concepts of role/status/identity. Contemporary research design, problems, and findings pertinent to social psychology.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 426. *SOCIAL INEQUALITY. (4 Credits)
Evolution of social inequality in society. Emphasis upon the causes and consequences of inequality in power, privilege, and prestige in human societies, with special attention to the United States. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 430. GENDER AND SOCIETY. (4 Credits)
Examination of nature and consequences of social differentiation and stratification on the basis of sex and gender. Analysis of social position of women and men in society, focusing on their positions in institutional areas such as the family, politics, work and education. Evaluation of theories of biological, psychological, and sociological bases for the behavior and characteristics of women and men.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better

SOC 432. SOCIOLOGY OF AGING. (4 Credits)
Examination of the social significance of age, position and problems of the elderly in society; discusses the societal and individual consequences of an aging population; explores social theories of aging.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better

SOC 437. RACE AND ETHNIC RELATIONS. (4 Credits)
Comparative/international perspective on the social construction of race and ethnicity. Social, economic and political experiences of selected groups in the U.S. and other countries are examined.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 438. US IMMIGRATION ISSUES IN THE 21ST CENTURY. (4 Credits)
Provides a critical overview of immigration to the United States from a socio-historic perspective. Examines how successive waves of immigrants have influenced American society from the earliest groups of Europeans in the 19th century to the most recently arriving immigrants from Asia, Latin America and the Caribbean.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 439. WELFARE AND SOCIAL SERVICES. (4 Credits)
Analysis of social, political, and economic forces affecting welfare and social service systems, with overview of current programs, policy issues, public opinions, occupational aspects and societal impacts.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better or SOC 205 with D- or better or SOC 206 with D- or better

SOC 440. JUVENILE DELINQUENCY. (4 Credits)
Contemporary research and theories of juvenile delinquency. Review and evaluation of various strategies and programs designed to prevent delinquency or for treatment of delinquents.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 441. CRIMINOLOGY AND PENOLOGY. (4 Credits)
Review of sociological perspectives on crime and criminal justice, with emphasis upon North America. Review of crime statistics, types of crime, theories of criminality, corrections programs and prisons, and programs to reduce crime.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 442. SOCIOLOGY OF DRUG USE AND ABUSE. (4 Credits)
Emphasizes a sociological understanding of drug use, drug problems and drug policy. In order to understand drug use and abuse it is necessary to understand the chemical properties of the substances at issue, the attributes of the people who use and abuse drugs, and the norms and characteristics of the society in which the substance use occurs.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 444. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside ‘inside’ students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Prerequisites: SOC 204 with C or better
Equivalent to: SOC 444H

SOC 444H. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside ‘inside’ students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Attributes: HNRS – Honors Course Designator
Prerequisites: SOC 204 with C or better
Equivalent to: SOC 444

SOC 448. LAW AND SOCIETY. (4 Credits)
An introduction to social scientific approaches to law, covering major topics in the area. Topics may include digesting, legal consciousness, social movements and law, punishment, legal actors, and legal institutions.
Recommended: (SOC 204 or SOC 204H) with minimum grade of D-

SOC 449. LAW, CRIME, AND POLICY. (4 Credits)
Surveys criminal justice policies aimed at enforcing laws, reducing crime, punishing violators, and rehabilitating ex-offenders. Interrogates the behavioral assumptions used in creating and evaluating policies. Examines specific crimes and the policies used to address them.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better
SOC 450. SOCIOLOGY OF EDUCATION. (4 Credits)
Contemporary perspectives and research on schools, students, teachers and social forces affecting the educational system. Review of comparative and evaluation research on alternative educational strategies and programs. Overview of the literature of educational critics.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 452. SOCIOLOGY OF RELIGION. (4 Credits)
Social patterns within U.S. religious groups, relation of religious groups to society, and the methodological problems in studying such groups.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 453. SOCIOLOGY OF SPORT. (4 Credits)
Critical analysis of sport. Examines sport socialization; deviance; violence; gender; race/ethnicity; professional sport careers; intercollegiate athletics; marriage/family; and the media.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 454. *LEISURE AND CULTURE. (4 Credits)
Examination of the social, cultural, and global significance of leisure activity (in particular, tourism and recreation) from a historical perspective relative to attitudes, values, behaviors, and use of natural resources. (SS) (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; LACS – Liberal Arts Social Core
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 456. *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT. (4 Credits)
Study of social aspects of science and technology (values, practices, organization, impacts) by analysis of issues revealing their relationship to other social and cultural processes. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 460. THE SOCIOLOGY OF GLOBALIZATION. (4 Credits)
Examines the sociological effect of globalization on Western and non-Western societies. The course focuses on changes in the global economy and how this has influenced the social structure, patterns of change, and mutual influences among societies. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 466. INTERNATIONAL DEVELOPMENT: GENDER ISSUES. (4 Credits)
Examines roles and statuses of women and men throughout the world and differential impact of development on men and women. Evaluates traditional development policies and programs and discusses theories of gender stratification and of modernization. (NC)
Attributes: LACN – Liberal Arts Non-Western Core
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 470. COLLECTIVE BEHAVIOR. (4 Credits)
Examines current theories; focuses on behavior in crowds and diverse social settings including fads/fashions, ecstatic crowds/miracles, natural/technological disasters, urban legends, collective delusions/mass hysteria, protest/demonstrations, riots/mobs.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 471. *SOCIAL MOVEMENTS. (4 Credits)
Introduces core theoretical and methodological issues related to social movements in the US and abroad. Emphasizes social forces giving rise to movements, tactics employed by movements, and impacts of them on society.
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 472. GIVING AND VOLUNTARIISM. (4 Credits)
Examines concepts of donor motivation, giving, charity, voluntarism, philanthropy, and the nonprofit sector through the analysis of gender roles, ethnicity, power, status, and social institutions.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 475. RURAL SOCIOLOGY. (4 Credits)
Helps students understand the rich diversity in rural society, with an emphasis on the interdependencies between urban and rural contexts. Current issues and social problems experienced by rural populations and how sociology is used to understand and address issues affecting rural communities are explored.
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 480. *ENVIRONMENTAL SOCIOLOGY. (4 Credits)
Explores the evolution of environmental thought, paradigm shifts, and institutional structures associated with environmental concerns, social movements, and social impacts. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 481. *SOCIETY AND NATURAL RESOURCES. (4 Credits)
Explores the complex interrelationships between humans and natural resources, emphasizing how management decisions and organizations are enmeshed in social and cultural contexts. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: SOC 204 with D- or better or SOC 204H with D- or better

SOC 499. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students.
Equivalent to: SOC 490, SOC 499H
This course is repeatable for 16 credits.

SOC 499H. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students.
Attributes: HNRS – Honors Course Designator
Equivalent to: SOC 499
This course is repeatable for 16 credits.

SOC 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

SOC 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

SOC 510. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.
SOC 512. SOCIOLOGY OF WORK AND FAMILY. (4 Credits)
Survey of the intersections between families and work; variations in family structure, policies and paid and unpaid work in the United States; interdependence between paid and unpaid family labor and broader social change.
Recommended: SOC 204 or SOC 204H

SOC 513. SOCIOCY TOGY THEORY. (4 Credits)
Historical and philosophical foundations of sociological theory; major school of thought and their major contributors.
Recommended: SOC 204 or SOC 204H

SOC 515. UNDERSTANDING SOCIAL RESEARCH. (4 Credits)
Study of basic concepts and principles of qualitative and quantitative social research, including selection of general strategies and specific designs, conceptual and operational measurement, sample selection, data collection, data processing and analysis techniques, interpretation and reporting. Utilizes reports of social research in scholarly journals, popular media, and agency documents. Emphasis on critical evaluation and interpretation.
Equivalent to: PPOL 521

SOC 518. QUALITATIVE RESEARCH METHODS. (4 Credits)
An introduction to the theory and methods of qualitative research. Students will be exposed to various qualitative research methods through practical field exercises. These include ethnographic field observation, content analysis, interviewing, focus groups and unobtrusive measures. Other commonly used methods of collecting qualitative data are also examined.
Equivalent to: PPOL 523
Recommended: SOC 204 or SOC 204H

SOC 522. SOCIOLOGY OF ORGANIZATIONS. (4 Credits)
Introduces sociological thinking about organizations in contemporary society with an emphasis on exploring the range of frameworks used to think about and explain modern organizations; applies knowledge to specific contemporary organizations.
Recommended: SOC 204 or SOC 204H

SOC 524. SOCIAL PSYCHOLOGY. (4 Credits)
Examines individuals in social context; explores dynamics of interpersonal relationships; evaluates link between self and society, including concepts of role/status/identity. Contemporary research design, problems, and findings pertinent to social psychology.
Recommended: SOC 204 or SOC 204H

SOC 526. SOCIAL INEQUALITY. (4 Credits)
Evolution of social inequality in society. Emphasis upon the causes and consequences of inequality in power, privilege, and prestige in human societies, with special attention to the United States.
Recommended: SOC 204 or SOC 204H

SOC 530. GENDER AND SOCIETY. (4 Credits)
Examination of nature and consequences of social differentiation and stratification on the basis of sex and gender. Analysis of social position of women and men in society, focusing on their positions in institutional areas such as the family, politics, work and education. Evaluation of theories of biological, psychological, and sociological bases for the behavior and characteristics of women and men.
Recommended: SOC 204 or SOC 204H

SOC 532. SOCIOLOGY OF AGING. (4 Credits)
Examination of the social significance of age, position and problems of the elderly in society; discusses the societal and individual consequences of an aging population; explores social theories of aging.
Recommended: SOC 204 or SOC 204H

SOC 537. RACE AND ETHNIC RELATIONS. (4 Credits)
Comparative/international perspective on the social construction of race and ethnicity. Social, economic and political experiences of selected groups in the U.S. and other countries are examined.
Recommended: SOC 204 or SOC 204H

SOC 538. US IMMIGRATION ISSUES IN THE 21ST CENTURY. (4 Credits)
Provides a critical overview of immigration to the United States from a socio-historic perspective. Examines how successive waves of immigrants have influenced American society from the earliest groups of Europeans in the 19th century to the most recently arriving immigrants from Asia, Latin America and the Caribbean.

SOC 539. WELFARE AND SOCIAL SERVICES. (4 Credits)
Analysis of social, political, and economic forces affecting welfare and social service systems, with overview of current programs, policy issues, public opinions, occupational aspects and societal impacts.
Recommended: SOC 204 or SOC 204H or SOC 205 or SOC 206

SOC 540. JUVENILE DELINQUENCY. (4 Credits)
Contemporary research and theories of juvenile delinquency. Review and evaluation of various strategies and programs designed to prevent delinquency or for treatment of delinquents.
Recommended: SOC 204 or SOC 204H

SOC 541. CRIMINOLOGY AND PENOLOGY. (4 Credits)
Review of sociological perspectives on crime and criminal justice, with emphasis upon North America. Review of crime statistics, types of crime, theories of criminality, corrections programs and prisons, and programs to reduce crime.
Recommended: SOC 204 or SOC 204H

SOC 542. SOCIOLOGY OF DRUG USE AND ABUSE. (4 Credits)
Emphasizes a sociological understanding of drug use, drug problems and drug policy. In order to understand drug use and abuse it is necessary to understand the chemical properties of the substances at issue, the attributes of the people who use and abuse drugs, and the norms and characteristics of the society in which the substance use occurs.

SOC 544. INSIDE-OUT: PRISONS, COMMUNITIES, AND PREVENTION. (4 Credits)
Course takes place in a state correctional facility, with OSU students learning alongside 'inside' students from the facility for a full quarter. Course content examines prisons, communities, crime, and prevention from a sociological perspective. All students participate in service-learning projects.
Recommended: SOC 204

SOC 548. LAW AND SOCIETY. (4 Credits)
An introduction to social scientific approaches to law, covering major topics in the area. Topics may include disputing, legal consciousness, social movements and law, punishment, legal actors, and legal institutions.
Recommended: (SOC 204 or SOC 204H) with minimum grade of D-

SOC 549. LAW, CRIME, AND POLICY. (4 Credits)
Surveys criminal justice policies aimed at enforcing laws, reducing crime, punishing violators, and rehabilitating ex-offenders. Interrogates the behavioral assumptions used in creating and evaluating policies. Examines specific crimes and the policies used to address them.
Recommended: SOC 204 or SOC 204H
SOC 550. SOCIOLOGY OF EDUCATION. (4 Credits)
Contemporary perspectives and research on schools, students, teachers and social forces affecting the educational system. Review of comparative and evaluation research on alternative educational strategies and programs. Overview of the literature of educational critics.
Recommended: SOC 204 or SOC 204H

SOC 552. SOCIOLOGY OF RELIGION. (4 Credits)
Social patterns within U.S. religious groups, relation of religious groups to society, and the methodological problems in studying such groups.
Recommended: SOC 204 or SOC 204H

SOC 553. SOCIOLOGY OF SPORT. (4 Credits)
Critical analysis of sport. Examines sport socialization; deviance; violence; gender; race/ethnicity; professional sport careers; intercollegiate athletics; marriage/family; and the media.
Recommended: SOC 204 or SOC 204H

SOC 554. LEISURE AND CULTURE. (4 Credits)
Examination of the social, cultural, and global significance of leisure activity (in particular, tourism and recreation) from a historical perspective relative to attitudes, values, behaviors, and use of natural resources.
Recommended: SOC 204 or SOC 204H

SOC 556. SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT. (4 Credits)
Study of social aspects of science and technology (values, practices, organization, impacts) by analysis of issues revealing their relationship to other social and cultural processes.
Recommended: SOC 204 or SOC 204H

SOC 560. THE SOCIOLOGY OF GLOBALIZATION. (4 Credits)
Examines the sociological effect of globalization on Western and non-Western societies. The course focuses on changes in the global economy and how this has influenced the social structure, patterns of change, and mutual influences among societies.
Recommended: SOC 204 or SOC 204H

SOC 566. INTERNATIONAL DEVELOPMENT: GENDER ISSUES. (4 Credits)
Examines roles and statuses of women and men throughout the world and differential impact of development on men and women. Evaluates traditional development policies and programs and discusses theories of gender stratification and of modernization.
Recommended: SOC 204 or SOC 204H

SOC 570. COLLECTIVE BEHAVIOR. (4 Credits)
Examines current theories; focuses on behavior in crowds and diverse social settings including fads/fashions, ecstatic crowds/miracles, natural/technological disasters, urban legends, collective delusions/ mass hysteria, protest/demonstrations, riots/mobs.
Recommended: SOC 204 or SOC 204H

SOC 571. SOCIAL MOVEMENTS. (4 Credits)
Introduces core theoretical and methodological issues related to social movements in the US and abroad. Emphasizes social forces giving rise to movements, tactics employed by movements, and impacts of them on society.
Recommended: SOC 204 or SOC 204H

SOC 572. GIVING AND VOLUNTARISM. (4 Credits)
Examines concepts of donor motivation, giving, charity, voluntarism, philanthropy, and the nonprofit sector through the analysis of gender roles, ethnicity, power, status, and social institutions.
Recommended: SOC 204 or SOC 204H

SOC 575. RURAL SOCIOLOGY. (4 Credits)
Helps students understand the rich diversity in rural society, with an emphasis on the interdependencies between urban and rural contexts. Current issues and social problems experienced by rural populations and how sociology is used to understand and address issues affecting rural communities are explored.
Recommended: SOC 204 or SOC 204H

SOC 580. ENVIRONMENTAL SOCIOLOGY. (4 Credits)
Explores the evolution of environmental thought, paradigm shifts, and institutional structures associated with environmental concerns, social movements, and social impacts.
Recommended: SOC 204 or SOC 204H

SOC 581. SOCIETY AND NATURAL RESOURCES. (4 Credits)
Explores the complex interrelationships between humans and natural resources, emphasizing how management decisions and organizations are enmeshed in social and cultural contexts.
Recommended: SOC 204 or SOC 204H

SOC 599. SPECIAL TOPICS. (1-16 Credits)
Selected topics of special or current interest not covered in other courses. For advanced undergraduate and graduate students.
Equivalent to: SOC 590
This course is repeatable for 16 credits.
Recommended: SOC 204 or SOC 204H

SOC 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Software Engineering (SE)

SE 199. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

SE 201. SOFTWARE DEVELOPMENT I. (4 Credits)
Introduction to collaborative software development of larger, object-oriented systems. Overview of software architecture, and the tools, principles and practice of modern software development.
Prerequisites: CS 162 with C or better

SE 299. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

SE 303. SOFTWARE ENGINEERING III. (4 Credits)
Introduction to refactoring techniques and improving the quality and maintainability of software. Applying continuous integration and deployment tools; containers and virtual development environments.
Prerequisites: CS 362 with C or better

SE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

SE 467. BUSINESS OF SOFTWARE II. (4 Credits)
Become an entrepreneur. Start a real software business, from ideation to sales. Real-world, hands-on learning in a fast-paced startup environment. Development of product ideas, hypotheses, and business models to discover customers. Teamwork, management, and positioning for investment.
Prerequisites: CS 466 with C or better

SE 468. BUSINESS OF SOFTWARE III. (4 Credits)
Become an entrepreneur. Start a real software business, from ideation to sales. Real-world, hands-on learning in a fast-paced startup environment. Development of product ideas, hypotheses, and business models to discover customers. Teamwork, management, and positioning for investment.
Prerequisites: SE 467 with C or better
SE 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

**Soil Science (SOIL)**

**SOIL 101. INTRODUCTION TO CROP, SOIL, AND INSECT SCIENCE. (1 Credit)**
Introduces students with interests in crop, soil, and insect sciences to educational and professional opportunities in these disciplines. Speakers will discuss opportunities in research and academia as well as in the applied professional job market. CROSSLISTED as CROP 101/ENT 101 / SOIL 101.
Equivalent to: CROP 101, ENT 101, HORT 101

**SOIL 199. SPECIAL TOPICS. (1-16 Credits)**
Equivalent to: SOIL 199H
This course is repeatable for 16 credits.

**SOIL 199H. SPECIAL TOPICS. (1-16 Credits)**
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 199
This course is repeatable for 16 credits.

**SOIL 205. SOIL SCIENCE. (3 Credits)**
Introduction to the chemical, physical and biological nature of soils. Examines how soils function in terms of plant growth, nutrient supply, the global carbon cycle, ecological habitat, and water purification. Community-based learning projects provide hands-on experience with fundamental soil science principles and the impact of human activities on soil quality and sustainability. Lec. (Bacc Core Course if taken with SOIL 206 or FOR 206)

Attributes: CPBL – Core, Pers, BioSci Attached Lec; CPPL – Core, Pers, PhySci Attached Lec
Prerequisites: SOIL 206 (may be taken concurrently) with D- or better or FOR 206 (may be taken concurrently) with D- or better
Equivalent to: CSS 205, CSS 305

**SOIL 206. *SOIL SCIENCE LABORATORY FOR SOIL 205. (1 Credit)**
Students will gain hands-on experience with soil science concepts and applications. Laboratory exercises and field trips will help students develop proficiency in the methods/tools for analyzing soil chemistry, biology, morphology, physical properties, and soil forming factors. Skills will be taught in the context of soils’ social, economic, and environmental importance. (Bacc Core Course if taken with SOIL 205)

Attributes: CPBS – Core, Pers, Biological Science; CPPS – Core, Pers, Physical Science
Corequisites: SOIL 205

**SOIL 299. SPECIAL TOPICS. (1-16 Credits)**
Equivalent to: SOIL 299H
This course is repeatable for 16 credits.

**SOIL 299H. SPECIAL TOPICS. (1-16 Credits)**
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 299
This course is repeatable for 16 credits.

**SOIL 316. NUTRIENT CYCLING IN AGROECOSYSTEMS. (4 Credits)**
Nutrient forms, transformations, and cycling. Diagnosis and correction of nutrient deficiencies, pH and salinity. Impact of nutrient management practices on crop production, soil health, nutrient use efficiency, and environmental quality. Organic and inorganic fertilization. Labs include soil sampling and testing procedures, data collection on soil and plants, computer applications for soil fertility management, and field trips. Lec/ lab.
Prerequisites: (CH 121 with D- or better or CH 231 with D- or better) and (SOIL 205 [C] or CSS 205 [C] or CSS 305 [C])
Equivalent to: CSS 316

**SOIL 360. SOIL MANAGEMENT FOR ORGANIC PRODUCTION. (3 Credits)**
This is a skills-based soil management course that is part lecture and part student-centered learning. Significant class time will be devoted to making field-scale management decisions. The course includes individual and group work, presentation, and discussion. The intent is to prepare students for real-world application of soil management decisions in certified organic systems. Using the National Organic Program as a starting point as well as farm system descriptions with extensive long-term data sets, we will interpret soil nutrient analyses, cover cropping systems, and organic amendments, to design soil management plans for two model cropping systems (annual and perennial).
Prerequisites: (SOIL 205 with C or better and (SOIL 206 [C] or FOR 206 [C]) or CSS 205 [C])
Recommended: Introductory soil science course with lab

**SOIL 366. ECOSYSTEMS OF WILDLAND SOILS. (3 Credits)**
Focuses on soils that occur in relatively undisturbed ecosystems such as forests and rangelands. Topics covered include properties and processes specific to understanding and managing the soil resource in these areas. An overview of US Soil Taxonomy will also be given.
Prerequisites: SOIL 205 with D- or better or CSS 205 with D- or better or CSS 305 with D- or better
Recommended: An understanding and appreciation of environmental chemistry, biology, ecology, and physics

**SOIL 388. SOIL SYSTEMS AND PLANT GROWTH. (4 Credits)**
Introduces soils as providers of critical resources for plant growth. Explains how soils supply water, air, thermal energy and nutrients to plants. Shows that sustainable management of soil resources requires substantial understanding of their role in the functioning of natural, forest, and agricultural systems. Explains controls on stocks and availabilities of individual soil resources and mechanisms making these resources plant-available.
Prerequisites: ((SOIL 205 with D- or better and (SOIL 206 [D-] or FOR 206 [D-]) or CSS 205 [D-]) and (CH 121 [D-] or CH 231 [D-]) and (BOT 220 [D-] or (BI 204 [D-] or BI 205 [D-]) or BI 206 [D-]) or (BI 211 [D-] or BI 212 [D-] or BI 213 [D-]))
SOIL 395. WORLD SOIL RESOURCES. (3 Credits)
The properties, global distribution, and agricultural productivity of major
world soil groups are described. Potentials for human-accelerated
soil degradation are introduced for each soil group, and reasons for
conflicting assessments of degradation are discussed. Offered via
Ecampus only. (Bacc Core Course) (Writing Intensive Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; CWIC –
Core, Skills, WIC
Prerequisites: CH 121 with D- or better or CH 122 with D- or better or
CH 123 with D- or better or CH 201 with D- or better or CH 202 with D-
or better or CH 231 with D- or better or CH 231H with D- or better or CH 232
with D- or better or CH 232H with D- or better or CH 233 with D- or better
or CH 233H with D- or better
Equivalent to: CSS 395
Recommended: One term of chemistry

SOIL 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 401. RESEARCH. (1-16 Credits)
Equivalent to: CSS 401
This course is repeatable for 16 credits.

SOIL 403. THESIS. (1-16 Credits)
Independent, original study and preparation of a senior thesis.
Equivalent to: CSS 403
This course is repeatable for 16 credits.

SOIL 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: SOIL 405H
This course is repeatable for 16 credits.

SOIL 405H. READING AND CONFERENCE. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 405
This course is repeatable for 16 credits.

SOIL 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 408. WORKSHOP. (1-16 Credits)
Evaluation and judging of soils in Oregon and other states; directed
studies of soil morphology, soil survey, soil fertility, soil physics, soil
chemistry, soil biology, and soil information systems.
Equivalent to: CSS 408
This course is repeatable for 16 credits.

SOIL 409. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 410. INTERNSHIP. (1-6 Credits)
Professional work experience previously approved and supervised by the
department, written report required.
Equivalent to: CSS 410
This course is repeatable for 12 credits.

SOIL 435. ENVIRONMENTAL SOIL PHYSICS. (3 Credits)
Covers principles of soil physical properties and processes as they relate
to agricultural, hydrological and environmental problems. Lec/lab. Offered
odd years.
Prerequisites: CSS 205 with D- or better or CSS 305 with D- or better or
SOIL 205 with D- or better
Equivalent to: CSS 435
Recommended: CH 123 and MTH 241 and PH 201

SOIL 445. ENVIRONMENTAL SOIL CHEMISTRY. (3 Credits)
Structural chemistry of clay minerals and organic matter, cation and
anion exchange, and soil solution equilibria of soils. Ion exchange,
mineral-solution equilibria, and adsorption reactions of silicate clays,
oxides, and organic matter are emphasized. Covers the sorption behavior
of environmental contaminants and the weathering reactions that govern
the transport of reactive solutes through soils. Lec/rec. Offered odd
years.
Equivalent to: CSS 445

SOIL 455. BIOLOGY OF SOIL ECOSYSTEMS. (4 Credits)
A detailed study of the organisms that live in the soil and their activities
in the soil ecosystems, soil as a habitat for organisms, taxonomy and
biology of soil organisms, fundamentals of nutrient cycles, special topics
in soil biology, review basis of soil microbial and ecological principles.
Lec/rec/lab.
Equivalent to: CSS 455
Recommended: (CSS 305 or CSS 205 or SOIL 205). Courses in chemistry,
physics, and microbiology

SOIL 466. SOIL MORPHOLOGY AND CLASSIFICATION. (4 Credits)
Observation and description of soil properties in the field; writing soil
profile descriptions; evaluating criteria that define features used to
classify soils; using soil classification keys. Lec/lab.
Prerequisites: SOIL 205 with D- or better or CSS 205 with D- or better or
CSS 305 with D- or better
Equivalent to: CSS 466

SOIL 468. SOIL LANDSCAPE ANALYSIS. (4 Credits)
Principles of soil geomorphology, soil stratigraphy, and surficial
processes as applied to understanding the soil system and landscape
scales. Emphasis on field observations of soils, geomorphic surfaces,
and environment. Field project entails design of soil survey map units,
field mapping and GIS cartographic techniques. Lec/lab. Offered even
years.
Prerequisites: SOIL 466 (may be taken concurrently) with D- or better or
CSS 466 (may be taken concurrently) with D- or better
Equivalent to: CSS 468

SOIL 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: SOIL 499H
This course is repeatable for 16 credits.

SOIL 499H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: SOIL 499
This course is repeatable for 16 credits.

SOIL 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 503. THESIS/DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

SOIL 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
SOIL 508. WORKSHOP. (1-16 Credits)
Evaluation and judging of soils in Oregon and other states; directed studies of soil morphology, soil survey, soil fertility, soil physics, soil chemistry, soil biology, and soil information systems.
Equivalent to: CSS 508
This course is repeatable for 16 credits.

SOIL 509. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. CROSSLISTED as CROP 509/ENT 509/ PBG 509/SOIL 509.
Equivalent to: CROP 509, ENT 509, PBG 509
This course is repeatable for 9 credits.

SOIL 510. INTERNSHIP. (1-6 Credits)
Professional work experience previously approved and supervised by the department, written report required.
This course is repeatable for 6 credits.

SOIL 511. SOIL: A NATURAL AND SOCIETAL RESOURCE. (3 Credits)
Serves degree- and non-degree-seeking graduate learners wanting soil science knowledge but having minimal science background.
Understanding soil physical, chemical, and biological properties promotes informed soil management while supporting individual to global societal values. Established curriculum facilitates graduate degrees or certificates, continuing education, professional certification, and self-improvement goals. A highly interactive social media framework supports weekly student-student and instructor-student learning interactions.

SOIL 512. METHODS OF SOIL ANALYSIS - FIELD. (1 Credit)
Recognition and quantitative description of soil properties in agroecosystems. Assessments of soil environments used for crop production in Oregon. Demonstration and practice of volumetric and bulk soil sampling techniques as well as the application of pedotransfer functions. Each participant will be responsible for analyzing at least one soil sample in the chemical level. Five-day duration with four overnight stays at campgrounds. Participants will use their own or borrowed camping equipment.
Recommended: SOIL 205 with a minimum grade of C

SOIL 514. METHODS OF SOIL ANALYSIS - LABORATORY. (2 Credits)
Provide the theoretical background, as well as practical experience needed to plan, select, execute, and interpret soil chemical and physical analyses such as those typically used for nutrient management recommendations. Individual and group activities involve classroom presentations, as well as hands-on work in a teaching laboratory. Samples processed are those collected in SOIL 512, Methods of Soil Analysis - Field. Duration is five full work days.
Prerequisites: SOIL 512 (may be taken concurrently) with C or better
Recommended: SOIL 205 and successful completion of EH&S Laboratory

SOIL 515. SOIL FERTILITY MANAGEMENT. (3 Credits)
Management of plant nutrients in agronomic systems; diagnosis of nutrient availability and prediction of crop response to fertilizers; interactions between nutrient response and chemical, physical and biological properties of soils.
Equivalent to: CSS 515
Recommended: CSS 315 and courses in statistics, chemistry and plant physiology.

SOIL 523. PRINCIPLES OF STABLE ISOTOPES. (3 Credits)
An introduction to the theory and use of stable isotopes. Applications of stable isotopes to soil science, plant physiology, hydrology, and ecosystem studies. Offered even years.
Equivalent to: CSS 523

SOIL 525. MINERAL-ORGANIC MATTER INTERACTIONS. (3 Credits)
Studies the fundamental properties of the mineral-organic interface and the mechanisms of interaction between mineral and organic soil properties.
Equivalent to: CSS 525
Recommended: CSS 305 or CSS 205 or SOIL 205

SOIL 530. ORGANIC SOIL AND CROP MANAGEMENT. (3 Credits)
Overview of organic soil and crop management, organic soil system management, soil microbiology under organic systems, cropping systems, organic cereal production systems, organic forage production system, organic horticultural systems management, organic field and horticulture cropping systems; recent research and case studies. CROSSLISTED as CROP 530/SOIL 530.
Equivalent to: CROP 530
Recommended: (SOIL 525, CROP 200 and SOIL 205 or introductory biology) and completion or concurrent enrollment in AGRI 520

SOIL 535. SOIL PHYSICS. (3 Credits)
Theoretical elements of soil physical properties and processes related to agricultural, hydrological and environmental problems. Offered fall term in even years.
Equivalent to: CSS 535
Recommended: CSS 305, CSS 205, SOIL 205, MTH 241, CH 123, PH 201

SOIL 536. VADOSE ZONE HYDROLOGY LABORATORY. (1 Credit)
Experimental elements of soil physical properties and processes allowing practical experience in the measurement and analysis of soil physical processes related to agricultural, hydrological and environmental problems. Weekly laboratory. Offered even years.
Equivalent to: CSS 536
Recommended: CH 123 and PH 201

SOIL 545. ENVIRONMENTAL SOIL CHEMISTRY. (3 Credits)
Structural chemistry of clay minerals and organic matter, cation and anion exchange, and soil solution equilibria of soils. Ion exchange, mineral-solution equilibria, and adsorption reactions of silicate clays, oxides, and organic matter are emphasized. Covers the sorption behavior of environmental contaminants and the weathering reactions that govern the transport of reactive solutes through soils. Lec/rec. Offered odd years.
Equivalent to: CSS 545

SOIL 547. NUTRIENT CYCLING. (3 Credits)
Reviews and discusses ecosystem-level biogeochemical concepts for terrestrial and freshwater ecosystems, primarily by reading and discussing classic and current literature to determine the state-of-knowledge and uncertainties associated with it. Topics include root nutrient uptake mechanisms, soil chemical and biochemical transformations in different soil and ecosystems, measuring soil solution and watershed fluxes, soil organic matter formation and structure, the meaning of sustainability, the concept of N saturation in terrestrial ecosystems, and the use of natural abundance and tracer isotopes in ecosystem biogeochemistry. While forest biogeochemical processes will be emphasized, desert, aquatic, wetland, and prairie ecosystems will also be explored. CROSSLISTED as BOT 547/SOIL 547.
Equivalent to: BOT 547, FS 547
Recommended: College-level chemistry and biology and one class in ecology (eg. BI 370) and/or soils (eg. SOIL 205)
SOIL 555. BIOLOGY OF SOIL ECOSYSTEMS. (4 Credits)
A detailed study of the organisms that live in the soil and their activities in the soil ecosystems, soil as a habitat for organisms, taxonomy and biology of soil organisms, fundamentals of nutrient cycles, special topics in soil biology, review basis of soil microbial and ecological principles. Lec/rec/lab.
Equivalent to: CSS 555
Recommended: CSS 305 or CSS 205 or SOIL 205. Courses in chemistry, physics, and microbiology

SOIL 556. SOIL MORPHOLOGY AND CLASSIFICATION. (4 Credits)
Observation and description of soil properties in the field; writing soil profile descriptions; evaluating criteria that define features used to classify soils; using soil classification keys. Lec/lab.
Equivalent to: CSS 566
Recommended: CSS 305 or CSS 205 or SOIL 205

SOIL 566. SOIL LANDSCAPE ANALYSIS. (4 Credits)
Principles of soil geomorphology, soil stratigraphy, and surficial processes as applied to understanding the soil system at landscape scales. Emphasis on field observations of soils, geomorphic surfaces, and environment. Field project entails design of soil survey map units, field mapping and GIS cartographic techniques. Lec/lab. Offered odd years.
Prerequisites: CSS 566 (may be taken concurrently) with C or better or SOIL 566 (may be taken concurrently) with C or better
Equivalent to: CSS 568

SOIL 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 603. THESIS/DISSERTATION. (1-16 Credits)
This course is repeatable for 999 credits.

SOIL 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

SOIL 609. PRACTICUM IN TEACHING. (1-3 Credits)
Developing skills and competence in teaching under staff supervision; organization and presentation of instructional material by assisting in laboratory, recitation, and lectures. Graded P/N.
Equivalent to: CROP 609, ENT 609, PBG 609
This course is repeatable for 9 credits.

SOIL 635. ADVANCED SOIL PHYSICS. (3 Credits)
Explores theoretical development of a key topic in soil physics. Topics may include evaporation from porous media, multiphase fluid movement, soil deformation, and soil salinization, with respect to either historical development, present day understanding or future needs of the field. Course structure incorporates lectures and discussion requiring intensive student participation. Offered odd years.
Prerequisites: CSS 535 with C or better or SOIL 535 with C or better
Recommended: A working knowledge of soil physics and a passing grade in a graduate-level soil physics course

SOIL 645. SOIL MICROBIAL ECOLOGY. (3 Credits)
An advanced treatment of current topics in soil microbiology, with an emphasis on the ecology of soil microorganisms. Topics include the size, composition, diversity, and activity of soil microbial communities, linkage of microbial community structure to ecosystem functions, and applications of molecular biology to soil microbiology. Offered even years.
Equivalent to: CSS 645
Recommended: SOIL 455 or CSS 455 or MB 448

SOIL 684. GLOBAL BIOGEOCHEMICAL CYCLES. (4 Credits)
An in-depth treatment of global biogeochemical cycles, focusing on cycles of carbon, oxygen, nitrogen, phosphorus, and sulfur in the atmosphere, hydrosphere, and lithosphere. CROSSLISTED as GEO 684/ SOIL 684.
Equivalent to: GEO 684
Recommended: One year of college-level physics and chemistry, including introductory biology. One year of graduate coursework in soil, earth, ocean, atmospheric or forest science

SOIL 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Spanish (SPAN)

SPAN 111. FIRST-YEAR SPANISH. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Native speakers and bilingual speakers will not receive credit for SPAN 111, SPAN 112, SPAN 113. Lec/rec.

SPAN 112. FIRST-YEAR SPANISH. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Native speakers and bilingual speakers may not receive credit for SPAN 111, SPAN 112, SPAN 113. Lec/rec.
Prerequisites: SPAN 111 (may be taken concurrently) with D- or better or placement test

SPAN 113. FIRST-YEAR SPANISH. (4 Credits)
Development of listening comprehension, speaking, reading, and writing skills. Native speakers and bilingual speakers may not receive credit for SPAN 111, SPAN 112, SPAN 113. Lec/rec.
Prerequisites: SPAN 112 with D- or better or placement test

SPAN 117. FIRST-YEAR SPANISH-COMPLETE SEQUENCE. (12 Credits)
Introduction to Spanish. Listening, speaking, reading, and writing skills developed. Students must take all twelve credits. Entire first-year sequence in eight weeks.
Equivalent to: SPAN 111, SPAN 112, SPAN 113

SPAN 188. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.

SPAN 199. SPECIAL STUDIES. (1-3 Credits)
May be repeated for a maximum of 3 credits.
This course is repeatable for 9 credits.

SPAN 211. SECOND-YEAR SPANISH. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers will not receive credit for SPAN 211, SPAN 212, SPAN 213.
Prerequisites: SPAN 113 with D- or better or placement test
SPAN 212. SECOND-YEAR SPANISH. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers may not receive credit for SPAN 211, SPAN 212, SPAN 213.
Prerequisites: SPAN 211 with D- or better or placement test

SPAN 213. SECOND-YEAR SPANISH. (4 Credits)
Further development of listening comprehension, speaking, reading, and writing skills. Native speakers may not receive credit for SPAN 211, SPAN 212, SPAN 213. Completion if SPAN 213 with a grade of C- or better satisfies BA requirement for foreign languages.
Prerequisites: SPAN 212 with D- or better or placement test

SPAN 214. SECOND-YEAR SPANISH FOR NATIVE SPEAKERS. (4 Credits)
Designed for native speakers who learned Spanish in a home environment. Introduction to written Spanish.
Recommended: SPAN 215

SPAN 215. SECOND-YEAR SPANISH FOR NATIVE SPEAKERS. (4 Credits)
Designed for native speakers who learned Spanish in a home environment. Introduction to written Spanish.
Recommended: SPAN 214

SPAN 217. SECOND-YEAR SPANISH-COMPLETE SEQUENCE. (12 Credits)
Intermediate Spanish. Listening, speaking, reading, and writing skills developed. Students must take all 12 credits. Entire second-year sequence in eight weeks.
Recommended: SPAN 113 or SPAN 117

SPAN 221. SPANISH FOR MEDICAL PROFESSIONS I. (4 Credits)
Provides students in health science and pre-professional disciplines with a working knowledge of Spanish used in health sciences and cultural competency needed to serve Latino populations.
Prerequisites: SPAN 113 with C- or better

SPAN 222. SPANISH FOR MEDICAL PROFESSIONS II. (4 Credits)
Provides students in health science and pre-professional disciplines with a working knowledge of Spanish used in health sciences and cultural competency needed to serve Latino populations.
Prerequisites: SPAN 221 with C- or better

SPAN 236. *CONTEMPORARY LATIN AMERICAN CULTURE. (3 Credits)
Students will examine the main currents of modern Latin American culture since the beginning of the 20th century. Key subjects covered include the mural movement, ‘magical realism’ in postwar literature, syncretism in the region’s music and religion, and environmentalism in literature and the arts. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts

SPAN 237. *U.S. LATINO/A IDENTITIES AND CULTURES. (3 Credits)
An introduction to past and contemporary experiences of Latinos/as in the U.S. related to patterns of (im)migration as well as sociohistorical and political events that have shaped U.S. Latino identities. In addition, the course will explore the current social, political, economic and cultural status and experiences of Latinos/as in different regions of the United States. (Taught in English) (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity

SPAN 288. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language; Section 2: Practical work (exercises); Section 3: Topics, Hispanic arts and letters; Section 4: Topics, Hispanic society.
This course is repeatable for 12 credits.

SPAN 299. SPECIAL STUDIES. (1-3 Credits)
This course is repeatable for 9 credits.

SPAN 311. ADVANCED SPANISH GRAMMAR. (3 Credits)
Students further develop language skills acquired in earlier courses while studying more complex structural aspects of the language through the application of grammar concepts in composition and other language tasks.
Prerequisites: SPAN 213 with C- or better or placement test
Equivalent to: SPAN 314

SPAN 312. INTERMEDIATE WRITING SKILLS. (3 Credits)
Focuses on written communication in Spanish. Authentic texts are used to identify writing processes and products and see how composition is informed by cultural considerations. Special attention will be paid to the author’s purpose and the distinctiveness of the target audience. Students will create original written works and reinforce oral communication skills through class discussions.
Prerequisites: SPAN 213 with C- or better or placement test
Equivalent to: SPAN 314

SPAN 313. SPANISH LANGUAGE THROUGH CULTURE. (3 Credits)
Development of Spanish language through an exploration of cultural products, perspectives and practices of Spanish-speaking communities around the world.
Equivalent to: SPAN 316
Recommended: SPAN 213

SPAN 314. THIRD-YEAR SPANISH FOR NATIVE SPEAKERS. (3 Credits)
Extensive practice in reading, writing, and speaking; refinement of spelling, grammar and vocabulary within a dynamic cultural context. Native speakers should take SPAN 314, SPAN 315, SPAN 316 instead of SPAN 311, SPAN 312, SPAN 313; credit is not allowed for both.
Equivalent to: SPAN 315
Recommended: SPAN 216

SPAN 315. THIRD-YEAR SPANISH FOR NATIVE SPEAKERS. (3 Credits)
Extensive practice in reading, writing, and speaking; refinement of spelling, grammar and vocabulary within a dynamic cultural context. Native speakers should take SPAN 314, SPAN 315, SPAN 316 instead of SPAN 311, SPAN 312, SPAN 313; credit is not allowed for both.
Equivalent to: SPAN 316
Recommended: SPAN 317

SPAN 316. THIRD-YEAR SPANISH FOR NATIVE SPEAKERS. (3 Credits)
Extensive practice in reading, writing, and speaking; refinement of spelling, grammar and vocabulary within a dynamic cultural context. Native speakers should take SPAN 314, SPAN 315, SPAN 316 instead of SPAN 311, SPAN 312, SPAN 313; credit is not allowed for both.
Equivalent to: SPAN 317
Recommended: SPAN 315

SPAN 317. DIRECTED READING AND WRITING IN SPANISH. (3 Credits)
Emphasis on reading comprehension and improving writing ability. Students will build on their language skills and cultural awareness using different forms of literary expression from the Spanish-speaking world.
Equivalent to: SPAN 327
Recommended: 9 credits of upper-division Spanish
SPAN 318. INTRODUCTION TO SPANISH LANGUAGE LITERATURE. (3 Credits)
Provides the literary background and analytical tools for students to discuss Spanish language literature with some depth and prepares students for more advanced literature courses. Some discussion of Latin American and Spanish history, politics and culture will provide a context for the readings.
Recommended: 9 credits of upper-division Spanish

SPAN 319. SPANISH FOR BUSINESS. (3 Credits)
Recommended: SPAN 312

SPAN 320. SPANISH CONVERSATION. (3 Credits)
Extensive listening and speaking practice in Spanish, and systematic contact with Latin culture. Emphasis on vocabulary, pronunciation, intonation, and comprehension. Native speakers of Spanish are not eligible to take this course. May be used to satisfy requirements for the major or minor.
Recommended: 6 credits of upper-division Spanish.

SPAN 327. MEXICAN-AMERICAN LITERATURE AND COMPREHENSIVE FOR SPANISH HERITAGE LANGUAGE LEARNERS. (3 Credits)
Combines the study of fiction, drama, and poetry in Spanish language produced by people of Mexican origin in what is today the United States, with intensive practice in the writing of formal Spanish. Students are encouraged to develop their independent thinking and analytical ability. Designed for students from a Spanish-speaking background.
Equivalent to: SPAN 317
Recommended: SPAN 316

SPAN 331. *THE CULTURES OF SPAIN AND PORTUGAL. (3 Credits)
Historical development of the cultures and societies of the Iberian Peninsula. Taught in Spanish. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 332. *THE CULTURES OF SPAIN AND PORTUGAL. (3 Credits)
Historical development of the cultures and societies of the Iberian Peninsula. Taught in Spanish. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 333. CULTURES OF SPAIN AND PORTUGAL. (3 Credits)
Historical development of the cultures and societies of today's Iberian Peninsula. Taught in Spanish.
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 336. *LATIN AMERICAN CULTURE. (3 Credits)
Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 337. *LATIN AMERICAN CULTURE. (3 Credits)
Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 338. *LATIN AMERICAN CULTURE. (3 Credits)
Historical development of the cultures and societies of Latin America, with an emphasis on Spanish- and Portuguese-speaking peoples. Taught in Spanish. (H) (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 339. MEXICAN IMMIGRANT EXPERIENCE IN THE UNITED STATES. (3 Credits)
An interdisciplinary analysis of the immigration from Mexico to the United States. It will include discussions of literary, cultural and political accounts. Emphasis on the development of presentational communication skills in Spanish. Taught in Spanish.
Recommended: 12 credits from SPAN 314, SPAN 315, SPAN 316, SPAN 317, SPAN 318, SPAN 331, SPAN 332, SPAN 336, SPAN 337, SPAN 338.

SPAN 344. SELECTED TOPICS IN LITERATURE. (3 Credits)
Taught in Spanish. May be repeated for credit when topic varies. This course is repeatable for 9 credits.
Recommended: Completion of 9 credits from SPAN 311, SPAN 312, SPAN 313, SPAN 317, SPAN 318.

SPAN 350. PHONETICS AND PRONUNCIATION. (3 Credits)
An exploration of the organs of speech and hearing, acoustic analysis, and transcription of native and learner Spanish speech samples.
Recommended: 3 credits of upper-division Spanish.

SPAN 351. HISPANIC LINGUISTICS. (3 Credits)
Recommended for teacher certification.
Recommended: SPAN 350

SPAN 379. PROCTOR EXPERIENCE. (1 Credit)
Supervised practicum for advanced students, with assignments as proctors or tutors in lower-division Spanish language courses. No more than 2 credits may be used to satisfy degree requirements for a major in Spanish; no credit may be used to satisfy requirements for a minor in Spanish. Graded P/N.
This course is repeatable for 3 credits.
Recommended: Completion of 21 upper-division credits in Spanish with a minimum 3.00 GPA.

SPAN 388. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises). Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.
This course is repeatable for 12 credits.

SPAN 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
**SPAN 402. INDEPENDENT STUDY. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**SPAN 403. THESIS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**SPAN 405. READING AND CONFERENCE. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**SPAN 407. SEMINAR. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**SPAN 410. INTERNSHIP. (1-15 Credits)**

*This course is repeatable for 15 credits.*

**SPAN 411. SPECIALIZED GRAMMAR OR LINGUISTICS TOPICS. (3 Credits)**

Students develop an in-depth knowledge of various linguistic aspects of Spanish, particularly in regard to problematic grammatical structures and the development of writing proficiency. The main focus is on integrating a thorough understanding of grammatical structures into writing using selected literary works as models. Students analyze their own linguistic progress and apply this meta-knowledge to their writing.

*Recommended: 18 credits of upper-division Spanish.*

**SPAN 412. ADVANCED COMPOSITION. (3 Credits)**

Emphasis on creative writing. Students will read and discuss a series of stories with the same theme, then write their own. The subjunctive and other advanced grammar topics will be reviewed and incorporated into the writing activities. Taught in Spanish.

*Recommended: 18 credits of upper-division Spanish*

**SPAN 413. ADVANCED COMMUNICATION SKILLS. (3 Credits)**

Contextualized exploration of skills outlined in the National Standards Project’s.

*Recommended: 18 credits of upper-division Spanish*

**SPAN 435. SPECIAL TOPICS IN LATIN AMERICAN CULTURE. (3 Credits)**

Historical and contemporary aspects of the cultures of Latin America. May include material relevant to Spain and U.S. Latinos. May be repeated for credit when topic varies.

*This course is repeatable for 9 credits.*

*Recommended: 18 credits of upper-division Spanish*

**SPAN 438. *SELECTED TOPICS IN LUSO-HISPANIC CULTURE. (3 Credits)**

Contemporary aspects of the cultures of Spain, Portugal, or Latin America with a cross-cultural perspective. Topics and language of instruction vary. May be repeated for credit when topic varies.

*Writing Intensive Course*

*Attributes: CWIC – Core, Skills, WIC This course is repeatable for 9 credits.*

*Recommended: Completion of 6 credits from SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338.*

**SPAN 439. TOPICS IN MEXICAN CULTURE AS EVIDENCED THROUGH MEXICAN FILM. (3 Credits)**

Critical analysis and evaluation of films as cultural texts that open up a window into Mexican society. Movies with strong sexual content, explicit violence, language, and/or drug use will be viewed in the class. Taught in Spanish with some readings in English. May be repeated for credit when topic varies. Not offered every year.

*This course is repeatable for 9 credits.*

*Recommended: Completion of 12 credits from SPAN 316, SPAN 317, SPAN 318, SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338, SPAN 339, SPAN 411, SPAN 412, SPAN 413 with a minimum grade of B-.

**SPAN 441. CONTEMPORARY SHORT STORY. (3 Credits)**

An exploration and comparison of the short story in its various manifestations across the Spanish-speaking world in the 20th and 21st centuries. Themes such as identity, discrimination, class conflict, language, power, resistance, and marginalization will be analyzed within the socio-historical contexts in which the literary works were created.

*Recommended: At least 12 credits of upper-division Spanish.*

**SPAN 444. SELECTED TOPICS IN THE LITERATURE OF SPAIN. (3 Credits)**

Representative Spanish prose, poetry, and drama, with an emphasis on the 19th and 20th centuries. Taught in Spanish. See Schedule of Classes for current term offering. May be repeated for credit when topic varies. Not offered every year.

*This course is repeatable for 12 credits.*

*Recommended: Completion of 21 upper-division credits in Spanish.*

**SPAN 445. SELECTED TOPICS IN THE LITERATURE OF LATIN AMERICA. (3 Credits)**

Representative prose, poetry, and drama of Spanish America and/or Brazil, with an emphasis on the mid-19th century to the present. Topics and language of instruction may vary. See Schedule of Classes for current term offering. May be repeated for credit when topic varies. Not offered every year.

*This course is repeatable for 18 credits.*

*Recommended: Completion of 21 upper-division credits in Spanish.*

**SPAN 446. RECENT LATIN AMERICAN LITERATURE. (3 Credits)**

Recent fiction that goes beyond Magical Realism. Discussion includes literary techniques, as well as Latin American history, politics and cultural values. Taught in Spanish.

*Recommended: Completion of 21 upper-division credits of Spanish.*

**SPAN 447. MEXICAN WOMEN WRITERS. (3 Credits)**

Fiction by contemporary Mexican women, emphasizing how the writing reflects the authors’ lives, as well as Mexican history, politics and cultural values. Taught in Spanish.

*Recommended: Completion of 21 upper-division credits of Spanish.*

**SPAN 448. LATIN AMERICAN GREAT WORKS. (3 Credits)**

Major works by Latin American writers, concentrating on literary style and technique, as well as Latin American history, politics and culture. Taught in Spanish.

*Recommended: Completion of 21 upper-division credits of Spanish.*

**SPAN 453. SPANISH SOCIOLINGUISTICS. (3 Credits)**

Provides a foundation of sociolinguistic theory from which various topics can be analyzed, discussed and applied to language situations that are specific to Spanish. These include language contact, Spanish varieties, language policy, and language attitudes. All topics are presented within the context of speech communities and the external and internal variables that affect these communities.

*Prerequisites: SPAN 350 with C- or better*

**SPAN 455. INTRODUCTION TO SPANISH TRANSLATION. (3 Credits)**

Combines beginning translation theory with hands-on practice using a variety of activities from several areas of professional specialization. Includes a brief introduction to simultaneous interpretation as it is done in professional conference or broadcast media settings. Participants must be highly proficient in both English and Spanish.

*Recommended: 12 credits of upper-division Spanish.*
SPAN 456. SPANISH IN THE UNITED STATES. (3 Credits)
Provides a foundation for the study of Spanish in the United States. Focuses on the diverse identities of Latino/as and Spanish speakers as they define what it means to be bilingual locally, regionally, and nationally. Spanish and Spanish-English bilingualism will be studied from critical sociolinguistic, historical and political perspectives.
Prerequisites: SPAN 350 with C- or better

SPAN 462. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
Recommended: SPAN 461

SPAN 470. *ADVANCED SPANISH COORDINATED STUDIES. (1-30 Credits)
Interdisciplinary examination of a topic related to points of contact between Spanish- and English-speaking populations in Oregon and beyond. Includes the study of literature, culture, language skills, and a service-learning component. Constitutes a full-time course load. Taught in Spanish. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
This course is repeatable for 30 credits.

SPAN 488. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises). Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.
This course is repeatable for 12 credits.

SPAN 499. SPECIAL TOPICS. (1-16 Credits)
May be repeated for credit when topic varies. Not offered every year. This course is repeatable for 99 credits.

SPAN 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 503. THESIS. (1-16 Credits)
This course is repeatable for 99 credits.

SPAN 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 506. SPECIAL PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

SPAN 510. INTERNSHIP. (1-15 Credits)
(See SPAN 410 for description.)
This course is repeatable for 15 credits.

SPAN 511. SPECIALIZED GRAMMAR OR LINGUISTICS TOPICS. (3 Credits)
Students develop an in-depth knowledge of various linguistic aspects of Spanish, particularly in regard to problematic grammatical structures and the development of writing proficiency. The main focus is on integrating a thorough understanding of grammatical structures into writing using selected literary works as models. Students analyze their own linguistic progress and apply this meta-knowledge to their writing.
Recommended: 18 credits of upper-division Spanish.

SPAN 512. ADVANCED COMPOSITION. (3 Credits)
Emphasis on creative writing. Students will read and discuss a series of stories with the same theme, then write their own. The subjunctive and other advanced grammar topics will be reviewed and incorporated into the writing activities. Taught in Spanish.
Recommended: 18 credits of upper-division Spanish

SPAN 513. ADVANCED COMMUNICATION SKILLS. (3 Credits)
Contextualized exploration of skills outlined in the National Standards Project's.
Recommended: 18 credits of upper-division Spanish

SPAN 535. SPECIAL TOPICS IN LATIN AMERICAN CULTURE. (3 Credits)
Historical and contemporary aspects of the cultures of Latin America. May include material relevant to Spain and U.S. Latinos. May be repeated for credit when topic varies.
This course is repeatable for 9 credits.
Recommended: 18 credits of upper-division Spanish

SPAN 536. SELECTED TOPICS IN LUSO-HISPANIC CULTURE. (3 Credits)
Contemporary aspects of the cultures of Spain, Portugal, or Latin America with a cross-cultural perspective. Topics and language of instruction vary. Not offered every year. May be repeated for credit when topic varies.
This course is repeatable for 12 credits.
Recommended: Completion of 6 credits from SPAN 331, SPAN 332, SPAN 333, SPAN 336, SPAN 337, SPAN 338.

SPAN 544. SELECTED TOPICS IN THE LITERATURE OF SPAIN. (3 Credits)
Representative Spanish prose, poetry, and drama, with an emphasis on the 19th and 20th centuries. Taught in Spanish. Not offered every year. May be repeated for credit when topic varies.
This course is repeatable for 12 credits.
Recommended: Completion of 21 upper-division credits in Spanish.

SPAN 545. SELECTED TOPICS IN THE LITERATURE OF LATIN AMERICA. (3 Credits)
Representative prose, poetry, and drama of Spanish America and/or Brazil, with an emphasis on the mid-19th century to the present. Topics and language of instruction may vary. Not offered every year. May be repeated for credit when topic varies.
This course is repeatable for 18 credits.
Recommended: Completion of 21 upper-division credits in Spanish.

SPAN 546. RECENT LATIN AMERICAN LITERATURE. (3 Credits)
Recent fiction that goes beyond Magical Realism. Discussion includes literary techniques, as well as Latin American history, politics and cultural values. Taught in Spanish.
Recommended: Completion of 21 upper-division credits in Spanish.

SPAN 547. MEXICAN WOMEN WRITERS. (3 Credits)
Fiction by contemporary Mexican women, emphasizing how the writing reflects the authors' lives, as well as Mexican history, politics and cultural values. Taught in Spanish.
Recommended: 21 upper-division credits of Spanish.

SPAN 548. LATIN AMERICAN GREAT WORKS. (3 Credits)
Major works by Latin American writers, concentrating on literary style and technique, as well as Latin American history, politics and culture. Taught in Spanish.
Recommended: 21 upper-division credits of Spanish.

SPAN 552. INTRODUCTION TO SPANISH SOCIOLINGUISTICS. (3 Credits)
Provides a foundation of sociolinguistic theory in order to analyze, discuss and apply the theory to Spanish language situations, such as language contact, Spanish varieties, language politics, and language attitudes; all within the context of a speech community and the external and internal variables that affect it.
SPAN 553. SPANISH SOCIOLINGUISTICS. (3 Credits)
Provides a foundation of sociolinguistic theory from which various topics can be analyzed, discussed and applied to language situations that are specific to Spanish. These include language contact, Spanish varieties, language policy, and language attitudes. All topics are presented within the context of speech communities and the external and internal variables that affect these communities.
Recommended: SPAN 350

SPAN 555. INTRODUCTION TO SPANISH TRANSLATION. (3 Credits)
Combines beginning translation theory with hands-on practice using a variety of activities from several areas of professional specialization. Includes a brief introduction to simultaneous interpretation as it is done in professional conference or broadcast media settings. Participants must be highly proficient in both English and Spanish.
Recommended: 12 credits of upper-division Spanish.

SPAN 556. SPANISH IN THE UNITED STATES. (3 Credits)
Provides a foundation for the study of Spanish in the United States. Focuses on the diverse identities of Latino/as and Spanish speakers as they define what it means to be bilingual locally, regionally, and nationally. Spanish and Spanish-English bilingualism will be studied from critical sociolinguistic, historical and political perspectives.
Recommended: SPAN 350

SPAN 561. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
Recommended: SPAN 413

SPAN 562. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
Recommended: SPAN 561

SPAN 563. FIFTH-YEAR SPANISH. (3 Credits)
Continued development of listening comprehension, speaking, and writing skills. Introduction to debate and platform speaking in Spanish, and to specialized interests of students, e.g., methods and philosophies of interpretation and translation, business Spanish, creative writing.
Recommended: SPAN 562

SPAN 569. TOPICS IN JOTERIA STUDIES. (3 Credits)
A space for engaging with arts, activism and scholarship emerging from queer Latin@/Chican@ experiences and consciousness is provided. Offered winter term in odd years. CROSSLISTED as ES 569/QS 569/SPAN 569/WGSS 569.
Equivalent to: ES 569, QS 569, WGSS 569
This course is repeatable for 6 credits.

SPAN 570. GRADUATE SPANISH COORDINATED STUDIES. (1-15 Credits)
An intensive, team-taught course in which learners engage in advanced exploration of issues of importance to Spanish-speaking communities in Oregon and facilitate the learning of undergraduate native speaker and second language students. Topics change regularly. The course addresses all communicative areas (reading, writing, speaking and listening) and includes content in the areas of literature, linguistics, culture, civic engagement, and service-learning. Successful completion of the full 15 credits with a grade of B or higher meets requirements for the graduate minor in Contemporary Hispanic Studies.
Equivalent to: SPAN 510, SPAN 538, SPAN 545, SPAN 546, SPAN 562, SPAN 563
This course is repeatable for 30 credits.
Recommended: SPAN 599

SPAN 588. HISPANIC STUDIES, HISPANIC STUDY CENTERS. (1-12 Credits)
Section 1: Topics, Hispanic language. Section 2: Practical work (exercises). Section 3: Topics, Hispanic arts and letters. Section 4: Topics, Hispanic society.

SPAN 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

SPAN 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Statistics (ST)

ST 199. SPECIAL TOPICS. (3 Credits)
This course can only be taken once unless instructor permission is provided.

ST 201. PRINCIPLES OF STATISTICS. (4 Credits)
Study design, descriptive statistics, the use of probability in statistical arguments, sampling, hypothesis tests and confidence intervals for means and proportions. Lec/rec.
Equivalent to: ST 201H
Recommended: High school algebra

ST 202. PRINCIPLES OF STATISTICS. (4 Credits)
Comparisons of means and proportions between two populations (t-tests, chi-square tests, nonparametric tests), simple linear regression, correlation. Lec/rec.
Prerequisites: ST 201 with D- or better
Equivalent to: ST 209

ST 314. INTRODUCTION TO STATISTICS FOR ENGINEERS. (3 Credits)
Probability, common probability distributions, sampling distributions, estimation, hypothesis testing, control charts, regression analysis, experimental design.
Prerequisites: MTH 252 with D- or better or MTH 252H with D- or better
Equivalent to: ST 314H

ST 351. INTRODUCTION TO STATISTICAL METHODS. (4 Credits)
Study designs, descriptive statistics, collecting and recording data, probability distributions, sampling distributions for means and proportions, hypothesis testing and confidence intervals for means and proportions in one- and two-sample inference, and chi-square tests. Lec/lab.
Equivalent to: ST 351H
Recommended: High school algebra with statistics
ST 351H. INTRODUCTION TO STATISTICAL METHODS. (4 Credits)
Study designs, descriptive statistics, collecting and recording data, probability distributions, sampling distributions for means and proportions, hypothesis testing and confidence intervals for means and proportions in one- and two-sample inference, and chi-square tests. Lec/lab.

Attributes:  HNRS – Honors Course Designator
Equivalent to: ST 351
Recommended: High school algebra with statistics

Prerequisites: ST 351 with D- or better or ST 351H with D- or better

ST 352. INTRODUCTION TO STATISTICAL METHODS. (4 Credits)
Randomization tests and other nonparametric tests for one- and two-sample inference, simple and multiple linear regression, correlation, one- and two-way analysis of variance, logistic regression. Lec/lab.

Prerequisites: ST 351 with D- or better or ST 351H with D- or better

ST 406. PROJECTS. (1-16 Credits)
Section 1: Projects, graded P/N. Section 2: Teaching Experience, graded P/N. Section 3: Directed Work, graded P/N.
This course is repeatable for 16 credits.

ST 407. SEMINAR. (1 Credit)
Attendance at consulting practicum. Graded P/N.

ST 410. INTERNSHIP. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

ST 411. METHODS OF DATA ANALYSIS. (4 Credits)
Graphical, parametric and nonparametric methods for comparing two samples; one-way and two-way analysis of variance; simple linear regression. Lec/lab.

Recommended: ST 351

ST 412. METHODS OF DATA ANALYSIS. (4 Credits)
Multiple linear regression, including model checking, dummy variables, using regression to fit analysis of variance models, analysis of covariance, variable selection methods. Lec/lab.

Recommended: ST 351

Prerequisites: ST 411 with D- or better

ST 413. METHODS OF DATA ANALYSIS. (4 Credits)
Principles of experimental design; randomized block and factorial designs; repeated measures; categorical data analysis, including comparison of proportions, tests of homogeneity and independence in cross-classified frequency tables, Mantel-Haenszel test, logistic regression, log-linear regression. Introduction to multivariate statistics. Lec/lab.

Prerequisites: ST 412 with D- or better
Recommended: ST 351

ST 415. DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS. (3 Credits)
Principles of experimental design; uses, construction and analysis of completely randomized, randomized block and Latin square designs; covariates; factorial treatments, split-plotting; random effects and variance components.

Prerequisites: ST 352 with D- or better or ST 411 with D- or better or ST 511 with D- or better

ST 421. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Probability, random variables, expectation, discrete and continuous distributions, multivariate distributions.

Recommended: MTH 253

ST 422. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Sampling distributions, Central Limit Theorem, estimation, confidence intervals, properties of estimators, and hypothesis testing.

Prerequisites: ST 421 with D- or better
Recommended: MTH 253

ST 431. SAMPLING METHODS. (3 Credits)
Estimation of means, totals and proportions; sampling designs including simple random, stratified, cluster, systematic, multistage and double sampling; ratio and regression estimators; sources of errors in surveys; capture-recapture methods.

Recommended: ST 411 or ST 511

ST 435. QUANTITATIVE ECOLOGY. (3 Credits)
Overview of statistical methods that are useful for analyzing ecological data, including spatial pattern analysis, multivariate techniques, logistic regression, Bayesian statistics and computer-intensive methods. Consideration of special topics such as population dynamics, food webs and ecological indicators. Not offered every year.

Prerequisites: ST 412 with D- or better or ST 512 with D- or better

ST 439. SURVEY METHODS. (3 Credits)
Survey design, data collection and analysis, general methodology.

Prerequisites: ST 201 with D- or better or ST 351 with D- or better

ST 441. PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS. (4 Credits)

Prerequisites: ST 422 with D- or better or ST 522 with D- or better

ST 443. APPLIED STOCHASTIC MODELS. (3 Credits)
Development of stochastic models commonly arising in statistics and operations research, such as Poisson processes, birth-and-death processes, discrete-time and continuous-time Markov chains, renewal and Markov renewal processes. Analysis of stochastic models by simulation and other computational techniques.

Prerequisites: ST 421 with D- or better or ST 521 with D- or better
Recommended: Experience with a high-level programming language or mathematical computation package

ST 499. SPECIAL TOPICS. (1-4 Credits)
May be repeated for credit.
This course is repeatable for 8 credits.

ST 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ST 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ST 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

ST 506. PROJECTS. (1-16 Credits)
Section 1: Projects. Section 2: Teaching Experience. Section 3: Directed Work.
This course is repeatable for 16 credits.

ST 507. SEMINAR. (1 Credit)
Section 1: Attendance at consulting practicum, 1 credit. Section 3: Research Seminar, 1 credit. Section 4: Computing Facilities, 1 credit. All sections graded P/N.
This course is repeatable for 99 credits.
ST 509. CONSULTING PRACTICUM. (2 Credits)
The student provides statistical advice, under faculty guidance, on university-related research projects. 
This course is repeatable for 99 credits.
Recommended: ST 507 and ST 553

ST 510. INTERNSHIP. (1-16 Credits)
Graded P/N. 
This course is repeatable for 16 credits.

ST 511. METHODS OF DATA ANALYSIS. (4 Credits)
Graphical, parametric and nonparametric methods for comparing two samples; one-way and two-way analysis of variance; simple linear regression. Lec/lab.
Recommended: ST 351

ST 512. METHODS OF DATA ANALYSIS. (4 Credits)
Multiple linear regression, including model checking, dummy variables, using regression to fit analysis of variance models, analysis of covariance, variable selection methods. Lec/lab.
Prerequisites: ST 511 with C or better
Recommended: ST 351

ST 513. METHODS OF DATA ANALYSIS. (4 Credits)
Principles of experimental design; randomized block and factorial designs; repeated measures; categorical data analysis, including comparison of proportions, tests of homogeneity and independence in cross-classified frequency tables, Mantel-Haenszel test, logistic regression, log-linear regression. Introduction to multivariate statistics. Lec/lab.
Prerequisites: ST 512 with C or better
Recommended: ST 351

ST 515. DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS. (3 Credits)
Principles of experimental design; uses, construction and analysis of completely randomized, randomized block and Latin square designs; covariates; factorial treatments, split plotting; random effects and variance components.
Recommended: ST 352 or (ST 411 or ST 511)

ST 516. FOUNDATIONS OF DATA ANALYTICS. (4 Credits)
Foundations of estimation and hypothesis testing; desirable properties of estimators; maximum likelihood; one- and two-sample problems; theoretical results are explored through simulations and analysis using R. Offered via Ecampus only.
Recommended: ST 351

ST 517. DATA ANALYTICS I. (4 Credits)
Methods for modeling quantitative data and statistical learning—simple and multiple linear regression; linear mixed effects models; data imputation; prediction and cross-validation; scaling up to large datasets. Simulations and data analysis using R. Offered via Ecampus only.
Prerequisites: ST 516 with C+ or better

ST 518. DATA ANALYTICS II. (4 Credits)
Statistical methods and data analysis techniques for count data. Topics include tests for tables of counts, logistic regression, log-linear regression, generalized linear mixed models, and issues for large datasets. Data analysis in R.
Prerequisites: ST 517 with C+ or better

ST 521. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Probability, random variables, expectation, discrete and continuous distributions, multivariate distributions.
Recommended: MTH 253

ST 522. INTRODUCTION TO MATHEMATICAL STATISTICS. (4 Credits)
Sampling distributions, Central Limit Theorem, estimation, confidence intervals, properties of estimators, and hypothesis testing.
Prerequisites: ST 521 with C or better
Recommended: MTH 253

ST 525. APPLIED SURVIVAL ANALYSIS. (3 Credits)
Statistical methods for analyzing survival data or time-to-event data, which may be censored and/or truncated. Specific topics can vary term to term, and could include Kaplan-Meier estimator; K-sample hypothesis tests for survival data; Accelerated failure time model; Cox proportional hazard regression model.
Prerequisites: ST 516 with C or better and ST 517 [C] and ST 518 [C]

ST 531. SAMPLING METHODS. (3 Credits)
Estimation of means, totals and proportions; sampling designs including simple random, stratified, cluster, systematic, multistage and double sampling; ratio and regression estimators; sources of errors in surveys; capture-recapture methods.
Recommended: ST 411 or ST 511

ST 535. QUANTITATIVE ECOLOGY. (3 Credits)
Overview of statistical methods that are useful for analyzing ecological data, including spatial pattern analysis, multivariate techniques, logistic regression, Bayesian statistics and computer-intensive methods. Consideration of special topics such as population dynamics, food webs and ecological indicators. Not offered every year.
Recommended: ST 412 or ST 512

ST 537. DATA VISUALIZATION. (3 Credits)
Perceptual principles for displaying data; critique and improvement of data visualizations; use of color in visualization; principles of tidy data; strategies for data exploration; select special topics.
Prerequisites: ST 512 with C or better or ST 517 with C or better or ST 552 with C or better
Recommended: Familiarity with linear regression and using R

ST 538. MODERN STATISTICAL METHODS FOR LARGE AND COMPLEX DATA SETS. (3 Credits)
Provides students with the tools and experience to analyze big and messy data and work effectively in a data science team. Covers the tools to handle big data and answer statistical questions based on the data. Includes three big data analysis projects that students work on in groups. Focuses on proper use of modern data analysis techniques related to regression, classification and clustering for data coming from a variety of application fields. R will be the lingua franca.
Prerequisites: ST 512 with C or better or ST 517 with C or better or ST 552 with C or better or ST 412 with C or better

ST 539. SURVEY METHODS. (3 Credits)
Survey design, data collection and analysis, general methodology.
Recommended: ST 201 or ST 351

ST 541. PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS. (4 Credits)
Recommended: ST 422 or ST 522
Recommended: (ST 421 or ST 521) and experience with a high-level programming language or mathematical computation package.

**ST 551. STATISTICAL METHODS. (4 Credits)**
Properties of t, chi-square, and F tests; randomized experiments; sampling distributions and standard errors of estimators, delta method, comparison of several groups of measurements; two-way tables of measurements.

Recommended: Concurrent enrollment in MTH 341 and (ST 422 or ST 522)

**ST 552. STATISTICAL METHODS. (4 Credits)**
Simple and multiple linear regression including polynomial regression, indicator variables, weighted regression, and influence statistics, nonlinear regression and linear models for binary data.

Prerequisites: ST 551 with C or better
Recommended: ST 422 or ST 522.

**ST 553. STATISTICAL METHODS. (4 Credits)**
Principles and analysis of designed experiments, including factorial experiments, analysis of covariance, random and mixed effect models.

Lec/lab.
Prerequisites: ST 552 with C or better

**ST 554. ADVANCED EXPERIMENTAL DESIGN. (3 Credits)**
Designs leading to mixed models including split plots, repeated measures, crossovers and incomplete blocks. Introduction to experimental design in industry including confounding, fractional factorials and response surface methodology. Analysis of unbalanced data.

Prerequisites: ST 553 with C or better

**ST 555. APPLIED MULTIVARIATE ANALYSIS. (3 Credits)**
Multivariate data structures, linear combinations; principal components, factor and latent structure analysis, canonical correlations, discriminant analysis; cluster analysis, multidimensional scaling. Not offered every year.

Recommended: (ST 412 or ST 512) and (MTH 252 or MTH 245)

**ST 556. TIME SERIES ANALYTICS. (3 Credits)**
Analysis of serially correlated data in both time and frequency domains. Autocorrelation and partial autocorrelation functions, autoregressive integrated moving average models, model building, forecasting; filtering, smoothing, spectral analysis, frequency response studies. Offered winter term in even years.

Recommended: (ST 412 or ST 512) and (ST 422 or ST 522)

**ST 557. SPATIAL STATISTICS. (3 Credits)**
The analysis of spatial data. Graphical tools for exploring spatial data, geostatistics, variogram estimation, kriging, areal models, hierarchical spatial models, and spatio-temporal modeling. Offered winter term in odd years.

Recommended: (ST 412 or ST 512) and (ST 422 or ST 522)

**ST 558. MULTIVARIATE ANALYSIS. (3 Credits)**
Basics of matrix algebra, principal components analysis, cluster analysis, factor analysis, multidimensional scaling.

Prerequisites: ST 518 with C- or better

**ST 559. BAYESIAN STATISTICS. (3 Credits)**
Bayesian statistics for data analysis. Characterizations of probability; comparative (Bayesian versus frequentist) inference; prior, posterior and predictive distributions; hierarchical modeling. Computational methods include Markov Chain Monte Carlo for posterior simulation.

Recommended: ST 562

**ST 560. THEORY OF STATISTICS. (4 Credits)**
Distributions of functions of random variables, joint and conditional distributions, sampling distributions, convergence concepts, order statistics. Lec/rec.

Recommended: ST 422 or ST 522

**ST 561. THEORY OF STATISTICS. (4 Credits)**
Sufficiency, exponential families, location and scale families; point estimation: maximum likelihood, Bayes, and unbiased estimators; asymptotic distributions of maximum likelihood estimators; Taylor series approximations.

Prerequisites: ST 561 with C or better
Recommended: ST 422 or ST 522

**ST 562. THEORY OF STATISTICS. (4 Credits)**
Hypothesis testing: likelihood ratio, Bayesian, and uniformly most powerful tests; similar tests in exponential families; asymptotic distributions of likelihood ratio test statistics; confidence intervals.

Prerequisites: ST 562 with C or better
This course is repeatable for 4 credits.

Recommended: ST 422 or ST 522

**ST 563. THEORY OF STATISTICS. (4 Credits)**
Analysis of serially correlated data in both time and frequency domains. Autocorrelation and partial autocorrelation functions, autoregressive integrated moving average models, model building, forecasting; filtering, smoothing, spectral analysis, frequency response studies. Offered winter term in even years.

Recommended: (ST 412 or ST 512) and (ST 422 or ST 522)

**ST 564. TIME SERIES ANALYTICS. (3 Credits)**
Focuses on statistical and analytical tools for analyzing data that are observed sequentially over time. Specific topics can vary term to term, and could include methods for exploratory time series analysis, linear time series models (ARMA, ARIMA), forecasting, spectral analysis and state-space models. The focus will be on applied problems, though some mathematical statistics is necessary for a solid understanding of the statistical issues. This course is designed for students in Data Analytics MS and Certificate programs.

Prerequisites: ST 516 with C or better and ST 517 [C] and ST 518 [C]

**ST 565. SPATIAL STATISTICS. (3 Credits)**
The analysis of spatial data. Graphical tools for exploring spatial data, geostatistics, variogram estimation, kriging, areal models, hierarchical spatial models, and spatio-temporal modelling. Offered winter term in odd years.

Recommended: (ST 412 or ST 512) and (ST 422 or ST 522)

**ST 566. THEORY OF STATISTICS. (4 Credits)**
Provides an overview of how genomic data is generated and analyzed. It focuses on the underlying biological motivation, theoretical concepts, and analytical challenges associated with genomic research, especially the generation of statistics that summarize genomic data. The class is organized as a combination of lectures and group literature review discussions. Students are expected to actively participate in the class. Students from diverse backgrounds, including quantitative, biological, and computations sciences, are encouraged to enroll.

Recommended: ST 411 or ST 511

**ST 567. STATISTICAL METHODS FOR GENOMICS RESEARCH. (3 Credits)**
Lectures include an overview of statistical methods commonly applied in genomics research. Specific methods can vary term to term, and could include cluster analysis, decision trees, dimension reduction tools, regression models, multiple testing adjustment, variable selection methods, etc. Journal clubs include team-based review and presentations of landmark papers in both statistical methodology and genomics research. Research experience includes whole-term collaboration between students from statistics and other disciplines on real projects.

Recommended: ST 411 or ST 511 or a higher level course such as ST 551
ST 595. CAPSTONE PROJECT. (3 Credits)
Provides an opportunity for students to integrate and apply the analytics skills learned in MS in Data Analytics program to solve real-world problems and to interpret and communicate their results. Student teams will engage in the entire process of solving data science projects in realistic settings, from placing the problem into appropriate statistical framework to applying suitable analytic methods to the problem. Problem solving, written and oral communication skills will be emphasized.
Prerequisites: ST 516 with C or better and ST 517 [C] and ST 518 [C] and ST 558 [C]

ST 599. SPECIAL TOPICS. (1-4 Credits)
May be repeated for credit when topic varies. This course is repeatable for 16 credits.

ST 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

ST 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

ST 606. PROJECTS. (1-16 Credits)
Section 1: Projects; Section 2: Teaching Experience, graded P/N; Section 3: Directed Work, graded P/N.
This course is repeatable for 16 credits.

ST 623. GENERALIZED REGRESSION MODELS. (3 Credits)
Maximum likelihood analysis for frequency data; regression-type models for binomial and Poisson data; iterative weighted least squares and maximum likelihood; analysis of deviance and residuals; over-dispersion and quasi-likelihood models; log-linear models for multidimensional contingency tables.
Prerequisites: ST 553 with C or better and ST 563 [C]

ST 625. SURVIVAL ANALYSIS. (3 Credits)
Prepares students to understand and analyze survival data. Concepts to be discussed include: hazard function (failure rate function); nonparametric likelihood; empirical processes; empirical distribution function; censoring (mostly right independent censoring); Kaplan-Meier estimator; Bias of the KM estimator; Cox proportional hazards model; Accelerated Failure Time Model; Partial Likelihood; log-rank test.
Prerequisites: ST 553 with C or better or ST 563 with C or better

ST 651. LINEAR MODEL THEORY. (3 Credits)
Least squares estimation, best linear unbiased estimation, parameterizations, multivariate normal distributions, distributions of quadratic forms, testing linear hypotheses, simultaneous confidence intervals. Offered alternate years.
Recommended: ST 553 and ST 563

ST 652. LINEAR MODEL THEORY. (3 Credits)
Advanced topics including classification models, mixed-effects models and multivariate models. Offered alternate years.
Prerequisites: ST 651 with C or better
Recommended: ST 553 and ST 563

ST 661. ADVANCED THEORY OF STATISTICS. (3 Credits)
Exponential families, sufficient statistics; unbiased, equivariant, Bayes, and admissible estimation. Offered alternate years.
Recommended: ST 563 and MTH 511

ST 662. ADVANCED THEORY OF STATISTICS. (3 Credits)
Uniformly most powerful, unbiased, similar, and invariant tests. Offered alternate years.
Prerequisites: ST 661 with C or better
Recommended: ST 563 and MTH 511

ST 663. ADVANCED THEORY OF STATISTICS. (3 Credits)
First-order and higher-order asymptotics; likelihood ratio, score, and Wald tests; Edgeworth and saddlepoint approximations. Offered alternate years.
Prerequisites: ST 662 with C or better
Recommended: ST 563 and MTH 511

Sustainability (SUS)

SUS 102. *INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY. (4 Credits)
An introduction to the science behind critical environmental issues and the biological basis of creating and maintaining sustainable ecosystems. Focus on such questions as: how do we decide what to believe about environmental issues? Do we quantify, restore, and value biodiversity? What is valid science in the global warming debate? Lec/lab. (Bacc Core Course)
Attributes: CPBS – Core, Pers, Biological Science
Equivalent to: SOIL 102

SUS 103. *INTRODUCTION TO CLIMATE CHANGE. (4 Credits)
An introduction to the principles of climate change science with an emphasis on the empirical evidence for climate change. Students will learn critical thinking skills to assess such questions as: How do we determine the processes controlling global warming? How do we predict trends in climate change? How do we calculate and understand uncertainty in these predictions? What is valid science in the global warming debate? Lec/lab. (Bacc Core Course)
Attributes: CPSS – Core, Pers, Physical Science

SUS 304. *SUSTAINABILITY ASSESSMENT. (4 Credits)
Explores theories and application of sustainability assessment techniques and analysis methods. Practical application of globally recognized assessment protocol, including checklists, footprinting, life-cycle analysis and the indicators used to conduct these analyses. Emphasis on ecological and social indicators, although economic indicators are explored. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

SUS 325. *AG AND ENVIRONMENTAL PREDICAMENTS: A CASE STUDY APPROACH. (3 Credits)
Analyze controversial agricultural and environmental issues, synthesize information from diverse sources, and apply scientific knowledge to recommend specific courses of action to solve real world problems. Develop oral and written communication skills through individual and group work. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: SOIL 325

SUS 331. *SUSTAINABILITY, JUSTICE, AND ENGAGEMENT. (3 Credits)
Many sustainability crises are local, and the people most impacted tend to be groups already experiencing difference, lack of power, and discrimination. Transformational responses led by those most affected will be examined – responses that address the environmental problem while also building social and economic power for those affected. The tools and tactics used to achieve positive changes will be analyzed. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
SUS 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

SUS 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

SUS 420. SOCIAL DIMENSIONS OF SUSTAINABILITY. (3 Credits)
Focuses on the social aspects of sustainability, including how the
environment, the economy, social life interact to create the world we
live in. Explores how social institutions (school, government, business,
family) contribute to sustainability and promote or discourage social and
environmental justice at local and global scales. Also offered at OSU-
Cascades and via Ecampus.

SUS 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

SUS 512. TOPICS IN THE SCIENCE OF SUSTAINABILITY. (4 Credits)
Provides a graduate-level introduction to key concepts and issues in
environmental science and sustainability, targeted at business-oriented
graduate and post-bacc students who do not have a science background.
The course is a core requirement of the Sustainable Business certificate
program offered jointly by the College of Business (COB) and the College
of Agricultural Sciences’ (CAS) Sustainability Double-Degree (SDD)
Program.

SUS 514. SUSTAINABILITY PLANNING AND ASSESSMENT. (4 Credits)
Sustainability is fundamentally about balancing social, economic
and ecological systems. This course examines a range of different
methodologies for measuring and evaluating performance towards
established sustainability criteria and indicators. Students will critically
evaluate tools for making sustainable decisions and understand
the limitations of individual assessment approaches in different
contexts. Specific assessment techniques to be explored include
ecological footprinting, sustainable community indicators, greenhouse
gas emissions inventories, sustainability checklists, environmental
management systems (ISO standards), life-cycle analysis, and business
sustainability reporting. Students will leave the course with the
fundamental skills required to complete sustainability assessments via
globally relevant approaches.

SUS 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

Sustainable Natural Resources (SNR)

SNR 506. INDEPENDENT PROJECT IN NATURAL RESOURCE
SUSTAINABILITY. (2 Credits)
Students identify, pose, frame, and analyze the various components of
an important natural resource sustainability problem within their country,
region, or organization and, at the end of term, present a workplan for its
resolution. Oral and written reports are expected. Graded P/N.
Prerequisites: SNR 511 with C or better

SNR 511. SUSTAINABLE NATURAL RESOURCE DEVELOPMENT. (1 Credit)
Using readings, class discussions, and field trips, we introduce the
program sessions and pedagogical methods, familiarize students with
basic working definitions of sustainability, and build capacity to work as
group on a common project.

SNR 520. SOCIAL ASPECTS OF SUSTAINABLE NATURAL RESOURCES. (3 Credits)
Using readings, personal experiences, and class discussions, students
explore five principles of socially sustainable natural resource
management, and review the role they play in creating natural resource-
based sustainable communities.
Recommended: SNR 511 and at least two years’ experience working in a
natural resources-related field

SNR 521. ECONOMICS OF SUSTAINABLE NATURAL RESOURCE
MANAGEMENT. (3 Credits)
Focuses on the sources of market failure, the means of correcting
market failure, and the real-world examples of making progress toward
sustainable resource use by means of market mechanisms.
Recommended: SNR 511 and at least two years’ experience working in a
natural resources-related field

SNR 522. BASIC BELIEFS AND ETHICS IN NATURAL RESOURCES. (3 Credits)
Examines basic philosophies and ethical systems in American forestry,
including Pinchot’s agricultural/utilitarian approach and Leopold’s biotic/
ecological model, compares them to contemporary public attitudes and
considers their implications for sustainability.

SNR 530. ECOLOGICAL PRINCIPLES OF SUSTAINABLE NATURAL
RESOURCES. (3 Credits)
Focus an ecological sustainability and ecological concepts and
principles, with examples drawn from forests and arid lands. Exploration
of global ecosystems, ecological processes and services, factors that
create and maintain diversity, ecosystem health and integrity. Principles
for sustainable natural resource management and use.
Recommended: SNR 511 and at least two years’ experience working in a
natural resources-related field. Basic ecology course highly
recommended.

SNR 531. SUSTAINABLE SILVICULTURE AND FOREST CERTIFICATION. (3 Credits)
Strategies for sustainable silviculture, and measuring and verifying
environmental performance (including certification systems) are
examined using classroom lectures, case studies, and field exercises.
Part of the 18-credit Sustainable Natural Resources (SNR) Graduate
Certificate; also open to other graduate students.
Recommended: SNR 511 and at least two years’ experience working in a
natural resources-related field

SNR 532. PLANNING AGROFORESTRY PROJECTS. (2 Credits)
Develop basic understanding and appreciation of agroforestry concepts,
systems, technologies and practices as used and applied in tropical and
temperate zones of the world.
Recommended: SNR 530 (or equivalent ecology course) and SNR 511

SNR 533. NONTIMBER FOREST PRODUCTS: AN INTERDISCIPLINARY
INTRODUCTION. (3 Credits)
Interdisciplinary introduction to the culture, history, economy, ecology,
policy and management of nontimber forest products (NTFP), e.g., wild
foods, medicines, floral greens, craft material and landscaping species.
Includes domestic public and private forest and international case
studies.
SNR 534. REDUCED IMPACT TIMBER HARVEST. (2 Credits)
Explores planning, implementation, monitoring, and evaluation of reduced impact timber harvesting. Part of the 18-credit Sustainable Natural Resources (SNR) Graduate Certificate; also open to other graduate students.
Recommended: SNR 511 and at least two years' experience working in a natural resources-related field

SNR 535. SUSTAINABLE MANAGEMENT OF AQUATIC AND RIPARIAN RESOURCES. (3 Credits)
Explores integrated strategies for sustainable management of watersheds, estuaries, coastal zones, and aquatic resources. Special emphasis given to links between land uses and aquatic environments. Part of the 18-credit Sustainable Natural Resources (SNR) Graduate Certificate; also open to other graduate students.
Recommended: SNR 511 and at least two years' experience working in a natural resources-related field

SNR 540. GLOBAL ENVIRONMENTAL CHANGE. (3 Credits)
Explore biophysical and social sciences that underlie contemporary global change issues: global biogeochemical cycles, climate system, climate change, threats to biodiversity; human dimensions of climate change, globalization, land cover and land use change, global environmental governance and management tools.
Recommended: At least two years' working in a natural resources-related field. Basic biology course highly recommended

SNR 808. WORKSHOP. (1-4 Credits)
Describes the policies, practices, and market mechanisms that enhance ecological, economic, and social sustainability of natural resource production and natural ecosystems. Sustainable natural resource management attempts to meet the needs of the present without compromising the future of people or the ecosystems on which they depend. 
This course is repeatable for 4 credits.

Theatre Arts (TA)

TA 121. ORAL INTERPRETATION I. (3 Credits)
Analysis and presentation of literature. Exploration of emotional reactions, expressive vocal and physical responses, and performing techniques for effective communication. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core

TA 144. PLAYREADING. (1 Credit)
Reading/discussion/examination of plays from world theatre of past and present from the perspective of production and theatre history.
This course is repeatable for 2 credits.

TA 147. *INTRODUCTION TO THE THEATRE. (3 Credits)
Origins, history, nature, elements, and style of theatre production; function of artists and craftspersons of the theatre. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACF – Liberal Arts Fine Arts Core
Equivalent to: TA 147H

TA 147H. *INTRODUCTION TO THE THEATRE. (3 Credits)
Origins, history, nature, elements, and style of theatre production; function of artists and craftspersons of the theatre. (FA) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator; LACF – Liberal Arts Fine Arts Core
Equivalent to: TA 147

TA 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 242. VISUAL PRINCIPLES OF THEATRE. (3 Credits)
An introduction to visual creativity, creative thinking, and visual problem solving as applied to theatre arts as a whole, and to scene and costume design. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core

TA 243. PRINCIPLES OF COSTUMING FOR THE STAGE. (3 Credits)
Principles and techniques of costume construction; practical application in the costume shop on theatre production.
Recommended: TA 147 and TA 242

TA 244. SCENE CRAFTS. (3 Credits)
Constructing scenery and stage properties; practical experience in backstage procedures and scene painting. Lec/lab. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core

TA 245. STAGE LIGHTING. (3 Credits)
Fundamentals of electricity as used in stage lighting; color and light, lighting instruments and control systems, theory and practice of lighting stage production.
Recommended: TA 244

TA 247. STAGE MAKEUP. (3 Credits)
Basic principles and theory with laboratory experience in most-used applications of theatrical makeup.

TA 248. FUNDAMENTALS OF ACTING I. (3 Credits)
Examination of basic principles and techniques of acting. Exploration of relaxation/focus, personal vocal/physical awareness, the actor's craft, and the performance process. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Recommended: TA 147

TA 249. FUNDAMENTALS OF ACTING II. (3 Credits)
Continued work in the basic principles and techniques of acting. Emphasis on improvisation, character analysis, and creation, the balance between truth and technique.
Prerequisites: TA 248 with D- or better

TA 250. WORKSHOP: THEATRE ARTS. (1-3 Credits)
Practical experience in performance, technical theatre, or design. Maximum for 6 credits may be applied toward graduation.
Equivalent to: TA 250H
This course is repeatable for 6 credits.

TA 250H. WORKSHOP: THEATRE ARTS. (1-3 Credits)
Practical experience in performance, technical theatre, or design. Maximum for 6 credits may be applied toward graduation.
Attributes: HNRS – Honors Course Designator
Equivalent to: TA 250
This course is repeatable for 6 credits.

TA 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 330. *HISTORY OF THE THEATRE. (3 Credits)
The rise and development of the composite arts of the theatre in their cultural and social context. Origins to 1500. Offered alternate years. (H) (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts Humanities Core
TA 331. *HISTORY OF THE THEATRE. (3 Credits)
The rise and development of the composite arts of the theatre in their
cultural and social context. 1500 to 1870. Offered alternate years. (H)
(Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; LACH – Liberal Arts
Humanities Core
Recommended: TA 144 and TA 147

TA 332. **HISTORY OF THE THEATRE. (3 Credits)
The rise and development of the composite arts of the theatre in their
cultural and social context. 1870 to present. Offered alternate years. (H)
(Bacc Core Course) (Writing Intensive Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CWIC – Core, Skills, WIC;
LACH – Liberal Arts Humanities Core
Recommended: TA 144 and TA 147

TA 344. PLAYSCRIPT ANALYSIS. (3 Credits)
Study of major approaches to playscript analysis and detailed application
of these systems to the theatrical production process. (H)
Attributes: LACH – Liberal Arts Humanities Core
Prerequisites: TA 147 with D- or better
Recommended: TA 144

TA 346. SCENE AND STAGE DESIGN. (3 Credits)
Designs for stage productions including elements of color, mass, line,
and lighting for various types of theatre architecture and plays. Offered
alternate years.
Recommended: TA 147 and TA 244

TA 348. ADVANCED ACTING: REALISM. (3 Credits)
Discussion, research, rehearsal, performance, and criticism of scenes
from realistic drama. Emphasis on the craft of acting, emotional
availability/honesty, personal awareness. Offered alternate years.
Prerequisites: TA 248 with D- or better

TA 349. ADVANCED ACTING: STYLES. (3 Credits)
Discussion, research, rehearsal, performance, and criticism of scenes
from a range of period and genre styles. Offered alternate years.
Prerequisites: TA 248 with D- or better

TA 350. WORKSHOP THEATRE ARTS. (1-3 Credits)
Advanced work in acting, directing or technical theatre in dramatic
productions; laboratory experience. Maximum of 6 credits may be applied
toward graduation.
This course is repeatable for 6 credits.

TA 351. PRINCIPLES OF PLAYWRITING. (3 Credits)
Basic principles and techniques of playwriting. Offered alternate years.
Recommended: TA 144 and TA 344

TA 352. PLAYWRITING WORKSHOP. (3 Credits)
Intensive work on student playscripts generated in TA 351, through re-
writes, revision and rehearsals. Offered alternate years.
Recommended: TA 351

TA 354. FUNDS PLAY DIRECTION. (3 Credits)
History, theories and techniques of stage direction. Script analysis,
study of the audience, staging, working with actors and designers, the
production process. Emphasis on practical exploration and application.
Offered alternate years.
Recommended: TA 244 and TA 248

TA 360. *MULTICULTURAL AMERICAN THEATRE. (3 Credits)
Examines the rich panorama of multicultural-American theatre (e.g.,
African-American, gay and lesbian, Hispanic, Asian American). (H) (Bacc
Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: TA 360H

TA 360H. *MULTICULTURAL AMERICAN THEATRE. (3 Credits)
Examines the rich panorama of multicultural-American theatre (e.g.,
African-American, gay and lesbian, Hispanic, Asian American). (H) (Bacc
Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination;
HNRS – Honors Course Designator; LACH – Liberal Arts Humanities Core
Equivalent to: TA 360

TA 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 401. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

TA 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

TA 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

TA 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

TA 407H. SEMINAR. (1-16 Credits)
Equivalent to: TA 407H
This course is repeatable for 16 credits.

TA 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

TA 410. THEATRE ARTS INTERNSHIP. (1-16 Credits)
One- to three-term residency in a producing theatre, for a maximum
allowable total of 15 credits. Student works in a department of the theatre
and in related production activities, according to areas of interest or
specialization. Work supervised and evaluated by agency staff; academic
evaluation by supervising department faculty member(s). Available to
upper-division theatre arts majors and graduate students approved by
faculty and selected by intern agency.
This course is repeatable for 15 credits.
Recommended: 27 credits of theatre arts, with a minimum of 6 credits
in area of skill specialization, or 12 credits of upper-division theatre arts
courses, with a minimum of 6 credits in area of skill specialization

TA 416. TOPICS IN THEATRE ARTS. (3 Credits)
Lectures and explorations of theories, issues, methods, problems, and
applications in theatre arts. Concentrated work in a variety of selected
theatre topics. Offered as demand and staffing allow.
Equivalent to: TA 416H
This course is repeatable for 12 credits.
Recommended: 9 credits of theatre arts
TA 416H. TOPICS IN THEATRE ARTS. (3 Credits)
Lectures and explorations of theories, issues, methods, problems, and applications in theatre arts. Concentrated work in a variety of selected theatre topics. Offered as demand and staffing allow.
Attributes: HNRS – Honors Course Designator
Equivalent to: TA 416
This course is repeatable for 12 credits.
Recommended: 9 credits of theatre arts

TA 443. COSTUME DESIGN. (3 Credits)
Theory and practice of designing costumes for a theatrical production.
Recommended: TA 243

TA 444. *THEORY AND CRITICISM OF THEATRE ARTS. (3 Credits)
Major theories that have influenced and motivated theatre practice in Western civilization throughout its development. Offered on alternate years. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: TA 444H
Recommended: 6 credits of theatre history, or 6 credits of dramatic literature.

TA 450. STUDIO: THEATRE ARTS. (3-6 Credits)
Advanced individual study on approved projects in one of the arts of the theatre: acting, directing or scene/costume/lighting design; or in stage or theatre management.
This course is repeatable for 6 credits.
Recommended: 9 credits of upper-division theatre arts

TA 451. INTRODUCTION TO ARTS ENTREPRENEURSHIP. (3 Credits)
Survey of the business strategies behind a successful career in the arts. Emphasizes the importance of entrepreneurial thinking, engages students with the fundamentals of the arts 'business', and explores ways to influence and shape the industry's future. CROSSLISTED as ART 451/ MUS 451/TA 451. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Equivalent to: ART 451, MUS 451

TA 454. ADVANCED PLAY DIRECTION. (3 Credits)
Expanded exploration of directing theories and techniques. Practical application through the production of a one-act play in a laboratory theatre. Offered alternate years.
Prerequisites: TA 354 with D- or better

TA 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

TA 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

TA 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

TA 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

TA 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

TA 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

TA 510. THEATRE ARTS INTERNSHIP. (6-15 Credits)
One- to three-term residency in a producing theatre, for a maximum allowable total of 15 credits. Student works in a department of the theatre and in related production activities, according to areas of interest or specialization. Work supervised and evaluated by agency staff; academic evaluation by supervising department faculty member(s). Available to upper-division theatre arts majors and graduate students approved by faculty and selected by intern agency.
This course is repeatable for 15 credits.
Recommended: 27 credits in theatre arts, with a minimum of 6 credits in area of skill specialization, or 12 credits of upper-division theatre arts courses, with a minimum of 6 credits in area of skill specialization

TA 516. TOPICS IN THEATRE ARTS. (3 Credits)
Lectures and explorations of theories, issues, methods, problems, and applications in theatre arts. Concentrated work in a variety of selected theatre topics. Offered as demand and staffing allow.
This course is repeatable for 12 credits.
Recommended: 9 credits of theatre arts

TA 543. COSTUME DESIGN. (3 Credits)
Theory and practice of designing costumes for a theatrical production.
Recommended: TA 243

TA 550. STUDIO: THEATRE ARTS. (3-6 Credits)
Advanced individual study on approved projects in one of the arts of the theatre: acting, directing or scene/costume/lighting design; or in stage or theatre management.
This course is repeatable for 6 credits.
Recommended: 9 credits of upper-division theatre arts

TA 554. ADVANCED PLAY DIRECTION. (3 Credits)
Expanded exploration of directing theories and techniques. Practical application through the production of a one-act play in a laboratory theatre. Offered alternate years.
Recommended: TA 354

Tourism, Recreat, Adven. Lead. (TRAL)

TRAL 110. INTRODUCTION TO WHITE WATER KAYAKING. (2 Credits)
Students will learn fundamentals of white water kayaking in sheltered & moving water based on the internationally recognized British Canoe (BC) and American Canoe Association (ACA) teaching and skills certification systems. Emphasis is on activity and basic skills.

TRAL 111. INTRODUCTION TO CANOEING. (2 Credits)
Students will learn fundamentals of canoeing in sheltered & moving water based on the internationally recognized British Canoe (BC) and American Canoe Association (ACA) teaching and skills certification systems. Emphasis is on activity and basic skills.

TRAL 115. OUTDOOR LIVING SKILLS. (2 Credits)
Educates and introduces students on how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. Classroom and field (lab) experience. Includes one mandatory weekend overnight outing. CROSSLISTED as PAC 115/TRAL 115.
Corequisites: TRAL 118
Equivalent to: PAC 115
This course is repeatable for 4 credits.
TRAL 118. LABORATORY FOR OUTDOOR LIVING SKILLS. (1 Credit)
Practical field application of concepts learned in PAC 115/TRAL 115, Outdoor Living Skills. Field (lab) experience includes one mandatory weekend overnight. Introduces how to travel safely in the backcountry through proper preparation, risk awareness, Leave No Trace ethics, terrain recognition, navigation, and camp craft. CROSSLISTED as PAC 118/TRAL 118.
Corequisites: TRAL 115
Equivalent to: PAC 118
This course is repeatable for 2 credits.

TRAL 130. INTRODUCTION TO OUTDOOR AND ADVENTURE PROFESSIONS. (3 Credits)
Outdoor and adventure professions will be explored. Introduces students to practical and conceptual aspects of land and water trips in outdoor tourism, adventure, and educational settings. Innovative people and products will be examined in the context of outdoor and adventure professions and their impact; past, present, and future.
Equivalent to: TOL 130

TRAL 132. FOUNDATIONS AND HISTORY OF OUTDOOR AND ADVENTURE PROFESSIONS. (3 Credits)
History, evolution, and theoretical underpinning of outdoor and adventure professions as an important and evolving feature of Western culture within the United States and beyond. Influential ideas, paradigm shifts, events, and developments that have led to professionalism, institutionalization, dissemination, and impact on other subject areas and professions. Impact of other cultures on current state of the professions.
(Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
Equivalent to: TOL 132

TRAL 173. INTERMEDIATE ROCK CLIMBING. (2 Credits)
Introduces variety of basic skills, gear and systems that will allow them to safely participate in a single pitch rock climbing environment based on internationally recognized American Mountain Guides Association (AMGA) teaching and skills certification systems. Presents students with various technical skills that will serve as a foundation for future land-based outdoor disciplines. Students will be introduced to gear, such as software (ropes, webbing, harnesses) and hardware (carabiners, friction devices); skills, such as knots, belaying, rappelling, lead climbing; and systems such as anchors and basic rescue techniques. CROSSLISTED as PAC 173/TRAL 173.
Equivalent to: PAC 173
This course is repeatable for 10 credits.

TRAL 215. GROUP FACILITATION. (4 Credits)
Introduces facilitation, leadership, and management of groups. Group facilitation theory, techniques, and models for use in a variety of environments and with different populations. Prominent personality types and how to effectively facilitate these. Determining needs, utilizing appropriate techniques, sequencing, and processing to meet specific determined needs of groups.

TRAL 217. INTERMEDIATE ROCK. (2 Credits)
 Begins by affirming rock site management foundational skills such as proper equipment, knots, belay techniques, rappelling, and basic climbing anchor systems. Then focuses on building upon those foundational skills by covering more complex anchor systems, belay techniques, vertical rescues, releasable rappels, and movement through various rock specific terrains.
Recommended: TRAL 172 or similar training and equivalent skill level

TRAL 218. ROCK SITE MANAGEMENT. (2 Credits)
Begins by affirming Intermediate Rock foundational skills such as proper equipment, knots, belay & lead climbing techniques, movement, rappelling, and basic climbing anchor systems based on internationally recognized American Mountain Guides Association (AMGA) teaching and skills certification systems. Class will then focus on building upon those foundational skills by covering more complex anchor systems, belay techniques, vertical rescues, releasable rappels and movement through various rock specific terrains.
Prerequisites: TRAL 173 with C or better or PAC 173 with C or better

TRAL 251. RECREATION RESOURCE MANAGEMENT. (4 Credits)
Overview of recreation resource management including study of land and water resources used for outdoor recreation. The planning and management of natural and cultural resources for long-term resource productivity, with a focus on rural and wildlife areas of the forest, range and coast.
Equivalent to: FES 251

TRAL 260. INTERMEDIATE PADDLESPORT. (2 Credits)
Learn how to successfully paddle as a competent group member within moving water & whitewater environments up to class III. This course will emphasize that the student has a holistic approach to river running, can be an effective group member during river rescues, can contribute to the safety, group skills and leadership of a river descent and showcase the knowledge required of an intermediate whitewater paddler based on internationally recognized British Canoe (BC) and American Canoe Association (ACA) teaching and skills certification systems. Uses a variety of diverse whitewater specific kayaks and canoes.
Prerequisites: (TRAL 110 with C or better or PAC 110 with C or better) and (TRAL 111 [C] or PAC 111 [C])

TRAL 270. PRE-INTERNSHIP SEMINAR. (1 Credit)
Exploration of career goals, internship opportunities, and the variety of practice areas in the tourism, recreation, and adventure leadership (TRAL) professions. Student preparation in planning, obtaining, and completing TRAL internships. The course is designed to assist undergraduate majors in TRAL prepare for the required internship. Graded P/N.
Equivalent to: TOL 270

TRAL 280. OUTDOOR LEADERSHIP FUNDAMENTALS. (3 Credits)
A week-long outdoor expedition focusing on water-based and land-based skills while developing a comprehensive understanding of expedition behavior. Students will meet in the classroom to prepare for the week-long field expedition covering various topics such as risk management, expedition planning, navigation, water safety and other topics. The expedition will expose students to extended travel in the backcountry while further developing technical and interpersonal skills.
Prerequisites: (TRAL 110 with C or better or PAC 110 with C or better) and (TRAL 111 [C] or PAC 111 [C]) and TRAL 115 [C] and TRAL 118 [C] and TRAL 173 [C]

TRAL 299. SPECIAL TOPICS. (0-16 Credits)
Topics of current importance in tourism, recreation, and/or adventure leadership education. Topics will change from term to term. May be repeated with different topics for credit.
This course is repeatable for 16 credits.

TRAL 309. CERTIFICATION PRACTICUM. (2 Credits)
Allows students the opportunity to acquire nationally or internationally recognized certification in one or more disciplines. Will provide an avenue for students to acquire professional faculty guidance and mentoring so they are more able to attain a certification.
This course is repeatable for 6 credits.
TRAL 351. OUTDOOR RECREATION MANAGEMENT ON PUBLIC LANDS. (3 Credits)
Explores current issues and problems in outdoor recreation management on public lands and approaches to address these. Emphasis on day-to-day, field-based management of recreation resources, rather than broad-scale planning.
Prerequisites: TRAL 251 with C- or better or FES 251 with C- or better
Equivalent to: FES 351

TRAL 352. WILDERNESS MANAGEMENT. (3 Credits)
Wilderness as land use concept. Wilderness history, preservation, planning and management. Wilderness in the context of other land uses.
Equivalent to: FES 352

TRAL 353. NATURE, ECO, AND ADVENTURE TOURISM. (3 Credits)
Introduces students to natural resource-based tourism issues in both domestic and international contexts. Explores distinctions between nature, eco, and adventure tourism and other forms of tourism, positive and negative impacts, and contemporary issues such as accreditation/certification, and sustainable design.
Equivalent to: FES 353

TRAL 354. COMMUNITIES, NATURAL AREAS, AND SUSTAINABLE TOURISM. (3 Credits)
Introduces students to macro-level community and regional issues associated with tourism in natural areas. Explores positive and negative community impacts associated with tourism, traditional government-based tourism management and policies; community-based tourism management, and partnerships and stakeholder collaboration. Domestic and international examples are used to illustrate concepts and principles.
Equivalent to: FES 354

TRAL 357. *PARKS AND PROTECTED AREAS MANAGEMENT. (3 Credits)
Provides a broad yet comprehensive understanding of the theories, problems, and techniques of managing parks, wild and scenic rivers, wilderness, and other protected areas. Covers the evolution of policies and recent issues in management of these protected areas, in the United States and around the world. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: FES 357

TRAL 370. DESIGN AND MANAGEMENT OF OUTDOOR EXPERIENCES. (4 Credits)
Introduction to pedagogical, administrative, and organizational knowledge, skills, and dispositions for effective design and management of effective short and extended duration outdoor experiences in wilderness-like areas. Covers personnel logistics, site planning, itinerary planning, educational and skills progression, communication with volunteers and program contacts, budgets.
Prerequisites: TRAL 280 with C or better or TOL 375 with C or better
Equivalent to: TOL 370
Recommended: Junior standing

TRAL 372. ETHICS AND ADVENTURE LEADERSHIP. (3 Credits)
Examines ethical issues and situations inherent in adventure leadership and other experiential education settings. Leading adventure programs entails judgment-laden decisions that are made every hour of every day concerning participants, leaders, and programs. Students will become familiar with predominant ethical theories and apply these theories to practical situations with a view to assessing the values that influence their decisions and subsequent actions. Students will better understand how their decisions influence their professional work and those of others within the context of adventure leadership.
Equivalent to: TOL 372
Recommended: TOL 375 or TRAL 375 or other writing intensive course

TRAL 373. WILDERNESS AND ADVENTURE EDUCATION. (4 Credits)
Rationale for and methods used in the application of wilderness and outdoor adventure education programs in education, recreation, corporate and human service settings. Covers historical and contemporary philosophies and practices in adventure education, with a primary emphasis on outdoor adventure education. Explores the educational, social, and ethical consequences of outdoor adventure education programs. Also explores the role of wilderness in the context of the United States and differing views of what constitutes wilderness from an international perspective.
Equivalent to: TOL 373
Recommended: TRAL 375 or TOL 375

TRAL 374. OUTDOOR ADVENTURE EDUCATION. (3 Credits)
Rationale for and methods used in the application of outdoor adventure education programs in education, recreation, corporate and human service settings. Historical and contemporary philosophies and practices in outdoor adventure education. Explores the educational, social, and ethical consequences of outdoor adventure education programs.
Examines outdoor adventure education in the context of the United States and differing paradigms informing the practice in other cultures internationally. Presents current research in outdoor adventure education.
Prerequisites: TRAL 130 with C or better and TRAL 132 [C] and TRAL 215 [C]

TRAL 375. *EXPERIENTIAL EDUCATION. (4 Credits)
Theory, techniques, and practice of experiential education. Students will define learning objectives, design curriculum, develop teaching materials, and effectively teach a variety of audiences. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: TOL 375

TRAL 377. EXPEDITIONS I WATER. (5 Credits)
A field-based course that develops the knowledge, skills, and dispositions needed to safely and effectively lead, and participate in, an extended water-based expedition of one week or longer. Technical skill emphasis is on whitewater kayaks and/or rafts and/or canoes with an additional focus on swift water rescue skills.
Prerequisites: TRAL 370 with C or better and TRAL 260 [C]
Corequisites: TRAL 379
Recommended: MTH 111

TRAL 378. TOURISM AND RECREATION DATA ANALYSIS. (3 Credits)
Introduces students to descriptive and inferential statistics. The focus is on 1) applying relevant statistical analyses to tourism and recreation data and 2) interpreting results.
Equivalent to: TOL 378
Recommended: MTH 111

TRAL 379. EXPEDITIONS II-LAND. (10 Credits)
This is a field-based course that develops the knowledge, skills, and dispositions needed to safely and effectively lead and participate in an extended backcountry expedition of three weeks or longer. Emphasis is on mountaineering skills in a backcountry context.
Prerequisites: TRAL 370 with C or better
Corequisites: TRAL 377
Equivalent to: TOL 379

TRAL 399. SPECIAL TOPICS. (0-16 Credits)
Topics of current importance in tourism, recreation, and/or adventure leadership education. Topics will change from term to term. May be repeated with different topics for credit. This course is repeatable for 16 credits.
TRAL 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: TOL 401
This course is repeatable for 16 credits.

TRAL 406. PROJECTS. (1-16 Credits)
Equivalent to: TOL 406
This course is repeatable for 16 credits.

TRAL 410. INTERNSHIP. (1-16 Credits)
Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. Graded P/N.
Equivalent to: TOL 410
This course is repeatable for 16 credits.

Recommended: FES 251 and FES 351 and FES 356 and FOR 391 and FOR 407

TRAL 432. ECONOMICS OF RECREATION AND TOURISM. (3 Credits)
Applications of economic theory, concepts, and methods to outdoor recreation and nature-based tourism resources, projects and plans. Key topics include analyses of economic impacts, benefits and costs, demand and supply, and non-market valuation (e.g., revealed, stated, and benefit transfer methods).
Equivalent to: FES 432
Recommended: (AEC 350, ECON 201 or 201H) and (ST 202 or 202H)

TRAL 456. PLANNING FOR SUSTAINABLE RECREATION. (4 Credits)
Concepts related to the creation and design of outdoor recreation plans. Techniques for collecting data pertaining to visitor experiences and preferences. Recreation planning at several levels, both for public and private lands, with emphasis on larger scale site planning where recreation is integrated with other resource uses. Lec/lab.
Prerequisites: TRAL 251 with C- or better or FES 251 with C- or better
Equivalent to: FES 456

TRAL 457. PLANNING FOR SUSTAINABLE TOURISM. (4 Credits)
Examines relationships among tourists, tourism developments, and the planning of tourist attractions and services. Focuses on planning tourist resources and programs within a geographic region, as well as at both the destination and site levels. Planning tools and design concepts are reviewed, analyzed, and applied. Lec/lab.
Prerequisites: TRAL 251 with C or better or FES 251 with C or better
Equivalent to: FES 457

TRAL 474. ENTREPRENEURSHIP IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP. (3 Credits)
Creation and management of tourism and outdoor leadership businesses. Covers principles of running a successful business and includes special considerations for operations on public lands (e.g., concessionaires).
Equivalent to: TOL 474
Recommended: BA 101

TRAL 476. RISK MANAGEMENT IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP. (3 Credits)
Risk management in tourism and outdoor leadership from an operational perspective. Focuses on risk in tourism and outdoor education programs as a contributing factor for learning, growth, and satisfaction of client motivations. Covers the nature of accidents in outdoor settings, addresses the practitioner’s perspective of risk in the field, and describes theories and methods of implementing risk management. Covers the ethics of utilizing risk and potentially dangerous activities as a basis for enhancing client education and experience.
Equivalent to: TOL 476

TRAL 477. ADVENTURE THERAPY. (3 Credits)
Provides students with an overview of adventure therapy, including its history, theory, current status and future trends. Includes program design, ethical issues, and best practices in the field.
Equivalent to: TOL 477

TRAL 478. LEGAL ISSUES IN TOURISM, RECREATION, AND ADVENTURE LEADERSHIP. (3 Credits)
Covers the legal dimensions of tourism and outdoor leadership activities. Students will learn about the civil and criminal judicial system from a tourism and outdoor leadership perspective. They will learn to apply risk management methodologies and instruments, such as contracts, insurance, waivers and releases to address legal liability. The basic principles of intentional and negligent torts will be discussed, with an emphasis on practical applications. Also covers employment issues and general business law, including business structure and the use of entities as liability shields.
Prerequisites: TRAL 375 with C- or better or TOL 375 with C- or better
Equivalent to: TOL 478

TRAL 493. ENVIRONMENTAL INTERPRETATION. (4 Credits)
Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers.
Equivalent to: FES 493

TRAL 499. SPECIAL TOPICS. (1-16 Credits)
Topics of current importance in forest resources issues, education, policies, economics, management, business, social values, silviculture, and biometrics. Topics will change from term to term. May be repeated with different topics for credit. Section 8: Social aspects of natural resource management (3 credits) graded.
Equivalent to: TOL 499
This course is repeatable for 16 credits.

TRAL 593. ENVIRONMENTAL INTERPRETATION. (4 Credits)
Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers.
Equivalent to: FES 593

Toxicology (TOX)

TOX 003. UNDERGRADUATE RESEARCH. (0 Credits)
Students engage in research activities appropriate to their discipline; and through the research experience, to acquire skills, techniques, and knowledge relevant to their field of study. In consultation with a faculty mentor, students will engage in research activity, and make and execute a plan for a project.
TOX 230X. HUMANS AND THE OCEAN. (3 Credits)
An introduction to marine science and the history of humans’ interaction with the ocean. Lectures, group and individual library research, fieldtrips, and assignments will collate approaches from marine science, history, literary study, and other scientific and humanistic disciplines to introduce course material. Topics include oceanographic exploration, fishing and overfishing, and marine pollution. CROSSLISTED as ENG 230X/FW 230X/TOX 230X.
Equivalent to: ENG 230X, FW 230X

TOX 360. *THE WORLD OF POISONS. (3 Credits)
Provides a basic understanding of how we are exposed and respond to chemicals, examples of human diseases associated with toxic insult, the role of technology and the interface of society and toxicology in risk perception and legislation. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Recommended: One 3-credit course in chemistry or one 3-credit course in biology.

TOX 401. RESEARCH. (1-16 Credits)
Equivalent to: AC 401
This course is repeatable for 16 credits.

TOX 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: AC 405
This course is repeatable for 16 credits.

TOX 411. FUNDAMENTALS OF TOXICOLOGY. (3 Credits)
Introduction to the discipline of toxicology. Examination of the basic concepts that define how chemicals are absorbed, distributed, metabolized, and eliminated by the body. Overview of associated dose/response relations.
Prerequisites: BB 350 (may be taken concurrently) with D- or better or BB 450 (may be taken concurrently) with D- or better or BB 490 (may be taken concurrently) with D- or better

TOX 413. ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Procedures for defining exposure and the use of toxicological data in defining risk assessment. Recent application of mechanistic concepts are reviewed.
Prerequisites: TOX 411 with D- or better

TOX 429. TOXIC SUBSTANCES IN FOOD. (3 Credits)
Toxicology and epidemiology of human exposures to pesticides and food toxicants.
Prerequisites: BB 350 (may be taken concurrently) with D- or better or BB 450 (may be taken concurrently) with D- or better or BB 490 (may be taken concurrently) with D- or better
Equivalent to: TOX 429H

TOX 430. CHEMICAL BEHAVIOR IN THE ENVIRONMENT. (3 Credits)
Applications of chemical concepts in the definition and solution of pollution problems; analytical considerations, thermodynamic factors influencing movement of chemicals, physical and metabolic transformations occurring in the environment.
Prerequisites: CH 123 with D- or better or CH 331 with D- or better

TOX 435. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: FES 435, FES 435H, TOX 435H
Recommended: One quarter each of biology and chemistry

TOX 435H. *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: BI 435, BI 435H, FES 435, FS 435, FS 435H, TOX 435
Recommended: One quarter each of biology and chemistry

TOX 455. ECOTOXICOLOGY: AQUATIC ECOSYSTEMS. (3 Credits)
Focuses on transport, fate, and effects of toxic substances in freshwater ecosystems. There is special emphasis on impacts on fish.
Prerequisites: CH 331 with D- or better

TOX 480. COMPUTATIONAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Provides an in-depth understanding of the current systems biology paradigm for chemical risk and drug safety assessment. Learn about novel technologies in computational chemistry, molecular biology and systems biology used to develop methods for risk assessment, including approaches for chemical prioritization for screening and testing, predictive models for high-throughput hazard identification and utilization of “big data” to determine chemical mechanisms of action and toxicity pathways. Apply these approaches to specific case studies in risk analysis, environmental health and toxicology.
Recommended: One year college chemistry and biology plus introductory toxicology or biochemistry

TOX 490. ENVIRONMENTAL FORENSIC CHEMISTRY. (3 Credits)
Principles of Good Laboratory Practice Standards, methodology, utility and limitations of chemical forensic methods as applied to real investigations.
Recommended: One year of college chemistry and one term of organic chemistry.

TOX 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

TOX 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

TOX 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
TOX 511. FUNDAMENTALS OF TOXICOLOGY. (3 Credits)
Introduction to the discipline of toxicology. Examination of the basic concepts that define how chemicals are absorbed, distributed, metabolized, and eliminated by the body. Overview of associated dose/response relations.
Prerequisites: BB 550 (may be taken concurrently) with C or better or BB 590 (may be taken concurrently) with C or better
TOX 512. TARGET ORGAN TOXICOLOGY. (3 Credits)
Examination of toxicological effects of chemicals at organ level. Normal physiology of the organ system is received.
Prerequisites: TOX 511 with C or better
TOX 513. ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Procedures for defining exposure and the use of toxicological data in defining risk assessment. Recent application of mechanistic concepts are reviewed.
Prerequisites: TOX 511 with C or better
TOX 529. TOXIC SUBSTANCES IN FOOD. (3 Credits)
Toxicology and epidemiology of human exposures to pesticides and food toxicants.
Recommended: Completion or concurrent enrollment in BB 350, BB 450 or BB 490
TOX 530. CHEMICAL BEHAVIOR IN THE ENVIRONMENT. (3 Credits)
Applications of chemical concepts in the definition and solution of pollution problems; analytical considerations, thermodynamic factors influencing movement of chemicals, physical and metabolic transformations occurring in the environment.
Recommended: CH 106 and CH 331 and graduate standing.
TOX 535. GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)
A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as FES 435/TOX 435 and FES 535/MCB 535/TOX 535.
Equivalent to: BI 535, FES 535, FS 535, MCB 535
Recommended: One quarter each of biology and chemistry
TOX 555. ECOTOXICOLOGY: AQUATIC ECOSYSTEMS. (3 Credits)
Focuses on transport, fate, and effects of toxic substances in freshwater ecosystems. There is special emphasis on impacts on fish.
Recommended: CH 331
TOX 557. SCIENTIFIC SKILLS AND ETHICS. (3 Credits)
Acquire a multitude of skills to launch and maintain productive extramurally funded careers as research scientists. Explore the ethical practices, data sharing approaches, and compliance requirements needed to conduct research. Examine the ethical use of human subjects and animals in research. Explore the changing landscape of intellectual property and commercialization policies for scientists. Introduces communication strategies for effective interactions with scientific peers, the general public and research sponsors.
Equivalent to: MCB 557
TOX 575. ADVANCED XENOBIOTIC METABOLISM AND DISPOSITION. (2 Credits)
Course will focus on structure, function and regulation of specific proteins that function in uptake, distribution, metabolism, and excretion of drugs and other chemicals that are foreign to the body (xenobiotics). The course will focus on proteins which are termed Phase I and Phase II xenobiotic metabolizing enzymes and xenobiotic transporters. There will be an emphasis on Cytochrome P450 enzymes and hepatic and renal xenobiotic transporter proteins and their key roles in xenobiotic metabolism and excretion.
Recommended: TOX 512
TOX 580. COMPUTATIONAL TOXICOLOGY AND RISK ASSESSMENT. (3 Credits)
Provides an in-depth understanding of the current systems biology paradigm for chemical risk and drug safety assessment. Learn about novel technologies in computational chemistry, molecular biology and systems biology used to develop methods for risk assessment, including approaches for chemical prioritization for screening and testing, predictive models for high-throughput hazard identification and utilization of “big data” to determine chemical mechanisms of action and toxicity pathways. Apply these approaches to specific case studies in risk analysis, environmental health and toxicology.
Recommended: One year college chemistry and biology plus introductory toxicology or biochemistry
TOX 590. ENVIRONMENTAL FORENSIC CHEMISTRY. (3 Credits)
Principles of Good Laboratory Practice Standards, methodology, utility and limitations of chemical forensic methods as applied to real investigations.
Recommended: One year of college chemistry and one term of organic chemistry.
TOX 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
TOX 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.
TOX 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.
TOX 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
TOX 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
TOX 611. TESTING FOR GENOTOXICITY. (4 Credits)
A lab-based course geared toward toxicology, biochemistry, biology, food science, nutrition, pharmacy and MCB students. Introduces principles and methods of several key assays used to screen for DNA damage and mutation. These tests will include the following: (i) Salmonella mutagenicity assay (‘Ames test’), (ii) single cell gel electrophoresis (‘comet’) assay, (iii) micronucleus assay, and (iv) PCR-based single strand conformation polymorphism (SSCP) screening for oncogene/tumor suppressor gene mutation in cancers. This 2-week, intensive lab/lecture class runs Mon-Fri in the LPSC during the first session of summer term. Each day includes laboratory work and a 2-hour lecture covering basic principles of the assays, as well as technical details of the experiment for the day.
Prerequisites: TOX 514 with C or better
Recommended: BB 400 series, prior course work on DNA repair and mutagenesis
TOX 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
TOX 808. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

Twentieth Century Studies (TCS)

TCS 407. SEMINAR. (1-12 Credits)
Advanced study of selected topics related to issues and problems in the twentieth century introduced in TCS core course offerings. Section I seminars will be graded pass/no pass and carry 1 credit; other sections will be graded A-F and will carry variable credit.
This course is repeatable for 16 credits.

TCS 507. SEMINAR. (1-12 Credits)
Advanced study of selected topics related to issues and problems in the Twentieth Century introduced in TCS core course offerings. Section I seminars will be graded P/N and carry 1 credit; other sections will be graded A-F and will carry variable credit.
This course is repeatable for 16 credits.

University Experience (UEXP)

UEXP 111. INTRODUCTION TO RESIDENTIAL EDUCATION. (2 Credits)
Provides an interactive learning environment where participants will both acquire and apply the fundamental knowledge necessary to effectively assist college students as they navigate through their collegiate experiences in a residential setting.

UEXP 199. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

UEXP 290. INFORMATION AND GLOBAL SOCIAL JUSTICE. (3 Credits)
In preparing for any trip, many questions come up. In this course you will ask yourself questions, from the simple to the more complex. We will begin class on the OSU campus and continue on location in Spain or Italy. In-country, you will immerse in the local culture via a homestay, participate in service-learning, visit museums, explore cultural and historic locations, and attend lectures. While seeking answers to our questions we will reflect on the forces (politics, access, linguistic, economic, etc.) that affect the information available to us. This class has no language requirement.

UEXP 299. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

UEXP 399. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

UEXP 406. SPECIAL PROJECTS. (2 Credits)
Trains new ambassadors to lead campus and housing tours. Creates educated, ethically and morally responsible, fully confident TOUR (Team of Undergraduate Recruiters) Ambassadors who are engaged, reflective, creative, and caring members of their communities who can contribute to the success of prospective and new students.

UEXP 407. SEMINAR. (1-16 Credits)
Equivalent to: AHE 407
This course is repeatable for 16 credits.

UEXP 410. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

UEXP 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Veterinary Medicine Biomedical (VMB)

VMB 110. PREVETERINARY MEDICINE. (1 Credit)
Introduction to the profession’s role in society. Graded P/N.
Equivalent to: VM 110

VMB 328. WILDLIFE CAPTURE AND IMMOBILIZATION. (2 Credits)
Manual and chemical restraint methods are covered with an emphasis on darting equipment, animal and human safety, drug pharmacology and species specific recommendations. CROSSTLISTED as FW 328/VMB 328.
Equivalent to: FW 328
This course is repeatable for 4 credits.

VMB 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

VMB 415. ONE HEALTH IN PRACTICE. (3 Credits)
One health is the concept that human, animal and environmental health are all intertwined. Utilizes current one health issues such as disease outbreaks and antimicrobial resistance to encourage students from diverse fields to develop interdisciplinary collaboration and communication skills. CROSSTLISTED as BHS 415/VMB 415.
Equivalent to: BHS 415

VMB 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

VMB 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 501
This course is repeatable for 16 credits.

VMB 503. THESIS. (1-12 Credits)
Equivalent to: VM 503
This course is repeatable for 999 credits.

VMB 504. WRITING AND CONFERENCE (NON-THESIS). (1-9 Credits)
This course is repeatable for 9 credits.

VMB 505. READING AND CONFERENCE. (1-16 Credits)
Graded P/N.
Equivalent to: VM 505
This course is repeatable for 16 credits.

VMB 517. VETERINARY PHYSIOLOGY. (5 Credits)
Physiology of body fluids, muscles, membranes, intermediary metabolism, cardiovascular system, and metabolism.
Equivalent to: VM 517

VMB 518. VETERINARY PHYSIOLOGY. (5 Credits)
Physiology of gastrointestinal, endocrine and reproductive systems.
Prerequisites: VMB 517 with C or better
Equivalent to: VM 518

VMB 519. VETERINARY PHYSIOLOGY. (4 Credits)
Physiology of respiratory and renal systems and acid-base balance.
Prerequisites: VMB 518 with C or better
Equivalent to: VM 519
VM 521. ANIMAL MODELS. (3 Credits)
Selection/use criteria for models describing animal or human diseases or processes with emphasis on experimental design, validation, transgenic technology, population dynamics, husbandry, and ethics.

VM 523. ZOONOSES. (3 Credits)
Interactive examination of the molecular basis of diseases that are transmissible between animals and humans. Emphasis on bacterial, viral and parasitic pathogens of animals and humans.

VM 601. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 601
This course is repeatable for 16 credits.

VM 603. THESIS. (1-16 Credits)
Equivalent to: VM 603
This course is repeatable for 999 credits.

VM 604. WRITING AND CONFERENCE (NON-THESIS). (1-9 Credits)
This course is repeatable for 9 credits.

VM 605. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: VM 605
This course is repeatable for 16 credits.

VM 606. PROJECTS. (1-16 Credits)
Graded P/N.
Equivalent to: VM 606
This course is repeatable for 16 credits.

VM 607. SEMINAR. (1-16 Credits)
One-credit section; VMB 607 Sect. 1. Graded P/N.
Equivalent to: VM 607
This course is repeatable for 16 credits.

VM 611. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 611

VM 612. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 612

VM 613. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 613

VM 614. VETERINARY MICROSCOPIC ANATOMY. (4 Credits)
Structure and development of cells, tissues, organs, and organ systems of animals.
Equivalent to: VM 614

VM 615. VETERINARY MICROSCOPIC ANATOMY. (3 Credits)
Structure and development of cells, tissues, organs, and organ systems of animals.
Equivalent to: VM 615

VM 616. VETERINARY NEUROSCIENCES. (4 Credits)
Structural and functional relationships of the nervous system and organs of special sense with emphasis on general clinical application.

VM 620. VETERINARY IMMUNOLOGY. (5 Credits)
Clinical and diagnostic aspects of immunological mechanisms, serological reactions; hypersensitivity, allergy, and disorders of the immune system.
Equivalent to: VM 620

VM 621. GENERAL PATHOLOGY. (4 Credits)
General principles of pathology, cell injury and death, inflammation and tissue repair, abnormalities of cell growth, and structures and mechanisms of disease.
Equivalent to: VM 621

VM 622. PATHOLOGY LABORATORY. (1 Credit)
Laboratory instruction to complement VM 621.
Prerequisites: VM 611 (may be taken concurrently) with C or better
Equivalent to: VM 622

VM 624. ANTIBIOTIC STEWARDSHIP. (1 Credit)
Elective course for students to learn about significant aspects of antibiotic resistance. Intended to become part of the “One Health Program”, resulting in the ability to create a plan for effective antibiotic stewardship as it relates to human, animal, and environmental health.

VM 627. ORNAMENTAL FISH MEDICINE. (2 Credits)
An introduction to the basic principles of ornamental fish medicine including basic husbandry, handling and clinical procedures. This is a 1-week intensive course held at the Hatfield Marine Science Center in Newport, Oregon. Graded P/N.

VM 630. MECHANISMS OF DISEASE. (3 Credits)
Cellular and molecular events that contribute to the pathogenesis of disease in animals, including humans. Host interactions with infectious agents and the environment.
Equivalent to: VM 630

VM 631. MATHEMATICAL MODELING OF BIOLOGICAL SYSTEMS. (3 Credits)
The use of mathematical modeling in biological sciences is studied. A variety of modeling techniques are covered including implementing the methods computationally.

VM 640. SEMINARS IN LABORATORY ANIMAL MEDICINE. (2 Credits)
Prepares students for careers in laboratory animal medicine. Provides a review of medical conditions, diagnosis and treatment of research animals.

VM 641. SEMINARS IN LABORATORY ANIMAL MEDICINE. (2 Credits)
Prepares students for careers in laboratory animal medicine. Provides a review of medical conditions, diagnosis and treatment for research animals.

VM 642. SEMINARS IN LABORATORY ANIMAL MEDICINE. (2 Credits)
Prepares students for careers in laboratory animal medicine. Provides a review of medical conditions, diagnosis and treatment for research animals.

VM 651. SELECTED TOPICS IN VETERINARY MEDICINE. (3 Credits)
Topics vary; check Schedule of Classes for particular topics.
Equivalent to: VM 651

VM 652. CANCER SYSTEMS BIOLOGY. (3 Credits)
Overview of systems biology approaches that are being used to study cancer, with an emphasis on omics techniques and fundamental mechanisms in the origination and progression of cancer. Discussion-based, with each class session focused on a contemporary research article in the field of cancer systems biology.

VM 653. VETERINARY VIROLOGY. (4 Credits)
Virology for the professional and graduate student.

VM 659. VETERINARY BACTERIOLOGY AND MYCOLOGY. (5 Credits)
Veterinary bacteriology and mycology for the veterinary graduate student.
VMB 660. VETERINARY PARASITOLOGY. (5 Credits)
A study of the parasitic diseases of domestic animals with an emphasis on diagnosis and treatment. Fundamentals in host-parasite interactions, taxonomy and life cycle strategies are covered.

VMB 663. VETERINARY DIAGNOSTIC PATHOLOGY. (6 Credits)
Practical hands-on course training students in the diagnostic pathology utilizing case material received at the OSU Veterinary Diagnostic Lab. Graded P/N.

VMB 664. COMPARATIVE MICROSCOPIC PATHOLOGY. (1 Credit)
Case-based discussion course to train participants in the recognition, description, and pathogenesis of a wide variety of disease processes with an emphasis on microscopic features. Graded P/N. 
This course is repeatable for 4 credits.

VMB 665. READINGS IN VETERINARY PATHOLOGY. (1 Credit)
Group discussions of assigned readings central to understanding of veterinary pathology, including recent advances. Graded P/N. 
This course is repeatable for 6 credits.

VMB 666. VETERINARY MEDICINE AND PUBLIC HEALTH. (3 Credits)
Covers aspects of veterinary medicine that affect human health. An understanding of the contribution of the veterinary profession to human (public) health will enable students to play an effective role in this area, regardless of career direction.

VMB 667. VETERINARY EPIDEMIOLOGY. (3 Credits)
A course for veterinary students describing the factors determining the frequency and distribution of diseases, in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.

VMB 669. INTRODUCTION TO GRANT PROPOSAL WRITING. (2 Credits)
To introduce students to the fundamentals of writing grant proposals to the National Institute of Health (NIH), different funding mechanisms, as well as the grant reviewing process. CROSSLISTED as PHAR 669/ VMB 669.
Equivalent to: PHAR 669
This course is repeatable for 20 credits.

VMB 670. INTRODUCTION TO SYSTEMS BIOLOGY. (2 Credits)
Students will gain a high-level overview of systems biology and bioinformatics, with an emphasis on biomedical applications, integration of ‘omics’ approaches, and biological networks.

VMB 671. MOLECULAR TOOLS. (3 Credits)
Intended for personnel with some scientific background who are seeking basic- and advanced-level molecular biology knowledge and who wish to become involved with molecular biology-related and biotechnological research. CROSSLISTED as MCB 671/VMB 671.
Equivalent to: MCB 671

VMB 672. MOLECULAR APPROACH TO CANCER. (1 Credit)
Overview of cancer pathogenesis and current molecular techniques to diagnose and treat various neoplasms is provided. Content will include both veterinary and human data and concepts. Discussion/Lab. Graded P/N.

VMB 673. COMPARATIVE IMMUNOLOGY. (3 Credits)
Examines immune system function in animals other than mice and men with a focus on adapting cutting-edge technologies.

VMB 674. VACCINES AND NEW THERAPIES. (3 Credits)
Provides students with a cohesive understanding of the basic research behind the discovery of new therapeutic targets and scientific advancements used in development of vaccines and new therapies.

VMB 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 99 credits.

VMB 701. RESEARCH. (1-16 Credits)
Equivalent to: VM 701
This course is repeatable for 16 credits.

VMB 705. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: VM 705
This course is repeatable for 16 credits.

VMB 706. PROJECTS. (1-16 Credits)
Equivalent to: VM 706
This course is repeatable for 16 credits.

VMB 709. VETERINARY MEDICINE ORIENTATION. (1 Credit)
An overview of veterinary medicine with emphasis on historical development, current veterinary medical issues, employment opportunities, and professionalism. Graded P/N.

VMB 711. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken.
Equivalent to: VM 711

VMB 712. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken. Lec/lab.
Equivalent to: VM 712

VMB 713. VETERINARY GROSS ANATOMY. (4 Credits)
Systematic and topographic study and dissection of the dog, cat, horse, ruminant, pig, and chicken. Lec/lab.
Equivalent to: VM 713

VMB 714. VETERINARY MICROSCOPIC ANATOMY. (4 Credits)
Structure and development of cells, tissues, organs, and organ systems of animals.
Equivalent to: VM 714

VMB 715. VETERINARY MICROSCOPIC ANATOMY. (3 Credits)
Structure and development of cells, tissues, organs, and organ systems of animals.
Equivalent to: VM 715

VMB 716. VETERINARY NEUROSCIENCES. (4 Credits)
Structural and functional relationships of the nervous system and organs of special sense with emphasis on general clinical application.
Equivalent to: VM 716

VMB 717. VETERINARY PHYSIOLOGY. (5 Credits)
Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation.
Equivalent to: VM 717

VMB 718. VETERINARY PHYSIOLOGY. (5 Credits)
Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation. Lec/lab.
Equivalent to: VM 718

VMB 719. VETERINARY PHYSIOLOGY. (4 Credits)
Physiology of body fluids, excretion, respiration, acid-base balance, blood, muscle, bone, cardiovascular system, digestion, metabolism, endocrine system, reproduction, and lactation. Lec/lab.
Equivalent to: VM 719
VMB 720. VETERINARY IMMUNOLOGY. (5 Credits)
Clinical and diagnostic aspects of immunological mechanisms,
serological reactions, hypersensitivity, allergy, and disorders of the
immune system. Lec/lab.
Equivalent to: VM 720

VMB 721. VETERINARY PATHOLOGY. (5 Credits)
Basic mechanisms and concepts relating to reaction of cells and
tissues to disease, with emphasis on cellular and tissue degeneration,
inflammatory reaction, circulatory disturbance and neoplasia. Lec/lab.
Equivalent to: VM 721

VMB 722. RESEARCH READING SKILLS FOR VETERINARY STUDENTS. (1 Credit)
Training in critical evaluation of biomedical and clinical research studies,
and understanding of laboratory diagnostic methods.

VMB 723. VETERINARY LEADERSHIP: INCLUSION, REFLECTION,
DEVELOPMENT. (1 Credit)
Focusing on diversity and inclusion, self-compassion, and effective
interpersonal communication in relationship to fostering leadership in
veterinary medicine. Graded P/N. This course is repeatable for 10 credits.

VMB 724. ANTIBIOTIC STEWARDSHIP. (1 Credit)
Elective course for students to learn about significant aspects of
antibiotic resistance. Intended to become part of the "One Health
Program", resulting in the ability to create a plan for effective antibiotic
stewardship as it relates to human, animal, and environmental health.

VMB 726. PET BIRD AND SMALL MAMMAL MEDICINE AND SURGERY. (2 Credits)
Medicine and surgery of pet birds and small animals. Graded P/N.

VMB 727. ORNAMENTAL FISH MEDICINE. (2 Credits)
An introduction to the basic principles of ornamental fish medicine
including basic husbandry, handling and clinical procedures. Graded P/N.

VMB 728. SPECIAL ANIMAL MEDICINE. (4 Credits)
Diagnosis, treatment, and management of special animals, including the
common laboratory animals.
Equivalent to: VM 728 This course is repeatable for 8 credits.

VMB 729. LAB ANIMAL/PRIMATE MEDICINE AND SURGERY. (3-12 Credits)
Designed to provide hands-on experience with a variety of laboratory
animal species including primates, rodents, ungulates, fish, and reptiles.
May be repeated up to 4 times for 3, 6, 9 or 12 credits per term. 12 credits
maximum apply toward graduation. Graded P/N. This course is repeatable for 12 credits.

VMB 730. LARGE ANIMAL MEDICINE AND SURGERY LABORATORY. (1 Credit)
Development of physical examination skills and common diagnostic and
surgical procedures for domestic large animal species.

VMB 736. DIAGNOSTIC CLINICAL PATHOLOGY. (2 Credits)
One week clinical experience in clinical pathology, cytology, urinalysis,
clinical chemistry interpretation and hematology. Lec/lab.
Equivalent to: VM 736

VMB 740. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
The first of three 1-credit courses in problem solving and integration of
clinical cases and basic sciences in the veterinary curriculum.
Equivalent to: VM 740

VMB 741. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
The second of three 1-credit courses in problem solving and integration of
clinical cases and basic sciences in the veterinary curriculum.
Equivalent to: VM 741

VMB 742. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
The third of three 1-credit courses in problem solving and integration of
clinical cases and basic sciences in the veterinary curriculum. Graded P/N.
Equivalent to: VM 742

VMB 743. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
A course in problem solving and integration of clinical cases and basic
sciences in the veterinary curriculum. Students learn through interaction
with their peers and with independent study outside of class. Graded P/N.
Equivalent to: VM 743 This course is repeatable for 4 credits.

VMB 744. VETERINARY INTEGRATED PROBLEM SOLVING. (1 Credit)
A course in problem solving and integration of clinical cases and basic
sciences in the veterinary curriculum. Students learn through interaction
with their peers and with independent study outside of class. Graded P/N.
Equivalent to: VM 744

VMB 745. COMMUNICATIONS FOR VETERINARIANS. (1 Credit)
Communications and problem solving for the third-year veterinary
student. Graded P/N.

VMB 749. WILDLIFE SAFARI. (2 Credits)
Clinical training in the care of exotic and zoo animal species. Graded P/N.

VMB 750. SYSTEMIC PATHOLOGY I. (4 Credits)
Examines the principles of system and organ responses to injury and the
consequent effects of these changes on the host.
Equivalent to: VM 7500

VMB 751. SYSTEMIC PATHOLOGY II. (5 Credits)
Examines the principles of system and organ responses to injury and the
consequent effects of these changes on the host.
Equivalent to: VM 751

VMB 753. VETERINARY VIROLOGY. (4 Credits)
Virology for the professional DVM student.
Equivalent to: VM 753

VMB 756. ADVANCED CLINICAL PATHOLOGY. (1 Credit)
One-week rotation in advanced clinical pathology: cytology, hematology
and clinical chemistry interpretation. Graded P/N.
Prerequisites: VM 736 with C or better

VMB 759. VETERINARY BACTERIOLOGY AND MYCOLOGY. (5 Credits)
Bacteriology and mycology for the professional DVM student.
Equivalent to: VM 759

VMB 760. VETERINARY PARASITOLOGY. (5 Credits)
A study of the parasitic diseases of domestic animals with an emphasis
on diagnosis and treatment. Fundamentals in host-parasite interactions,
taxonomy and life cycle strategies are covered.
Equivalent to: VM 760

VMB 761. VETERINARY PHARMACOLOGY. (2 Credits)
Fundamentals of pharmacology as related to veterinary medicine
presented in a systems-oriented approach with drug therapy in domestic
animals.
Equivalent to: VM 761
VMB 762. VETERINARY PHARMACOLOGY II. (4 Credits)
Fundamentals of pharmacology as related to veterinary medicine presented in a systems-oriented approach with drug therapy in domestic animals.
Equivalent to: VM 762

VMB 763. VETERINARY CLINICAL PATHOLOGY. (4 Credits)
Clinical pathology for the professional DVM student.
Equivalent to: VM 763

VMB 765. VETERINARY TOXICOLOGY. (4 Credits)
A study of toxic agents, mechanisms of action, toxicosis and treatments, especially as related to domestic and wild animals, with principles of toxicity testing, clinical diagnosis, and identification of poisonous plants. Lec/lab.
Equivalent to: VM 765

VMB 766. EPIDEMIOLOGY AND PUBLIC HEALTH. (3 Credits)
Examination of the application of epidemiology to the field of veterinary medicine and the study of important veterinary public health issues.
Equivalent to: VM 766

VMB 767. VETERINARY EPIDEMIOLOGY. (3 Credits)
Examines factors determining the frequency and distribution of diseases in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.
Equivalent to: VM 767

VMB 768. BASIC HISTOPATHOLOGY. (1 Credit)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species. Graded P/N.
Prerequisites: VMB 751 with C or better

VMB 769. ANIMAL GENOMICS. (1 Credit)
Discussion about the dog and cow genomes, susceptibility to diseases, and the possibilities and techniques for treatment of medical conditions by gene transfer and modification.

VMB 772. INTERNATIONAL VETERINARY MEDICINE. (2 Credits)
Veterinary students work with veterinarians and domestic animals in international settings. Graded P/N.
This course is repeatable for 4 credits.

VMB 774. LABORATORY ANIMAL MEDICINE. (6 Credits)
Clinical experience related to diagnosis, treatment, and management of laboratory animals. Graded P/N.
Equivalent to: VM 774

VMB 786. ADVANCED HISTOPATHOLOGY. (2 Credits)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species.

VMB 795. DIAGNOSTIC SERVICES. (2 Credits)
Students will perform service duty in the necropsy area of the Veterinary Diagnostic Laboratory and will perform necropsies on delivered specimens. Other activities.

Veterinary Medicine Clinical (VMC)

VMC 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 501
This course is repeatable for 16 credits.

VMB 763. VETERINARY CLINICAL PATHOLOGY. (4 Credits)
Clinical pathology for the professional DVM student.
Equivalent to: VM 763

VMB 765. VETERINARY TOXICOLOGY. (4 Credits)
A study of toxic agents, mechanisms of action, toxicosis and treatments, especially as related to domestic and wild animals, with principles of toxicity testing, clinical diagnosis, and identification of poisonous plants. Lec/lab.
Equivalent to: VM 765

VMB 766. EPIDEMIOLOGY AND PUBLIC HEALTH. (3 Credits)
Examination of the application of epidemiology to the field of veterinary medicine and the study of important veterinary public health issues.
Equivalent to: VM 766

VMB 767. VETERINARY EPIDEMIOLOGY. (3 Credits)
Examines factors determining the frequency and distribution of diseases in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.
Equivalent to: VM 767

VMB 768. BASIC HISTOPATHOLOGY. (1 Credit)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species. Graded P/N.
Prerequisites: VMB 751 with C or better

VMB 769. ANIMAL GENOMICS. (1 Credit)
Discussion about the dog and cow genomes, susceptibility to diseases, and the possibilities and techniques for treatment of medical conditions by gene transfer and modification.

VMB 772. INTERNATIONAL VETERINARY MEDICINE. (2 Credits)
Veterinary students work with veterinarians and domestic animals in international settings. Graded P/N.
This course is repeatable for 4 credits.

VMB 774. LABORATORY ANIMAL MEDICINE. (6 Credits)
Clinical experience related to diagnosis, treatment, and management of laboratory animals. Graded P/N.
Equivalent to: VM 774

VMB 786. ADVANCED HISTOPATHOLOGY. (2 Credits)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species.

VMB 795. DIAGNOSTIC SERVICES. (2 Credits)
Students will perform service duty in the necropsy area of the Veterinary Diagnostic Laboratory and will perform necropsies on delivered specimens. Other activities.

Veterinary Medicine Clinical (VMC)

VMC 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 501
This course is repeatable for 16 credits.

VMB 763. VETERINARY CLINICAL PATHOLOGY. (4 Credits)
Clinical pathology for the professional DVM student.
Equivalent to: VM 763

VMB 765. VETERINARY TOXICOLOGY. (4 Credits)
A study of toxic agents, mechanisms of action, toxicosis and treatments, especially as related to domestic and wild animals, with principles of toxicity testing, clinical diagnosis, and identification of poisonous plants. Lec/lab.
Equivalent to: VM 765

VMB 766. EPIDEMIOLOGY AND PUBLIC HEALTH. (3 Credits)
Examination of the application of epidemiology to the field of veterinary medicine and the study of important veterinary public health issues.
Equivalent to: VM 766

VMB 767. VETERINARY EPIDEMIOLOGY. (3 Credits)
Examines factors determining the frequency and distribution of diseases in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.
Equivalent to: VM 767

VMB 768. BASIC HISTOPATHOLOGY. (1 Credit)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species. Graded P/N.
Prerequisites: VMB 751 with C or better

VMB 769. ANIMAL GENOMICS. (1 Credit)
Discussion about the dog and cow genomes, susceptibility to diseases, and the possibilities and techniques for treatment of medical conditions by gene transfer and modification.

VMB 772. INTERNATIONAL VETERINARY MEDICINE. (2 Credits)
Veterinary students work with veterinarians and domestic animals in international settings. Graded P/N.
This course is repeatable for 4 credits.

VMB 774. LABORATORY ANIMAL MEDICINE. (6 Credits)
Clinical experience related to diagnosis, treatment, and management of laboratory animals. Graded P/N.
Equivalent to: VM 774

VMB 786. ADVANCED HISTOPATHOLOGY. (2 Credits)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species.

VMB 795. DIAGNOSTIC SERVICES. (2 Credits)
Students will perform service duty in the necropsy area of the Veterinary Diagnostic Laboratory and will perform necropsies on delivered specimens. Other activities.

Veterinary Medicine Clinical (VMC)

VMC 501. RESEARCH. (1-16 Credits)
Graded P/N.
Equivalent to: VM 501
This course is repeatable for 16 credits.

VMB 763. VETERINARY CLINICAL PATHOLOGY. (4 Credits)
Clinical pathology for the professional DVM student.
Equivalent to: VM 763

VMB 765. VETERINARY TOXICOLOGY. (4 Credits)
A study of toxic agents, mechanisms of action, toxicosis and treatments, especially as related to domestic and wild animals, with principles of toxicity testing, clinical diagnosis, and identification of poisonous plants. Lec/lab.
Equivalent to: VM 765

VMB 766. EPIDEMIOLOGY AND PUBLIC HEALTH. (3 Credits)
Examination of the application of epidemiology to the field of veterinary medicine and the study of important veterinary public health issues.
Equivalent to: VM 766

VMB 767. VETERINARY EPIDEMIOLOGY. (3 Credits)
Examines factors determining the frequency and distribution of diseases in a defined population of animals for the purpose of establishing programs to prevent and control their development and spread in this population.
Equivalent to: VM 767

VMB 768. BASIC HISTOPATHOLOGY. (1 Credit)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species. Graded P/N.
Prerequisites: VMB 751 with C or better

VMB 769. ANIMAL GENOMICS. (1 Credit)
Discussion about the dog and cow genomes, susceptibility to diseases, and the possibilities and techniques for treatment of medical conditions by gene transfer and modification.

VMB 772. INTERNATIONAL VETERINARY MEDICINE. (2 Credits)
Veterinary students work with veterinarians and domestic animals in international settings. Graded P/N.
This course is repeatable for 4 credits.

VMB 774. LABORATORY ANIMAL MEDICINE. (6 Credits)
Clinical experience related to diagnosis, treatment, and management of laboratory animals. Graded P/N.
Equivalent to: VM 774

VMB 786. ADVANCED HISTOPATHOLOGY. (2 Credits)
a rotation in histopathology at the Veterinary Diagnostic Laboratory. Emphasis is placed on case evaluation, diagnosis and report writing of biopsies of all species.

VMB 795. DIAGNOSTIC SERVICES. (2 Credits)
Students will perform service duty in the necropsy area of the Veterinary Diagnostic Laboratory and will perform necropsies on delivered specimens. Other activities.
VMC 684. TOPICS IN SURGERY. (2-4 Credits)
In-depth investigation of important topics in physiology, pathophysiology, treatment, diagnosis, and other aspects of surgery through investigation of primary literature and recent reviews.
This course is repeatable for 16 credits.

VMC 701. RESEARCH. (1-16 Credits)
Equivalent to: VM 701
This course is repeatable for 16 credits.

VMC 705. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: VM 705
This course is repeatable for 16 credits.

VMC 706. PROJECTS. (1-16 Credits)
Equivalent to: VM 706
This course is repeatable for 16 credits.

VMC 711. CLINICAL CARDIOLOGY. (1-4 Credits)
A one-week clinical elective rotation in cardiology at the Veterinary Teaching Hospital. May be repeated up to 4 times, two weeks or more is encouraged. Fourth-year standing in Veterinary Medicine required. This course is repeatable for 4 credits.

VMC 712. CLINICAL ONCOLOGY. (1-4 Credits)
A one-week elective clinical rotation in oncology at the Veterinary Teaching Hospital. May be repeated up to 4 times, two weeks or more is encouraged. Fourth-year standing in Veterinary Medicine required.
Prerequisites: VMC 778 with C or better
This course is repeatable for 4 credits.

VMC 714. SMALL ANIMAL DENTISTRY. (1 Credit)
A clinical course designed to provide students with hands-on training in diagnosis, treatment and prophylaxis of dental diseases of dogs and cats.

VMC 715. CASE STUDIES IN SMALL ANIMAL MEDICINE I. (1 Credit)
A case-based course involving diseases and conditions of the endocrine, gastrointestinal and hepatobiliary systems as well as neoplastic and infectious diseases of small animals.

VMC 716. CASE STUDIES IN SMALL ANIMAL MEDICINE II. (1 Credit)
A case-based course involving diseases and conditions of the cardiovascular, respiratory and urogenital systems as well as emergent diseases and conditions.

VMC 717. CASE STUDIES IN SMALL ANIMAL MEDICINE III. (1 Credit)
A case-based course involving diseases and conditions of the dermatologic, neurologic, ophthalmologic, and hemolymphatic systems.

VMC 718. SMALL ANIMAL PREVENTIVE MEDICINE. (2 Credits)
Introductory course to basic concepts in small animal preventive medicine including vaccine immunology, vaccine strategies, internal/external parasite control, nutrition in disease prevention, and wellness programs for dogs and cats.

VMC 719. CLINICAL CARDIOLOGY I. (2 Credits)
Hands-on practical experience in a clinical setting in taking a clinical history, performing a cardiovascular physical examinations, recording electrocardiograms, interpreting thoracic radiographs and echocardiograms, creating problem lists, compiling lists of differential diagnosis, formulating diagnostic and therapeutic plans, discussing treatment options, generating medical records, and discharging patients.

VMC 720. VETERINARY CLINICAL NUTRITION. (2 Credits)
To examine the nutritional needs of many species of veterinary importance. Emphasis is placed on designing feeding programs to optimize health and animal performance.

VMC 721. SMALL ANIMAL CLINICAL NUTRITION. (1 Credit)
Introduction to the concepts of small animal clinical nutrition and is designed for the third-year veterinary student.

VMC 723. ADVANCED FELINE MEDICINE. (2 Credits)
A one-week elective for senior students in the DVM curriculum. The course emphasizes aspects of internal medicine specific to the domestic cat. Graded P/N.

VMC 724. LARGE ANIMAL SURGERY. (6 Credits)
Selected surgical techniques and procedures related to equine and food animal species.
Equivalent to: VM 724

VMC 725. PRINCIPLES OF SURGERY. (4 Credits)
A basic course in the principles and techniques of surgery for the professional veterinary student. Lec/lab.
Equivalent to: VM 725

VMC 726. SMALL ANIMAL THERIOGENOLOGY. (1 Credit)
Advanced clinical experience in small animal (canine) reproduction. Graded P/N.
Prerequisites: VMC 783 with C or better

VMC 727. ADVANCED SMALL ANIMAL SURGERY. (2 Credits)
One-week elective for senior students in the DVM curriculum. The course emphasizes aspects of small animal surgery. Lec/lab. Graded P/N.

VMC 729. CLINICAL THERIOGENOLOGY. (1 Credit)
Practical and theoretical training in reproductive management and disorders in all species; routine diagnostic and treatment procedures; clinic rounds.
This course is repeatable for 3 credits.

VMC 731. SMALL ANIMAL EMERGENCY CARE-DOVE LEWIS. (3 Credits)
A two-week clinical rotation at the Dove Lewis Memorial Emergency Clinic in Portland, OR.
Equivalent to: VM 731

VMC 732. CLINICAL LARGE ANIMAL MEDICINE I. (3,6 Credits)
Clinical medicine training in diseases of food animals and horses; clinic rounds and diagnostic procedures.
Equivalent to: VM 732
This course is repeatable for 24 credits.

VMC 733. LARGE ANIMAL SURGERY LABORATORY. (2 Credits)
Apply surgery principles and common surgical procedures of large animal species.

VMC 734. CLINICAL LARGE ANIMAL SURGERY I. (3,6 Credits)
Clinical surgery; care of food animals and horses; clinical rounds; training in surgery, lameness, and diagnostic procedures. Lec/lab.
Equivalent to: VM 734
This course is repeatable for 24 credits.

VMC 735. RURAL VETERINARY PRACTICE I. (3,6 Credits)
Rural practice training in diseases of food animals and horses. Lec/lab.
Equivalent to: VM 735
This course is repeatable for 6 credits.

VMC 736. CLINICAL SKILLS IV: PROFESSIONAL COMMUNICATION AND ETHICS. (2 Credits)
Develop communication skills and ethical reasoning for client interactions.

VMC 737. VETERINARY ANESTHESIOLOGY. (4 Credits)
A three-week rotation in veterinary anesthesiology utilizing patients presented to the veterinary teaching hospital.
Equivalent to: VM 737
VMC 738. INTRODUCTION TO ANIMAL CARE. (3 Credits)
Feeding, housing, breeding and marketing systems related to animal care.
Equivalent to: VM 738
This course is repeatable for 6 credits.

VMC 739. VETERINARY MEDICAL ETHICS. (1 Credit)
Introduction of ethics in veterinary medicine, with specific attention to ethical theories, ethical decision making, moral status of animals, professional ethics, and practice issues.
Equivalent to: VM 732 with C or better

VMC 740. SHEEP AND GOAT MEDICINE AND SURGERY. (3 Credits)
Discussions of economically important sheep and goat diseases, practical surgeries, and a review of nutrition and husbandry. Graded P/N.

VMC 741. LARGE ANIMAL GI SURGERY. (2 Credits)
A one-week course for 4th year veterinary students, with particular interest in gastrointestinal surgery. Graded P/N.

VMC 742. CAMELID MEDICINE AND SURGERY. (4 Credits)
Designed to give students an in-depth introduction to camelid health care via hands-on work, lectures, and discussion sections. Graded P/N.

VMC 744. ADVANCED LAMENESS IN EQUINE. (3 Credits)
Application of anatomy, lameness examination, nerve and joint anesthesia, diagnostic radiology, ultrasound and nuclear scintigraphy to diagnosis of lameness in horses. Graded P/N.

VMC 745. PRACTICE MANAGEMENT. (2 Credits)
A course in basic personal and business finances, career skills, and legal aspects of veterinary practice. Graded P/N.
Equivalent to: VMB 775

VMC 747. VETERINARY ANESTHESIOLOGY II. (3 Credits)
An additional two-week clinical rotation in veterinary anesthesiology utilizing patients presented to the Veterinary Teaching Hospital. Graded P/N.

VMC 748. EQUINE DENTISTRY. (2 Credits)
Utilizing modern, motorized equipment, cadaver specimens, and live hospital and client horses, students will learn and perform modern methods of equine dental prophylaxis and treatment. Graded P/N.

VMC 749. CLINICAL IMAGING II. (3 Credits)
Advanced clinical course for 4th-year veterinary students in which they will assume additional responsibility for performing common radiographic procedures. Graded P/N.
Prerequisites: VMC 796 with C or better

VMC 750. EQUINE CLINICAL NUTRITION. (1 Credit)
A one-week course for veterinary students focusing on equine nutrition that can be used in veterinary practice. Graded P/N.

VMC 751. RUMINANT NUTRITION. (2 Credits)
An advanced course in clinical ruminant nutrition dealing with nutritional problems of ruminants that might be encountered by a practicing veterinarian. Graded P/N.

VMC 752. CLINICAL LARGE ANIMAL MEDICINE II. (3-6 Credits)
Additional clinical medicine training. Graded P/N.
Prerequisites: VMC 732 with C or better
Equivalent to: VM 752
This course is repeatable for 6 credits.

VMC 753. CLINICAL ONCOLOGY I. (2 Credits)
Teaches students a realistic approach to the diagnosis and treatment of pets with cancer. Students will participate in rounds, case management and medical records keeping.

VMC 754. CLINICAL LARGE ANIMAL SURGERY II. (3,6 Credits)
Additional clinical surgery training. Graded P/N.
Prerequisites: VMC 734 with C or better
Equivalent to: VM 754
This course is repeatable for 6 credits.

VMC 755. RURAL VETERINARY PRACTICE II. (3-6 Credits)
One additional rural practice training. Graded P/N.
Prerequisites: VMC 735 with C or better
Equivalent to: VM 755
This course is repeatable for 6 credits.

VMC 756. CLINICAL SKILLS V: TECHNICAL SKILLS AND CLINICAL REASONING. (1 Credit)
Development of technical and psychomotor skills and clinical reasoning in preparation for clinical coursework.

VMC 758. CATTLE PRODUCTION MEDICINE. (3 Credits)
Clinical application of production medicine practices to dairy and beef cattle practice. Graded P/N.
Prerequisites: VMC 735 with C or better
Equivalent to: VM 758

VMC 759. LARGE ANIMAL PALPATION. (1 Credit)
A laboratory for additional experience in rectal palpation of large animals, for third-year veterinary students. Graded P/N.

VMC 760. CLINICAL SKILLS I: INTRO TO ANIMAL CARE AND VETERINARY MED. (3 Credits)
Introduction of a variety of topics relevant to veterinary clinical skills including professionalism, inclusion, ethics, and career options. In addition, animal care, handling, restraint, and physical exam skills will begin to be developed.

VMC 761. CLINICAL SKILLS II: PHYSICAL EXAM AND PROBLEM SOLVING SKILLS. (3 Credits)
Introduction to problem solving and integration of clinical case and basic science in the veterinary curriculum. Development of physical exam skills on healthy animals and medical records keeping.

VMC 762. CLINICAL SKILLS III: REASONING AND COMMUNICATION. (2 Credits)
Develop communication skills and clinical reasoning in preparation for client interactions and evidence-based decision-making.

VMC 763. ADVANCED CLINICAL CARDIOLOGY. (1 Credit)
An elective course for junior veterinary students detailing diagnosis and management of the common congenital and acquired cardiac diseases of domestic animals.

VMC 764. DIAGNOSTIC IMAGING. (4 Credits)
A lecture and laboratory course in diagnostic imaging covering physics or radiography and ultrasonography, radiation safety and image interpretation for small and large animals, presented by body systems. Equivalent to: VM 764

VMC 765. ADVANCED CLINICAL RADIOLOGY. (1 Credit)
An elective advanced radiology case-based course for Year 3 veterinary medicine students that focuses on radiographic findings of commonly encountered clinical disease.
VMC 766. CLINICAL SMALL ANIMAL ULTRASONOGRAPHY. (2 Credits)
A 1-week overview of clinical small animal ultrasonography with particular emphasis on material relevant to a general or emergency practitioner. Students will be able to perform a FAST scan to identify peritoneal fluid. Students will listen to didactic lectures in the morning with practical sessions in the afternoon. At the end of the week, pairs of students will make a short presentation based on a literature search on a topic of interest.

VMC 767. SMALL ANIMAL ABDOMINAL ULTRASOUND. (3 Credits)
Introductory course to provides instruction in veterinary ultrasound with an emphasis on image optimization, evaluation of the abdomen, description and interpretation of imaging findings in dogs and cats. This course is intended for students with a background in common small animal disease and imaging anatomy.

VMC 768. PRINCIPLES OF ANESTHESIA. (4 Credits)
A basic course in the principles and techniques of surgery and anesthesia for the professional veterinary student. Lec/lab.
Equivalent to: VM 768

VMC 769. GENERAL MEDICINE. (2 Credits)
An introduction to medicine with a discussion of the principles of medicine that would be applicable to all species. Physical examination, clinical diagnosis, pathophysiology of signs of disease in domestic animals, therapeutic principles and diagnostic procedures.
Equivalent to: VM 769

VMC 770. LARGE ANIMAL MEDICINE I. (4 Credits)
The first of three courses in large animal medicine for third-year professional veterinary students covering diagnosis and treatment of domestic large animals.
Equivalent to: VM 770

VMC 771. LARGE ANIMAL MEDICINE II. (4 Credits)
Diagnosis, treatment and control of diseases of large domestic animals, specifically gastrointestinal, hepatobiliary diseases, weight loss, and introduction to production medicine, and some swine diseases.

VMC 772. LARGE ANIMAL MEDICINE III. (4 Credits)
Diagnosis, treatment and control of diseases of large domestic animals, specifically central nervous system, mastitis, musculoskeletal, sudden death, skin, and some swine diseases.

VMC 773. MEDICINE LABORATORY I. (1 Credit)
Laboratory experience for third-year veterinary students concurrent with the large and small animal medicine courses.

VMC 774. MEDICINE LABORATORY II. (1 Credit)
Laboratory experience for third-year veterinary students concurrent with the large and small animal medicine courses.

VMC 775. CLINICAL SMALL SPORTS MEDICINE AND REHABILITATION. (3 Credits)
Clinical training in small animal rehabilitation in the Veterinary Teaching Hospital.

VMC 776. SMALL ANIMAL MEDICINE I. (5 Credits)
A course for veterinary students describing major topics of small animal internal medicine, using both a systems-based approach and a problem-based approach.
Equivalent to: VM 776

VMC 777. SMALL ANIMAL MEDICINE II. (5 Credits)
A course for veterinary students describing major topics of small animal internal medicine, using both a systems-based approach and a problem-based approach.

VMC 778. SMALL ANIMAL MEDICINE III. (5 Credits)
A course for veterinary students describing major topics of small animal internal medicine, using both a systems-based approach and a problem-based approach.

VMC 779. EQUINE SPORTS MEDICINE. (1 Credit)
One-week elective encompassing basic exercise physiology, sports-related injuries, injury rehabilitation, training and nutrition of equine athletes. Graded P/N.
Equivalent to: VM 779

VMC 780. VETERINARY MEDICAL PRECEPTORSHIP. (1-16 Credits)
Theory of practice of veterinary medicine in a non-university situation. Graded P/N.
Equivalent to: VM 780
This course is repeatable for 16 credits.

VMC 781. SEMINAR IN VETERINARY MEDICINE. (1-16 Credits)
Seminars and case discussions on selected topics by students, staff, and others. Graded P/N.
Equivalent to: VM 781
This course is repeatable for 16 credits.

VMC 782. EMERGENCY CARE. (1 Credit)
One-week rotation in the Veterinary Teaching Hospital during non-regular hours. Practice and instruction in caring for critically ill patients.
Equivalent to: VM 782

VMC 783. THERIOGENOLOGY I. (4 Credits)
To present the clinical applications of reproductive physiology, anatomy, embryology, pathology and microbiology in domesticated animals.
Equivalent to: VM 783

VMC 785. SMALL ANIMAL SURGERY. (7 Credits)
A course for veterinary students describing major topics of small animal surgery.
Equivalent to: VM 785

VMC 786. ANIMAL BEHAVIOR. (1 Credit)
Diagnosis and treatment of feline, canine and equine problem behaviors including aggression, anxiety, house-soiling and compulsive behaviors.

VMC 787. 3RD YEAR CLINICS. (1 Credit)
An introductory clinical experience for third-year veterinary students.

VMC 788. BUSINESS APPLICATIONS IN PRIVATE SMALL ANIMAL PRACTICE. (1 Credit)
A hands-on elective course exploring the business of small animal general practice in a case-based approach.
This course is repeatable for 2 credits.

VMC 789. PET PRACTICE. (3 Credits)
Additional clinical training in primary care pet practice at a Banfield Pet Hospital. Graded P/N.
This course is repeatable for 6 credits.

VMC 790. CLINICAL EXPERIENCE. (1-16 Credits)
Equivalent to: VM 790
This course is repeatable for 48 credits.
VRE 791. CLINICAL SMALL ANIMAL MEDICINE. (3,6 Credits)
A clinical rotation in small animal internal medicine at the Veterinary Teaching Hospital. Emphasis will be placed on patient evaluation, diagnosis and treatment of diseases of dogs and cats.
This course is repeatable for 6 credits.

VRE 792. CLINICAL SMALL ANIMAL MEDICINE II. (3-6 Credits)
A two-week, three-credit clinical elective rotation in small animal internal medicine at the Veterinary Teaching Hospital. Emphasis will be placed on patient evaluation, diagnosis and treatment of diseases of dogs and cats.
This course is repeatable for 6 credits.

VRE 793. CLINICAL SMALL ANIMAL SURGERY. (3,6 Credits)
Clinical training in small animal surgery in the Veterinary Teaching Hospital.
Prerequisites: VRE 725 with C or better and VRE 785 [C]
This course is repeatable for 6 credits.

VRE 794. OHS SMALL ANIMAL PRIMARY CARE. (4 Credits)
Three-week rotation at OHS to gain experience with an emphasis on surgery, medical case workup, exam room protocol and behavior basics.

VRE 796. CLINICAL IMAGING. (3 Credits)
A clinical course for 4th-year veterinary students in which they will assume primary responsibility for performing common radiographic procedures.

VRE 797. SMALL ANIMAL CRITICAL CARE AND HOSPITAL SERVICE
ROTATION. (1 Credit)
A one-week clinical rotation in small animal critical care managing small animal cases in the intensive care unit at the Veterinary Teaching Hospital.

VRE 798. CLINICAL SMALL ANIMAL SURGERY II. (3-6 Credits)
Clinical training in small animal surgery in the College of Veterinary Medicine, Lois B. Acheson Veterinary Teaching Hospital.
This course is repeatable for 6 credits.

VRE 799. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

Water Resources Engineering (WRE)

WRE 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRE 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 509. PRACTICUM. (1-16 Credits)
This non-traditional class explores tools, models and concepts in the collaborative decision-making process in water resources. Emphasis is on group projects and self-directed practical application of community-based natural resources.
This course is repeatable for 16 credits.

WRE 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRE 517. WRITING IN WATER RESOURCES. (4 Credits)
An intensive summer course to develop proficiency in writing at a graduate level for the wide range of writing tasks common to water resource professionals. Students will complete individual in-class writing assignments and collaborate on a draft of a technical report. While it is designed for students in the Water Cooperation and Peace joint degree program (many of whom will be international students) the course will also be useful for other students. Lec/rec.

WRE 521. WATER CONFLICT MANAGEMENT AND TRANSFORMATION. (3
Credits)
Examines ways to work effectively in contentious water situations. Explores conflict tolerance, prevention, management, and transformation through collaborative structures as well as through models of negotiation and dialogue.

WRE 523. ENVIRONMENTAL WATER TRANSACTIONS. (3 Credits)
Covers the theory and practice of using water rights transactions to reallocate water rights to environmental purposes. Different transactional techniques and contexts appropriate to their use are presented through case studies primarily from the western United States, with some reference to the use transactions in other countries such as Australia.

Water Resources Policy and Mgt (WRP)

WRP 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRP 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 509. PRACTICUM. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 511. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 517. WRITING IN WATER RESOURCES. (4 Credits)
An intensive summer course to develop proficiency in writing at a graduate level for the wide range of writing tasks common to water resource professionals. Students will complete individual in-class writing assignments and collaborate on a draft of a technical report. While it is designed for students in the Water Cooperation and Peace joint degree program (many of whom will be international students) the course will also be useful for other students. Lec/rec.

WRP 521. WATER CONFLICT MANAGEMENT AND TRANSFORMATION. (3
Credits)
Examines ways to work effectively in contentious water situations. Explores conflict tolerance, prevention, management, and transformation through collaborative structures as well as through models of negotiation and dialogue.

WRP 523. ENVIRONMENTAL WATER TRANSACTIONS. (3 Credits)
Covers the theory and practice of using water rights transactions to reallocate water rights to environmental purposes. Different transactional techniques and contexts appropriate to their use are presented through case studies primarily from the western United States, with some reference to the use transactions in other countries such as Australia.
WRS 524. SOCIOTECHNOLOGICAL ASPECTS OF WATER RESOURCES. (3 Credits)
Core curriculum, graduate-level course in the Water Resources Graduate Program focusing on an interdisciplinary approach to water resources research that integrates the human and the technological dimensions of water resource issues. It is comprised of lecture and discussion sessions with guest lectures by visiting seminar speakers.

WRS 544. MANAGING NATURAL RESOURCES FOR CLIMATE ADAPTATION. (3 Credits)
Students will work through series of case studies in resource management to identify strategies and approaches that promote or prevent resilience in resource management. Students participate in discussions and hands-on activities in addition to the lectures and will prepare daily reflections, a final reflection and a final essay due one week after the end of the classroom sessions. This course will use a lecture and discussion format, and draw from the international expertise of the instructor and guest lecturers.

WRS 548. CONDUCTING COLLABORATIVE PROJECTS. (3 Credits)
Focuses on development of the abilities needed to complete a directed water-related collaborative project, delivered through experiential learning. The course specifically addresses development of collaborative skills needed to work in interdisciplinary teams. The course activities are centered around a collaborative project on which students will be conducting research, collecting data synthesizing information; and providing classmates with constructive peer-review. Lec/rec.

WRS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

WRP 808. WORKSHOP. (1-4 Credits)
Examines ways to work effectively in contentious water situations. Explores conflict tolerance, prevention, management, and transformation through collaborative structures as well as through models of negotiation and dialogue. This course is repeatable for 4 credits.

**Water Resources Science (WRS)**

WRS 501. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRS 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 510. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 532. APPLIED FIELD PROBLEMS. (3 Credits)
Introduces graduate students to real-world water resources problems and approaches to solving them. Students will assess and analyze the various constraints and limitations to integrated water management that often cannot be adequately simulated in classroom exercises. They will acquire the practical tools necessary to become effective water resources professionals in a rapidly changing world.

WRS 536. FUNDAMENTALS OF HYDROLOGY. (3 Credits)
Teaches students from a non-technical background in the Water Cooperation and Peace program the fundamentals of hydrology. Students will be introduced to hydrology and the hydrological cycle at the graduate level with a focus on key concepts. Students will apply these concepts to understanding of real world problems in the associated course, WRS 532, Applied Field Problems. Lec/lab.

WRS 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 601. RESEARCH. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 603. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WRS 605. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 606. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 607. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 608. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 610. INTERNSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WRS 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

**Women, Gender, and Sexuality (WGSS)**

WGSS 110. *GENDER, RACE, AND POP CULTURE. (3 Credits)
Introduces students to the critical analysis of mass media and representations of women, gender, sexuality, and race in popular culture. Topics vary from term to term and may include the entertainment industry, advertising, music, literature, the internet and technology. May be repeated for credit when topic varies. (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
This course is repeatable for 9 credits.

WGSS 111. *FEMINIST PERSPECTIVES ON CURRENT EVENTS. (3 Credits)
Introduction to feminist analysis through the examination of current events and their relation to gender, sexuality, race, ethnicity, nationality, religion, class, age, and ability. Topics vary from term to term and may include issues related to politics, social movements, education, the workplace, science and technology, the environment, globalization, arts and culture, and the media. May be repeated for credit when topic varies. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
This course is repeatable for 9 credits.

WGSS 199. SPECIAL STUDIES. (1-3 Credits)
Special topics of contemporary relevance to research of women and gender role issues. For students who seek an elementary introduction to a specific realm of women, gender, and sexuality studies. May be repeated for credit when topic varies.
Equivalent to: WS 199
This course is repeatable for 9 credits.
WGSS 223. *INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES. (3 Credits)
Multidisciplinary introduction to women, gender, and sexuality studies. Focuses on the lives and status of women in society and explores ways institutions such as family, work, media, law and religion affect different groups of women. Explores issues of gender, race, class, age, sexual orientation, size and ability. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WGSS 223H, WS 223, WS 223H

WGSS 223H. *INTRODUCTION TO WOMEN, GENDER, AND SEXUALITY STUDIES. (3 Credits)
Multidisciplinary introduction to women, gender, and sexuality studies. Focuses on the lives and status of women in society and explores ways institutions such as family, work, media, law and religion affect different groups of women. Explores issues of gender, race, class, age, sexual orientation, size and ability. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 224

WGSS 224. *WOMEN: PERSONAL AND SOCIAL CHANGE. (3 Credits)
Examines the way the questioning of traditional gender roles and their accompanying power structures can lead to change in women's personal and public lives. Explores women's heritage and contributions and focuses on issues of self-growth and social movements for change. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 224

WGSS 230. *WOMEN IN THE MOVIES. (3 Credits)
Examines ways women are depicted in the movies and how those depictions are created by and create larger social constructions of women. Special attention is given to the intersections of race, class, sexual identity, and age with gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 230

WGSS 230H. *WOMEN IN THE MOVIES. (3 Credits)
Examines ways women are depicted in the movies and how those depictions are created by and create larger social constructions of women. Special attention is given to the intersections of race, class, sexual identity, and age with gender. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 235

WGSS 235. *WOMEN IN WORLD CINEMA. (3 Credits)
Explores constructions and practices of gender in a transnational, multi-religious, and global framework by examining a wide variety of films about women around the world. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: WS 235H

WGSS 235H. *WOMEN IN WORLD CINEMA. (3 Credits)
Explores constructions and practices of gender in a transnational, multi-religious, and global framework by examining a wide variety of films about women around the world. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: WS 235, WS 235H

WGSS 240. *GENDER AND SPORT. (3 Credits)
Focuses on sport as a gendered institution. Drawing from cultural, psychosocial, and political perspectives, the course examines intersections of gender with age, sexual orientation, social class, gender identity, race and ethnicity and politics. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WS 240H, WS 240

WGSS 240H. *GENDER AND SPORT. (3 Credits)
Focuses on sport as a gendered institution. Drawing from cultural, psychosocial, and political perspectives, the course examines intersections of gender with age, sexual orientation, social class, gender identity, race and ethnicity and politics. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WS 240

WGSS 262. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia's and transphobia's relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as WS 262, WS 262H.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 262, QS 262H

WGSS 262H. *INTRODUCTION TO QUEER STUDIES. (3 Credits)
Centering itself on activism and scholarship, this course examines homophobia's and transphobia's relationship with racism, colonialism, sexism, ableism, classism and other forms of oppression. Introduces key concepts, histories, and political frameworks within Lesbian, Gay, Bisexual, Transgender, and Queer political movements. CROSSLISTED as WS 262, WS 262H.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; HNRS – Honors Course Designator
Equivalent to: WS 262, QS 262H

WGSS 270. *RESISTING GENDER VIOLENCE. (3 Credits)
Addresses issues of domestic violence, rape, dating violence, as well as contemporary social debates about pornography and the media's impact on violence in society, which includes a global perspective. Course focuses on individual and collective practices resisting gender violence. (Bacc Core Course) (SS)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst; LACS – Liberal Arts Social Core
Equivalent to: WS 270

WGSS 280. *WOMEN WORLDWIDE. (3 Credits)
Focuses on women's experiences throughout the world and examines women's issues and status cross-culturally. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: WS 280H, WS 280

WGSS 280H. *WOMEN WORLDWIDE. (3 Credits)
Focuses on women's experiences throughout the world and examines women's issues and status cross-culturally. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: WS 280, WS 280H
WGSS 295. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: ENG 295, ENG 295H, PHL 295, PHL 295H, WGSS 295H
WGSS 295H. *FEMINISM AND THE BIBLE. (3 Credits)
Examines feminist interpretations of the Bible and pays special attention to intersections of race, social class, sexual identity, and nation in biblical interpretation. CROSSLISTED as ENG 295/PHL 295/WGSS 295. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: ENG 295, ENG 295H, PHL 295, PHL 295H, WGSS 295H
WGSS 299. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics related to women, gender and sexuality. Description and analysis of different realms of knowledge about gender issues.
Equivalent to: WS 299
This course is repeatable for 12 credits.

WGSS 311. *GLOBAL EXPERIENCE: CULTURAL DIVERSITY. (3 Credits)
Engagement in a study abroad experience outside Western Europe with an emphasis on transnational, queer, and critical race feminist analysis (minimum of 7 days). (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
This course is repeatable for 12 credits.
WGSS 312. *GLOBAL EXPERIENCE: WESTERN CULTURE. (3 Credits)
Engagement in a study abroad experience in Western Europe with an emphasis on transnational, queer, and critical race feminist analysis (minimum of 7 days). (Bacc Core Course)
Attributes: CPWC – Core, Pers, West Culture
This course is repeatable for 12 credits.
WGSS 313. *GLOB EXPER: CONTEMP GLOB ISSU. (3 Credits)
Engagement in a study abroad experience with an emphasis on transnational, queer, and critical race feminist analysis of critical global issues (minimum of 7 days).
Attributes: CSSI – Core, Synth, Global Issues
This course is repeatable for 12 credits.
WGSS 319. *FEMINIST DECOLONIZING METHODOLOGIES: SOCIAL JUSTICE RESEARCH. (3 Credits)
Examines traditional scientific methods through a feminist philosophy of science lens that incorporates critiques of the racialized and gendered origins of modern science. Second, it introduces the breadth of feminist research methods associated with social justice research.
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Prerequisites: WGSS 223 with D- or better or WGSS 223H with D- or better
WGSS 320. *GENDER AND TECHNOLOGY. (3 Credits)
Explores women's contributions and focuses in technology fields. Analyzes gendered nature of technology. Theory and practice of technologies. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: WS 320

WGSS 321. *QUEER POP CULTURE. (3 Credits)
Examines the concept of queer popular culture through film, music, TV, image, and other mediums. Seeks to disrupt dominant discourses around gender and sexuality by centralizing women of color feminisms and queer of color critiques to analyze popular representations of gender, sexuality, race, class, disability, and other social locations. CROSSLISTED as QS 321/WGSS 321. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WS 325

WGSS 324. *FEMINIST ACTIVISMS. (3 Credits)
Addresses the breadth of feminist social justice activism through a focus on collective movements for social change as well as individual and community resistance. In exploring relationships between feminist theories and practice, students are encouraged to vision and practice a variety of feminist activisms. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst

WGSS 325. *DISNEY: GENDER, RACE, EMPIRE. (3 Credits)
Explores constructions of gender, race, class, sexuality, and nation in the animated films of Walt Disney; introduces concepts in film theory and criticism, and develops analyses of the politics of representation. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: WS 325

WGSS 340. *GENDER AND SCIENCE. (3 Credits)
Analyzes the relationship between society and science by explaining technology and science as gendered practices and bodies of knowledge. Focuses on the ways the making of women and men affect the making of science and explores the roles of women in scientific pursuits. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; LACS – Liberal Arts Social Core
Equivalent to: WS 340

WGSS 340H. *GENDER AND SCIENCE. (3 Credits)
Analyzes the relationship between society and science by explaining technology and science as gendered practices and bodies of knowledge. Focuses on the ways the making of women and men affect the making of science and explores the roles of women in scientific pursuits. (SS) (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator; LACS – Liberal Arts Social Core
Equivalent to: WS 340
WGSS 350. *POLITICS OF MOTHERHOOD IN A GLOBAL CONTEXT. (3 Credits)
Introduces students to the politics of motherhood in global contexts, focusing on politics of transnational adoption; motherhood, surrogacy, and biotechnologies; effects of globalization on mothering across borders; mothering in the global welfare state; movements for reproductive justice; and transnational representations of motherhood. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WS 350

WGSS 360. *MEN AND MASCULINITIES IN A GLOBAL CONTEXT. (3 Credits)
Students will become familiar with central topics in global masculinity studies, analyze texts in diverse media, develop original arguments, and engage with issues of masculinity and representation through written and creative work. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WS 360

WGSS 360H. *MEN AND MASCULINITIES. (3 Credits)
Students will become familiar with central topics in global masculinity studies, analyze texts in diverse media, develop original arguments, and engage with issues of masculinity and representation through written and creative work. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WS 360, WS 360

WGSS 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSLISTED as ES 361/QS 361/WGSS 361/WLC 361.
Equivalent to: ES 361, QS 361, WLC 361
Recommended: Prior filmmaking experience

WGSS 362. *SERVING LGBTQ+ COMMUNITIES. (3 Credits)
Engages the ethics and responsibilities involved in serving LGBTQ+ communities in fields such as education, health, law, and social services for those entering and/or continuing professions in fields that historically underserve LGBTQ+ people. Topics include LGBTQ+ youth; LGBTQ+ elders; issues affecting LGBTQ+ people across their lifespans; approaches to cultural competency; violence against LGBTQ+ people; forms of oppression including heterosexism, homophobia, and transphobia; and LGBTQ+ community resilience. CROSSLISTED as QS 362/WGSS 362. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst
Equivalent to: QS 362

WGSS 364. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 364, QS 364H, WGSS 364H

WGSS 364H. *TRANSGENDER POLITICS. (3 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 364/WGSS 364. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator
Equivalent to: QS 364, QS 364H, WGSS 364

WGSS 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ANTH 373, ES 373, WLC 373

WGSS 375. *ARTS AND SOCIAL JUSTICE. (4 Credits)
Explores concepts of structural inequality, difference, power, and discrimination through a critical survey of arts activism. Think critically about artwork and artists which address a number of social issues in the United States, including race, ethnicity, class, gender, sexuality, immigration, and indigeneity. CROSSLISTED as ES 375/QS 375/WGSS 375.
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 375, QS 375

WGSS 378. *RELIGION AND GENDER: A GLOBAL PERSPECTIVE. (4 Credits)
Introduces students to the academic study of religion, as well as the academic study of gender. In order to offer a global perspective, we will read a series of case studies that deal with the religion as a gendered experience. Students will produce two essays, one of which will be based on independent research. CROSSLISTED as HST 378/REL 378/WGSS 378. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: HST 378, REL 378

WGSS 380. *MUSLIM WOMEN. (3 Credits)
Examines the lives and experiences of Muslim women in Islamic communities around the world from a variety of perspectives in order to highlight issues significant for contemporary Muslim women: family, education, work, politics, health, marriage, divorce, war, and violence. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WGSS 380H

WGSS 389. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics in women, gender, and sexuality. May be repeated for credit when topic varies.
Equivalent to: WGSS 389H, WS 399
This course is repeatable for 12 credits.

WGSS 399H. TOPICS IN WOMEN, GENDER, AND SEXUALITY STUDIES. (1-6 Credits)
Current topics in women, gender, and sexuality. May be repeated for credit when topic varies.
Attributes: HNRS – Honors Course Designator
Equivalent to: WGSS 399, WS 399, WS 399H
This course is repeatable for 12 credits.

WGSS 402. INDEPENDENT STUDY. (1-16 Credits)
Equivalent to: WS 402
This course is repeatable for 16 credits.
WGSS 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WGSS 407. SEMINAR. (3 Credits)
Equivalent to: WS 407
This course is repeatable for 99 credits.

WGSS 409. PRACTICUM. (1-12 Credits)
This course is repeatable for 12 credits.

WGSS 410. INTERNSHIP. (1-16 Credits)
The internship experience provides the opportunity to gain experience within an off-campus private, public, or community agency or organization which has as one of its goals the improvement of the status of women in society. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the WGSS program. Only 6 credits will count toward the Women, Gender, and Sexuality Studies major.
Equivalent to: WS 410
This course is repeatable for 16 credits.

WGSS 414. *SYSTEMS OF OPPRESSION IN WOMEN’S LIVES. (4 Credits)
Explores the ways different systems of oppression and discrimination impact women’s lives. Examines sexism, classism, racism, and anti-Jewish oppression, as well as discrimination against queer women, older women, and those who differ in ability and appearance. (SS) (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; LACS – Liberal Arts Social Core
Prerequisites: WS 223 with D- or better or WS 223H with D- or better
Equivalent to: WS 416

WGSS 416. THEORIES OF FEMINISM. (4 Credits)
Explores feminist conceptions about the nature of the world, women’s reality and visions for change. Analyzes major issues raised by the women’s movement and the development of feminist ideas, as well as provides a critical examination of feminist thought and different theories which comprise it.
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WS 224H with D- or better or WS 224 with D- or better or WS 224H with D- or better
Equivalent to: WS 416

WGSS 417. FEMINIST PHILOSOPHIES. (3 Credits)
Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class, with in-depth consideration of selected social issues such as rape and pornography. CROSSLISTED as PHL 417/WGSS 417 and PHL 517/WGSS 517.
Equivalent to: PHL 417, WS 417

WGSS 418. FEMINIST RESEARCH METHODS. (4 Credits)
Introduces feminist research methods associated with research design, analysis, and interpretation. It utilizes feminist social justice frameworks and focuses on in-depth interviewing and focus groups, oral histories, ethnography, and visual and textual analysis, as well as survey design and community-based participatory research.
Prerequisites: WGSS 414 with C- or better

WGSS 430. WOMEN OF COLOR FEMINISMS. (4 Credits)
Explores the contemporary experiences of women of color, as well as the theoretical and practical frameworks of women of color feminisms. Analyses key themes in women of color feminisms, including politics of representation, multiple forms of state and interpersonal violence, intersecting forms of oppression, economic justice, reproductive justice, and strategies of resistance.
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WGSS 223 with D- or better or WGSS 223H with D- or better
Equivalent to: WS 430

WGSS 431. *QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ES 431, QS 431

WGSS 432. *GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/QS 532/WGSS 532. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: ART 432, QS 432

WGSS 440. *WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women’s use and control of natural resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society
Equivalent to: WGSS 440H, WS 440

WGSS 440H. *WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women’s use and control of natural resources. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society; HNRS – Honors Course Designator
Equivalent to: WGSS 440

WGSS 450. ECOFEMINISM. (3 Credits)
Focuses on the ecological and feminist principles that mediate humanity’s relationship with nature.
Equivalent to: WS 450
WGSS 460. *SEXUALITIES, FEMINISMS, WOMEN. (4 Credits)
Explores the historical, theoretical, and political dimensions of female sexuality. The course also examines the basic assumptions about the meaning of gendered sexuality, how it has been shaped and controlled, and why women's sexuality has been/is a source of both women's liberation and subjugation. In addition, the course incorporates Queer and Trans* theories about gendered/women's sexualities. (SS) (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC; LACS – Liberal Arts Social Core
Prerequisites: WGSS 223 with D- or better or WGSS 223H with D- or better or WGSS 224 with D- or better
Equivalent to: WS 460

WGSS 462. *QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSLISTED as QS 462/WGSS 462 and QS 562/WGSS 562. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: QS 462, WS 462

WGSS 463. *GLOBAL SEX WORK AND TRAFFICKING. (3 Credits)
Examination of sex work and trafficking, cross culturally drawing upon case studies from Africa, Asia, the Americas, and Europe. It explores legal and regulatory debates, diversity of sex work-related experiences, and sex work-related social activism to uncover the gendered intersections of power and privilege from a global perspective. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: WGSS 223 with D- or better or WS 223 with D- or better or WGSS 224 with D- or better or WS 224 with D- or better

WGSS 465. WOMEN, WEIGHT, AND BODY IMAGE. (4 Credits)
Focuses on women's increasing struggles with weight, eating disorders, and broader body image issues in contemporary society. Explores how social institutions such as media, medicine, government contribute to weight bias and unhealthy standards for appearance. Examines weightism as a system of oppression that intersects with other systems of oppression including sexism, racism, classism, heterosexism, ableism, and ageism. CROSSLISTED as PSY 465/WGSS 465 and PSY 565.
Equivalent to: PSY 462, PSY 465

WGSS 466. *FAT STUDIES. (4 Credits)
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employs a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566. (Bacc Core Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WS 224H with D- or better or WS 240 with D- or better or WS 262 with D- or better or WS 262H with D- or better or WS 270 with D- or better or WS 280 with D- or better or WS 280H with D- or better or WS 321 with D- or better or WS 325 with D- or better or WS 325H with D- or better or WS 340 with D- or better or WS 340H with D- or better or WS 350 with D- or better or WS 360 with D- or better or WS 360H with D- or better or WS 364 with D- or better or WS 364H with D- or better or WS 373 with D- or better or WS 375 with D- or better or WS 380 with D- or better or WS 380H with D- or better
Equivalent to: PSY 466, WS 466

WGSS 472. *INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits)
Attributes: CWIC – Core, Skills, WIC
Equivalent to: ES 472, QS 472
Recommended: QS 262 or ES 242 or WGSS 414

WGSS 473. TRANSGENDER LIVES. (4 Credits)
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSLISTED as QS 473/WGSS 473 and QS 573/WGSS 573.
Equivalent to: QS 473
Recommended: WGSS/QS 262, WGSS/QS 364

WGSS 476. *TRANSNATIONAL SEXUALITIES. (4 Credits)
Explores contemporary experiences of sexualities within transnational contexts. Analyzes themes including queer and LGBTIQ organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSLISTED as QS 476/WGSS 476 and QS 576/WGSS 576. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Prerequisites: QS 262 with D- or better
Equivalent to: QS 476
WGSS 477. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits)
LGBTQ people of color often engage struggles for social justice through artistic movements. Focuses on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSLISTED as ES 477/QS 477/ WGSS 477 and ES 577/QS 577/WGSS 577.
Equivalent to: ES 477, QS 477
Recommended: QS 262 and QS 464

WGSS 480. *GENDER AND TRANSNATIONAL ACTIVISMS. (3 Credits)
Focuses on social constructions of gender in global context. It explores the comparative realities of various gendered struggles for social justice and studies key definitions and theoretical assumptions relevant to the subject of global feminist activism. (NC) (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; LACN – Liberal Arts Non-Western Core
Prerequisites: WGSS 223 with D- or better or WGSS 223H with D- or better or WGSS 224 with D- or better
Equivalent to: WGSS 480H, WS 480

WGSS 480H. *GENDER AND TRANSNATIONAL ACTIVISMS. (3 Credits)
Focuses on social constructions of gender in global context. It explores the comparative realities of various gendered struggles for social justice and studies key definitions and theoretical assumptions relevant to the subject of global feminist activism. (NC) (Bacc Core Course)
Attributes: CPDC – Core, Pers, Cult Diversity; CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator; LACN – Liberal Arts Non-Western Core
Prerequisites: WS 223 with D- or better or WS 223H with D- or better or WS 224 with D- or better or WGSS 223 with D- or better or WGSS 223H with D- or better or WGSS 224 with D- or better
Equivalent to: WGSS 480

WGSS 482. GLOBAL PERSPECTIVES ON WOMEN’S HEALTH. (4 Credits)
Women’s health issues are examined from a global perspective in the context of a woman’s life and through a feminist political lens. Central to our discussions will be an analysis of the interplay among race, class, and gender in shaping particular health care outcomes. The course stresses the potential for women’s agency and autonomy with respect to improving their health and environments.
Equivalent to: WS 482

WGSS 483. RACE, GENDER, AND HEALTH JUSTICE. (4 Credits)
Based on a social justice framework, this course explores the intersections of race, gender, ethnicity, disability and sexuality to provide a deeper understanding of how these factors shape health inequities in diverse communities nationally and globally.
Equivalent to: WS 483

WGSS 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D-] or ES 410 [D-] or WGSS 410 [D-] or WLC 410 [D-])
Equivalent to: ANTH 485, ES 485, WLC 485
This course is repeatable for 4 credits.

WGSS 486. GLOBAL EXPERIENCE I. (1 Credit)
Prepares students to participate in a short-term study abroad experience that emphasizes volunteer experiences in women’s organizations and analysis from transnational feminist perspectives.
Equivalent to: WS 486

WGSS 487. GLOBAL EXPERIENCE II. (1 Credit)
Engages students in a short-term study abroad experience that emphasizes volunteer experiences in women’s organizations and analysis from transnational feminist perspectives.
Prerequisites: WS 486 with D- or better or WS 586 with D- or better or WGSS 486 with D- or better or WGSS 586 with D- or better
Equivalent to: WS 487

WGSS 488. GLOBAL EXPERIENCE III. (1 Credit)
Students reflect on their short-term study abroad experience by engaging in in-depth transnational feminist analysis of particular aspects of the study abroad experience.
Prerequisites: WS 486 with D- or better or WS 487 with D- or better or WGSS 486 with D- or better or WGSS 487 with D- or better
Equivalent to: WS 488

WGSS 490. SELF-ESTEEM AND PERSONAL POWER. (3 Credits)
Explores ways to improve self-esteem and develop personal power. Focuses on issues of self and identity, contextualizing these in the ways gender is constructed in society. (SS)
Attributes: LACS – Liberal Arts Social Core
Equivalent to: WS 490

WGSS 495. *GLOBAL FEMINIST THEOLOGIES. (4 Credits)
Explores the connections between women’s religious experiences around the world and the global problems addressed by feminist theology and spirituality. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: WGSS 495H, WS 495
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224 and junior standing.

WGSS 495H. *GLOBAL FEMINIST THEOLOGIES. (3 Credits)
Explores the connections between women’s religious experiences around the world and the global problems addressed by feminist theology and spirituality. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues; HNRS – Honors Course Designator
Equivalent to: WS 495, WS 495

WGSS 496. *FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences. (Bacc Core Course)
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination
Equivalent to: WGSS 496H, WS 496, WS 496H
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224 and junior standing.
**WGSS 496H. *FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)**  
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences. (Bacc Core Course)  
Attributes: CPDP – Core, Perspective, Difference/Power/Discrimination; HNRS – Honors Course Designator  
Equivalent to: WGSS 495, WS 496, WS 496H  
Recommended: (WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224) and junior standing

**WGSS 498. FEMINIST PRACTICE. (4 Credits)**  
For graduating seniors in women, gender, and sexuality studies. Building on knowledge and experiences acquired in required and elective women, gender, and sexuality studies courses, it focuses on central questions for feminist research and activism. In particular, the course helps students develop deeper understandings of the process of generating feminist knowledge and its application in diverse forms of feminist practice.  
Prerequisites: WGSS 414 with D- or better and WGSS 416 [D+]  
Equivalent to: WS 498

**WGSS 499. TOPICS. (1-6 Credits)**  
Topics on contemporary research in women, gender, and sexuality studies. May be repeated for credit when topic varies.  
Equivalent to: WS 499  
This course is repeatable for 12 credits.

**WGSS 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)**  
Equivalent to: WS 501  
This course is repeatable for 16 credits.

**WGSS 502. INDEPENDENT STUDY. (1-16 Credits)**  
Equivalent to: WS 502  
This course is repeatable for 16 credits.

**WGSS 503. THESIS. (1-16 Credits)**  
Equivalent to: WS 503  
This course is repeatable for 999 credits.

**WGSS 506. PROJECTS. (1-16 Credits)**  
Equivalent to: WS 506  
This course is repeatable for 16 credits.

**WGSS 510. INTERNSHIP. (1-16 Credits)**  
The internship experience provides the opportunity to gain experience within an off-campus private, public, or community agency or organization which has as one of its goals the improvement of the status of women in society. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the Women, Gender, and Sexuality Studies program.  
Equivalent to: WS 510  
This course is repeatable for 16 credits.

**WGSS 511. ORIENTATION AND PROFESSIONALIZATION I. (1 Credit)**  
The WGSS 511, 512, 513 sequence prepares Women, Gender, and Sexuality Studies graduate students to succeed in their courses of study and in their chosen profession. WGSS 511 provides knowledge about Women, Gender, and Sexuality Studies as a discipline and as a course of study that helps students manage the transition to graduate school. Graded P/N.  
Equivalent to: GRAD 511, WS 511

**WGSS 512. ORIENTATION AND PROFESSIONALIZATION II. (1 Credit)**  
The WGSS 511, 512, 513 sequence prepares Women, Gender, and Sexuality Studies graduate students to succeed in their courses of study and in their chosen profession. WGSS 512 guides students in the development of an intellectual life with a focus on thriving and surviving as a scholar in Women, Gender, and Sexuality Studies. Graded P/N.  
Equivalent to: GRAD 511, WS 512

**WGSS 513. ORIENTATION AND PROFESSIONALIZATION III. (1 Credit)**  
The WGSS 511, 512, 513 sequence prepares Women, Gender, and Sexuality Studies graduate students to succeed in their courses of study and in their chosen profession. WGSS 513 focuses on helping students shape a future that utilizes the graduate degree in Women, Gender, and Sexuality Studies. It helps students manage the transition to life after the Women, Gender, and Sexuality Studies Master’s program at OSU. Graded P/N.  
Equivalent to: GRAD 511, WS 513

**WGSS 514. SYSTEMS OF OPPRESSION: STRATEGIES FOR RESISTANCE. (4 Credits)**  
Explores the ways different systems of oppression function in society. Applies feminist intersectionality approaches to examine interlocking systems of inequality and privilege.  
Equivalent to: WS 514

**WGSS 515. ADVANCED RESEARCH LITERATURE REVIEW. (3 Credits)**  
Provides graduate students with knowledge and experience in the advanced literature review process including construction of the literature review as product. One of the primary skills graduate students must master is advanced review of a body of literature for the research project. Mastery of the literature review process influences quality and sophistication of claims developed to justify research, with the written review clearly delineating the unique contribution of the student’s research and the knowledge gap that it fills. The literature review as a product is a strong written argument that builds a case from credible evidence based on previous research. CROSSLISTED as ANTH 515/ CSSA 515/ES 515/WGSS 515.  
Equivalent to: ANTH 515, CSSA 515, ES 515

**WGSS 516. THEORIES OF FEMINISM. (4 Credits)**  
Explores feminist conceptions about the nature of the world, women's reality and visions for change. Analyzes major issues raised by the women's movement and the development of feminist ideas, as well as provides a critical examination of feminist thought and different theories which comprise it.  
Equivalent to: WS 516  
Recommended: WS 223 or WS 223H or WS 224 or WGSS 223 or WGSS 223H or WGSS 224

**WGSS 517. FEMINIST PHILOSOPHIES. (3 Credits)**  
Diverse forms of feminist philosophy, including a variety of critiques, especially those based on race and class, with in-depth consideration of selected social issues such as rape and pornography. CROSSLISTED as PHL 417/WGSS 417 and PHL 517/WGSS 517.  
Equivalent to: PHL 517, WS 517  
Recommended: 6 credits of philosophy

**WGSS 518. FEMINIST RESEARCH. (4 Credits)**  
Explores the socio-political and historical context out of which traditional research methodologies emerge and the relationship of gender to scientific pursuits. Teaches what it means to do emancipatory anti-sexist and participatory research.  
Equivalent to: WS 518
WGSS 521. FEMINIST LEADERSHIP. (4 Credits)
Examines theories of feminist leadership and applications in non-profit, governmental, and higher education institutions.
Equivalent to: WS 521

WGSS 522. GRANT AND FUND DEVELOPMENT FOR FEMINIST ORGANIZATIONS. (4 Credits)
Provides students with the skills needed to be successful in grant-writing and fundraising for feminist organizations. Students will address the politics of grant writing and fund raising in relation to the feminist movement’s aims and goals. They will also work directly with agencies to understand the trade-offs and value/need of securing funding for social change organizations.
Equivalent to: WS 522

WGSS 523. COMMUNITY ORGANIZING AND COLLECTIVE ACTION. (2 Credits)
Addresses relationships between theory and action in feminist context. Explores both social change activism in terms of individual and collective action strategies and social movement theory in historical and contemporary perspectives.
Equivalent to: WS 523

WGSS 524. TRANS/GENDER POLITICS. (4 Credits)
Addresses transgender politics—including transsexual, genderqueer, and gender non-conforming issues—through feminist and intersectional approaches by analyzing transgender theories, arts, and activism. CROSSLISTED as QS 524/WGSS 524.
Equivalent to: QS 524

WGSS 525. GENDER AND TECHNOLOGY. (3 Credits)
Explores women’s contributions and focuses in technology fields. Analyzes gendered nature of technology. Theory and practice of technologies for change and activism.
Equivalent to: WS 525

WGSS 530. WOMEN OF COLOR FEMINISMS. (4 Credits)
Explores the contemporary experiences of women of color, as well as the theoretical and practical frameworks of women of color feminisms. Analyzes key themes in women of color feminisms, including politics of representation, multiple forms of state and interpersonal violence, intersecting forms of oppression, economic justice, reproductive justice, and strategies of resistance.
Equivalent to: WS 530
Recommended: WGSS 223 or WGSS 223H or WS 223 or WS 223H

WGSS 531. QUEER OF COLOR CRITIQUES. (4 Credits)
‘Queer of color critiques’ refers to political theories and activism that emerge from LGBTQ people of color to examine the intersections between race, sexuality and gender. Addresses these intersections through theory, history, and activism. CROSSLISTED as ES 431/QS 431/WGSS 431 and ES 531/QS 531/WGSS 531.
Equivalent to: ES 531, QS 531

WGSS 532. GENDER, SEXUALITY, AND THE PHOTOGRAPHIC IMAGE. (3 Credits)
A creative and discussion-based course focusing on ways in which photography can and has addressed issues of gender and sexuality. An introduction to key concepts and intersections in Women’s, Gender and Sexuality Studies; Queer Studies and photography theory. Create written and photographic responses to artworks, texts, personal experience and pop-culture. CROSSLISTED as ART 432/QS 432/WGSS 432 and ART 532/QS 532/WGSS 532.
Equivalent to: ART 532, QS 532

WGSS 535. FEMINIST TEACHING AND LEARNING. (4 Credits)
Focuses on the experiences and practices of the feminist classroom. Key components of the class include issues associated with the identity and development of the teacher, as well as the development of skills to help facilitate understanding, empowerment, and the personal and social agency of students.
Equivalent to: WS 535

WGSS 536. FEMINIST MEDIA STUDIES. (4 Credits)
Examination of print, radio, television, and new media from feminist perspectives.

WGSS 540. WOMEN AND NATURAL RESOURCES. (3 Credits)
Explores the relationship between women and natural resources. In particular, the course examines the roles of policy, technology, culture, and management in women’s use and control of natural resources.
Equivalent to: WS 540

WGSS 542. THE INCLUSIVE CLASSROOM: DIFFERENCE, POWER AND DISCRIMINATION. (3 Credits)
An examination of multidisciplinary scholarship on difference, power, and discrimination; critical pedagogies; and curriculum transformation. Discussions of theory and research are coupled with practical hands-on opportunities for students to develop and hone their teaching and course development skills. CROSSLISTED as GRAD 542/WGSS 542.
Equivalent to: GRAD 542

WGSS 550. ECOFEMINISM. (3 Credits)
Focuses on the ecological and feminist principles that mediate humanity’s relationship with nature.
Equivalent to: WS 550

WGSS 555. FEMINIST TEXTUAL AND DISCOURSE ANALYSIS. (4 Credits)
Graduate students are introduced to current methods and modes of feminist literary, visual culture, performance, new media, and film studies with a focus on application. In doing so, the course focuses on feminist approaches to key topics within textual studies (such as form, authors, and readers) as well as distinct methodological approaches to various genres and mediums (including poems, performances, photographs, and films).

WGSS 560. SEXUALITIES, FEMINISMS, WOMEN. (4 Credits)
Explores the historical, theoretical, and political dimensions of female sexuality. The course also examines the basic assumptions about the meaning of gendered sexuality, how it has been shaped and controlled, and why women’s sexuality has been/is a source of both women’s liberation and subjugation. In addition, the course incorporates Queer and Trans* theories about gendered/women’s sexualities.
Equivalent to: WS 560
Recommended: WGSS 223 or WGSS 223H or WGSS 224

WGSS 562. QUEER THEORIES. (4 Credits)
Engages key themes and critical frameworks in queer theories. Topics include histories of sexuality; forms of oppression, including heterosexism, homophobia, and transphobia; resistance to oppression; violence against LGBTQ people; queer activism; diverse experiences of sexuality; and representations in literature, art, and popular media. CROSSLISTED as QS 462/WGSS 462 and QS 562/WGSS 562.
Equivalent to: QS 562, WS 562
WGSS 566. FAT STUDIES. (4 Credits) 
Examines body weight, shape, and size as an area of human difference subject to privilege and discrimination that intersects with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. Employs a multi-disciplinary approach spanning the behavioral sciences and humanities. Frames weight-based oppression as a social justice issue, exploring forms of activism used to counter weightism perpetuated throughout various societal institutions. CROSSTLISTED as PSY 466/WGSS 466 and PSY 566/WGSS 566. 
Equivalent to: PSY 566, WS 566 
Recommended: WS 223 or WS 223H or WS 224 or WGSS 240 or WGSS 262 or WGSS 262H or WGSS 270 or WGSS 280 or WGSS 280H or WGSS 321 or WGSS 325 or WGSS 325H or WGSS 340 or WGSS 340H or WGSS 350 or WGSS 360 or WGSS 360H or WGSS 364 or WGSS 364H or WGSS 373 or WGSS 375 or WGSS 380 or WGSS 380H

WGSS 569. TOPICS IN JOTERIA STUDIES. (3 Credits) 
A space for engaging with arts, activism and scholarship emerging from queer Latinx/Chicano experiences and consciousness is provided. Offered winter term in odd years. CROSSTLISTED as ES 569/WS 569. 
Equivalent to: ES 569, WS 569, SPAN 569 
This course is repeatable for 6 credits.

WGSS 572. INDIGENOUS TWO-SPIRIT AND QUEER STUDIES. (4 Credits) 
'Two-spirit' refers to North American indigenous genders outside of European male/female binaries. Two-spirit communities argue for decolonization as a central political struggle, calling all people to unlearn settler colonial gender/sexuality on Native land. Addresses indigenous two-spirit/GLBTQ issues through theory, literature, activism, and art. CROSSTLISTED as ES 472/QS 472/WGSS 472 and ES 572/QS 572/WGSS 572. 
Equivalent to: ES 572, QS 572 
Recommended: Qs 262 or ES 242 or WGSS 414 or WGSS 514

WGSS 573. TRANSGENDER LIVES. (4 Credits) 
With a particular focus on transgender people of color and transnational constructions of gender, this course will engage issues in the lives of Transgender people through autobiography, memoir, biography, poetry, and documentary film. CROSSTLISTED as QS 473/WGSS 473 and QS 573/WGSS 573. 
Equivalent to: QS 573 
Recommended: WS 585/WGSS 262, WGSS/WS 364

WGSS 575. CRITICAL RACE FEMINISM AND OUTSIDER JURISPRUDENCE. (4 Credits) 
Critical exploration of critical legal justice movements and their relationship to social identities. Seminar emphasizes specific legal cases, federal and state laws, and constitutional issues that impact groups deemed outsiders in liberal discourse as well as their social implications. The critical justice movement and anti-subordination struggles will be explored via case analyses that shape race, class, gender, sexuality, and disability relations. Theoretical contributions of law and society, critical race theory, LatCrit, and critical race feminism, critical white studies, critical mixed race studies, OutCrit, ClassCrit, and critical disability studies applied to historical precedent and current attempts at marginalizing/empowering communities. CROSSTLISTED as ES 575/WGSS 575. 
Equivalent to: ES 575

WGSS 576. TRANSNATIONAL SEXUALITIES. (4 Credits) 
Explores contemporary experiences of sexualities within transnational contexts. Analyzes themes including queer and LGBTQI organizing, same-sex desires, queer transnational immigration and labor flows, sex industries and discourses of trafficking, sex tourism, and reproductive justice, using feminist, queer, and postcolonial theoretical frameworks. CROSSTLISTED as QS 476/WGSS 476 and QS 576/WGSS 576. 
Equivalent to: QS 576 
Reccommended: QS 262

WGSS 577. QUEER/TRANS PEOPLE OF COLOR ARTS AND ACTIVISM. (4 Credits) 
LGBTQ people of color often engage struggles for social justice through artistic movements. Focused on arts by LGBTQ people of color and the way these artistic movements contribute to activism that interrupts interlocking systems of oppression. CROSSTLISTED as ES 477/QS 477/WGSS 477 and ES 577/QS 577/WGSS 577.

Equivalent to: ES 577, QS 577 
Recommended: QS 262 and QS 464

WGSS 582. GLOBAL PERSPECTIVES ON WOMEN'S HEALTH. (4 Credits) 
Women's health issues are examined from a global perspective in the context of a woman's life and through a feminist political lens. Central to our discussions will be an analysis of the interplay among race, class, and gender in shaping particular health care outcomes. The course stresses the potential for women's agency and autonomy with respect to improving their health and environments.

Equivalent to: WS 582

WGSS 583. RACE, GENDER, AND HEALTH JUSTICE. (4 Credits) 
Based on a social justice framework, this course explores the intersections of race, gender, ethnicity, disability and sexuality to provide a deeper understanding of how these factors shape health inequities in diverse communities nationally and globally.

Equivalent to: WS 585

WGSS 586. GLOBAL EXPERIENCE I. (1 Credit) 
Prepares students to participate in a short-term study abroad experience that emphasizes volunteer experiences in women's organizations and analysis from transnational feminist perspectives.

Equivalent to: WS 586

WGSS 587. GLOBAL EXPERIENCE II. (1 Credit) 
Engages students in a short-term study abroad experience that emphasizes volunteer experiences in women's organizations and analysis from transnational feminist perspectives.

Equivalent to: WS 587 
Recommended: WS 486 or WS 586 or WGSS 486 or WGSS 586

WGSS 588. GLOBAL EXPERIENCE III. (1 Credit) 
Students reflect on their short-term study abroad experience by engaging in in-depth transnational feminist analysis of particular aspects of the study abroad experience.

Equivalent to: WS 588 
Recommended: (WS 586 and WS 587) or (WGSS 586 and WGSS 587)
WGSS 595. GLOBAL FEMINIST THEOLOGIES. (4 Credits)
Explores the connections between women's religious experiences around the world and the global problems addressed by feminist theology and spirituality.
Equivalent to: WS 595
Recommended: WS 223 or WS 223H or WS 224 or WS 225 or WS 226 or WS 228
WGSS 596. FEMINIST THEOLOGIES IN THE UNITED STATES. (4 Credits)
Explores U.S.-based feminist critiques of traditional theologies and examines feminist constructions of theologies rooted in diverse human experiences.
Equivalent to: WS 596
Recommended: WS 223 or WS 223H or WS 224 or WS 225 or WS 226 or WS 228
WGSS 599. TOPICS. (1-6 Credits)
Topics on contemporary research in women, gender, and sexuality. May be repeated for credit when topic varies.
Equivalent to: WS 599
This course is repeatable for 12 credits.
WGSS 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Individual and collaborative research and scholarship under the supervision of faculty.
This course is repeatable for 16 credits.
WGSS 602. INDEPENDENT STUDY. (1-16 Credits)
Independent study in some field of special interest under the supervision of a faculty member.
This course is repeatable for 16 credits.
WGSS 603. THESIS. (1-12 Credits)
Graded P/N.
This course is repeatable for 999 credits.
WGSS 605. READING AND CONFERENCE. (1-16 Credits)
Independent reading in specialized topics, guided by discussions in conference with faculty.
This course is repeatable for 16 credits.
WGSS 606. PROJECTS. (1-16 Credits)
Special project initiation and participation under the supervision of faculty. Graded P/N.
This course is repeatable for 16 credits.
WGSS 610. INTERNSHIP. (1-6 Credits)
The internship experience provides opportunities to gain experience in a private, public, or community agency or organization, which has social justice advocacy as one of its goals. Students work with an on-site mentor who guides their field experience in collaboration with the internship coordinator in the WGSS program. One feature of graduate internships is the opportunity to shadow key personnel in order to meet internship goals. Graded P/N.
This course is repeatable for 6 credits.
WGSS 611. COLLOQUIUM. (1 Credit)
Provides presentations of feminist research by OSU faculty and graduate students and faculty members from other institutions. Graded P/N.
This course is repeatable for 4 credits.
WGSS 616. MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS I. (4 Credits)
Introduces doctoral students to foundational and emerging themes and texts in women, gender, and sexuality studies, with particular emphases on women of color feminisms, transnational feminisms, and queer feminist critiques. The first seminar in a two-part sequence (WGSS 616 and 617).

WGSS 617. MULTIRACIAL, TRANSNATIONAL, AND QUEER FEMINISMS II. (4 Credits)
Introduces doctoral students to foundational and emerging themes and texts in women, gender, and sexuality studies, with particular emphases on women of color feminisms, transnational feminisms, and queer feminist critiques. The second seminar in a two-part sequence (WGSS 616 and 617).
Prerequisites: WGSS 616 with B or better
WGSS 618. FEMINIST PARTICIPATORY ACTION RESEARCH. (4 Credits)
An examination of theories, principles and strategies of PAR, and appreciation of advantages and limitations of this approach and skills necessary for participating effectively in PAR projects.
Recommended: Any upper-division graduate level course in research methods.
WGSS 619. DECOLONIZING METHODS. (4 Credits)
Navigates from feminist philosophy of science interventions to postcolonial, Chicana/Latina, and critical race criticisms of methodological stances in 'normal' science. Standpoint methodologies, racialized and gendered origins of modern statistical methods, longstanding affinity between colonial inequalities and Eurocentric scientific inquiry, and successor sciences/sciences from below constitute the main themes of the course.
WGSS 620. SOCIAL JUSTICE THEORY AND PRACTICE. (4 Credits)
An examination of social justice theories and practices. Specifically engages with issues of power and privilege, systems of oppression, intersectionality, and social activism. Explores the practices of social justice movements.

Wood Science and Engineering (WSE)

WSE 111. RENEWABLE MATERIALS FOR A GREEN PLANET. (2 Credits)
Renewable materials are an integral part of modern lifestyles, and current societal trends point to increased use of renewable materials. This course provides an overview of renewable materials and their current applications in society. As an overview course, it covers a breadth of renewable material uses and exposes students to life-cycle thinking.

WSE 210. *RENEWABLE MATERIALS TECHNOLOGY AND UTILIZATION. (4 Credits)
Characteristics and uses of renewable fiber products including wood, bamboo and grasses; manufacturing processes; effect of tree growth and harvesting on renewable products manufacturing and properties. Wood identification. Lec/lab. (Bacc Core Course)
Attributes: CPPS – Core, Pers, Physical Science
Equivalent to: FP 210

WSE 211. WOODTURNING WITH SCIENCE I. (4 Credits)
An introduction to scientific woodturning. Students will get a grounding in tools, lathes, sharpening, and set-up, and then will transition into turning basic forms (spindle and bowl). Particular relevance will be placed upon grain orientation, wood moisture content, wood anatomy, wood chemistry, wood species and extractive effects, and how all of these attributed affect both form and function. Class instruction will be entirely studio based. CROSSLISTED as ART 211/WSE 211.
Equivalent to: ART 211
This course is repeatable for 8 credits.

WSE 225. DEVELOPMENTS OF BUILDING DESIGN WITH RENEWABLE MATERIALS. (3 Credits)
Introduction to architectural design, considering the different building requirements and the solutions available, with a focus on wood-based products and other ligno-cellulosic materials.
WSE 250. CAD: COMPUTER AIDED DESIGN. (3 Credits)
Provides students with the tools and techniques to design and render products, furniture, and structures using Solidworks, as well as create technical drawings that facilitate communication between designers, engineers, and clients. The techniques developed during this course are applicable to a wide variety of industrial CAD and product design industries worldwide. Lec/lab/studio.

WSE 266. *INDUSTRIAL HEMP. (3 Credits)
Introduction to the botany, biology and agronomy of the hemp plant, and the origins, historical contexts and implications of contemporary legal and social issues surrounding its use for food, fiber, and building products. Taught via Ecampus only. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst; CPWC – Core, Pers, West Culture

WSE 299. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

WSE 320. ANATOMY OF RENEWABLE MATERIALS. (3 Credits)
Examination of macroscopic and microscopic anatomy of renewable (plant based) materials commonly used by society. Learning activities including lecture and the hands-on study of the various plant materials and their components with naked-eye, hand lens, and microscopic examination. Lec/lab.

WSE 321. CHEMISTRY OF RENEWABLE MATERIALS. (3 Credits)
Chemical structures and chemical properties of renewable plant-based materials will be taught at molecular levels. Chemical compositions of different renewable materials will be covered. Chemical and biochemical modifications and applications or renewable materials will be discussed in detail. Lec/lab.
Prerequisites: CH 122 with D- or better or CH 202 with D- or better or CH 232 with D- or better or CH 232H with D- or better

WSE 322. PHYSICAL AND MECHANICAL PROPERTIES OF RENEWABLE MATERIALS. (4 Credits)
Introduction to thermodynamics and mechanics of plant fibers, solid wood and bio-based composites: hygroscopicity, heat and mass transport; statics, elasticity and strength of materials; mechanical properties.
Prerequisites: WSE 321 with C- or better

WSE 324. RENEWABLE MATERIALS LABORATORY. (3 Credits)
Integrates the knowledge gained in the core science courses (WSE 321 and WSE 322) to help students obtain a deeper understanding of how chemistry, physics, and anatomy affect renewable material properties. The course uses renewable fiber materials such as hardwoods, softwoods, natural fibers, bamboo, composite wood products (e.g. OSB, plywood, MDF, etc.) and fiber-based products (e.g. wood-plastic composites, natural fiber composites, straw panels, paper, etc.) to examine the intricate relationships between fundamental properties and performance. Lec/lab.
Prerequisites: WSE 321 with C- or better and WSE 322 [C-]

WSE 350. SECONDARY PRODUCTS DESIGN AND MANUFACTURING. (3 Credits)
Provides students with hands-on experience designing and manufacturing wood furniture. Includes how to safely operate and properly maintain wood working equipment, as well as how to design for consumers with efficient manufacturing processes in mind. Lec/lab/studio.
Prerequisites: WSE 250 with C- or better

WSE 351. ADVANCED CAD: COMPUTER AIDED DESIGN. (3 Credits)
Develop advanced techniques using industry standard CAD software as it relates to wood based product, furniture, and structural design. Build upon the skills acquired during WSE 250 CAD: COMPUTER AIDED DESIGN and learn advanced Solidworks techniques. Introduction to Rhinoceros 3D software and various parametric plugins. Lec/studio.
Prerequisites: WSE 250 with C- or better

WSE 352. CAM FOR THE CNC ROUTER AND LASER ENGRAVER. (3 Credits)
Process G-code using CAM software for CNC routing operations, as well as create raster and vector drawings for laser cutting/engraving applications. Each student will work through the design process researching and conceptualizing ideas, 3D modeling designs, developing working prototypes, and fabricating a final product. Lec/lab/studio.
Prerequisites: WSE 350 with C- or better
Recommended: Introductory level CAD course or demonstrated proficiency in industry standard CAD software

WSE 385. *EVALUATING SUSTAINABILITY THROUGH LIFE CYCLE ANALYSIS. (3 Credits)
With increased focus on sustainability, it has become important to quantify a sustainability metric of a material, process, or a system. To that end an understanding of life cycle analysis (LCA) is needed that can be used to determine a sustainability metric. This Ecampus course presents the use of LCA to gain insights on the environmental and social impacts of the choices we make. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

WSE 392. *BAMBOOLOOZA: THE FASCINATING WORLD OF BAMBOO. (3 Credits)
An exploration of the world of bamboo and its application to renewable products. This course provides an in-depth understanding of a renewable material bamboo from its native form to processed products. Additionally, this course discusses the utilization and perception of bamboo in different societies of the world. Taught via Ecampus only. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

WSE 399. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 16 credits.

WSE 401. RESEARCH. (1-16 Credits)
Equivalent to: FP 401
This course is repeatable for 16 credits.

WSE 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.

WSE 405. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FP 405
This course is repeatable for 16 credits.

WSE 406. PROJECTS. (1-16 Credits)
Equivalent to: FP 406
This course is repeatable for 16 credits.
WSE 413. WOODTURNING WITH SCIENCE II. (4 Credits)
An in-depth look at how character in wood (figure, spalting, knots, etc.) affects machinability and output in both functional and aesthetic turning. Students will work with a wide range of spalted wood types and figure across numerous species while working on advanced turning forms. Particular emphasis will be placed upon how figure affects grain orientation, how spalting affects density and stability, and how the challenges with character wood can be overcome without specialty tools. Class instruction will be entirely studio based. CROSSLISTED as ART 413/WSE 413.
Prerequisites: WSE 210 with C- or better and WSE 211 [C-]
Equivalent to: ART 413, FP 413
This course is repeatable for 8 credits.

WSE 414. *ART AND DESIGN CAPSTONE. (4 Credits)
For the final term of a student's last year in the Renewable Materials Industrial Design program, this course brings together the basic collaborative design elements and technical background of each student in the creation of collaborative design projects with the intention of giving students real-world, problem-based design experience. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

WSE 425. TIMBER TECTONICS IN THE DIGITAL AGE. (4 Credits)
An exploration of the advances in design, construction and fabrication of timber buildings. Includes experimentation with both physical and digital models and a final project, in collaboration with UO Architecture students. Lec/lab/studio.
Recommended: Junior standing and knowledge of CAD

WSE 430. FUNDAMENTALS OF ENGINEERING MECHANICS. (4 Credits)
An introduction to fundamentals of engineering mechanics for RM students selecting Science and Engineering option. While in most aspects the course follows standard introductory mechanics courses for engineers, special attention is paid to elasticity and strength in cellular and anisotropic materials like solid wood and bio-based composites. The overall objective of this course is to provide fundamental knowledge and practical skills in the area of engineering mechanics and mechanical principles behind some of the most important methods of characterization, processing, and utilization of renewable biomaterials; commonly used today, emerging and future. Lec/lab.
Prerequisites: MTH 254 with D- or better and WSE 324 [B-]

WSE 444. STRAND-BASED COMPOSITES MANUFACTURE. (1 Credit)
The strand-based composites manufacturing process uses the results of research projects and the instructor's mill experience. All aspects of the process from wood procurement through pressing are discussed. This course will be valuable to those interested in a manufacturing career.

WSE 450. ENTREPRENEURIAL PRODUCT DEVELOPMENT I. (3 Credits)
Provides an entrepreneurial experience in product development, in which students design, produce, market, and sell a product in a business setting. Working as a team, students will design a product using renewable materials and are expected to perform and understand manufacturing techniques and processes to produce the product in limited quantities.
Prerequisites: WSE 250 with C- or better and WSE 455 [C-]

WSE 451. ENTREPRENEURIAL PRODUCT DEVELOPMENT II. (3 Credits)
Provides an entrepreneurial experience in product development, in which students design, produce, market, and sell a product in a business setting. Working as a team, students will design a product using renewable materials and are expected to perform and understand manufacturing techniques and processes to produce the product in limited quantities. Lab/studio.
Prerequisites: WSE 250 with C- or better and WSE 450 [C-] and WSE 455 [C-]

WSE 453. *FOREST PRODUCTS BUSINESS. (3 Credits)
Provides students with the skills necessary to operate effectively in the global forest products industry. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Recommended: ECON 201 and ECON 202

WSE 455. INDUSTRIAL MARKETING IN THE FOREST SECTOR. (3 Credits)
Marketing relies heavily on effective communication, so this course concentrates on written and oral communication. The course will arm students with the skills necessary to apply basic concepts of marketing of forest products. Application will be highlighted through examples and industry speakers relating course work to the day-to-day work in business.
Equivalent to: FP 455

WSE 458. DESIGN OF WOOD STRUCTURES. (3 Credits)
Study of basic wood properties and design considerations. Design of wood connectors, beams, columns, and beam columns. Introduction to plywood and glue laminated members. Design of structural diaphragms and shear walls. Taught via Ecampus only.
Prerequisites: CE 381 with C or better
Equivalent to: CE 484

WSE 461. BIO-BASED PRODUCTS MANUFACTURING. (4 Credits)
First of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include the major processing steps for the conversion of raw materials such as wood, bamboo, hemp, and cereal straws into products.
Prerequisites: WSE 210 with C- or better and WSE 321 [C-] and WSE 324 [C-]

WSE 462. ADVANCED MANUFACTURING 1. (4 Credits)
Second of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process design elements, quality control, and approaches to continuous process improvement.
Prerequisites: WSE 461 with C- or better

WSE 463. ADVANCED MANUFACTURING 2. (4 Credits)
Third of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process control, optimization, automation, and contemporary topics such as Big Data and the Internet of Things and the potential impacts of the trends on manufacturing enterprises.
Prerequisites: WSE 462 with C- or better
WSE 465. RENEWABLE MATERIALS MANUFACTURING EXPERIENCE. (2 Credits)
Learning about and visiting a number of renewable materials industrial and commercial operations representing all parts of the renewable materials value chain. The class will meet daily for one 5-day week immediately prior to the start of fall term. During the week, the students and at least one instructor will meet daily. Lectures will precede visits to industrial plants, mills and sites. At the end of the day, an instructor will participate in a debriefing session, reiterating what was learned during the day. Students will then submit a report on the day’s activities. The class includes daily travel and overnight stays.
This course is repeatable for 4 credits.

WSE 470. FORESTS, WOOD, AND CIVILIZATION. (3 Credits)
Multidisciplinary examination of issues related to the roles of forests, trees, and wood in civilization, as providers of commodities, ecosystem services, and spiritual and artistic inspiration. Issues include global supply and demand, wood ownership and political power, and perceptions and uses of forest resources in different societies. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues
Equivalent to: WSE 470H

WSE 470H. FORESTS, WOOD, AND CIVILIZATION. (3 Credits)
Multidisciplinary examination of issues related to the roles of forests, trees, and wood in civilization, as providers of commodities, ecosystem services, and spiritual and artistic inspiration. Issues include global supply and demand, wood ownership and political power, and perceptions and uses of forest resources in different societies. (Bacc Core Course)
Attributes: CSSI – Core, Synth, Global Issues; HNRS – Honors Course
Designator
Equivalent to: WSE 470

WSE 471. RENEWABLE MATERIALS IN BUILDING CONSTRUCTION. (3 Credits)
Building construction is a major application of renewable materials, primarily wood. This course explores material selection options, applications, and performance characteristics. Residential construction is emphasized, but non-residential construction applications will also be discussed. Concepts and interpretation of life cycle assessment are introduced.

WSE 473. BIOENERGY AND ENVIRONMENTAL IMPACT. (3 Credits)
Explores world’s use of woody biomass fuels, their potential to contribute to our region’s energy supply, and conversion technologies such as direct combustion, pyrolysis, and thermochemical modification. Also examines emissions and other environmental impacts of utilizing renewable materials to generate energy and manufacture products.
Prerequisites: (MTH 111 with D- or better or MTH 112 with D- or better or MTH 231 with D- or better or MTH 241 with D- or better or MTH 245 with D- or better or MTH 251 with D- or better or MTH 251H with D- or better) and (CH 122 [D-] or CH 222 [D-] or CH 232 [D-] or CH 232H [D-])

WSE 475. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)

WSE 499. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 99 credits.

WSE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FP 501
This course is repeatable for 16 credits.

WSE 503. THESIS. (1-16 Credits)
Equivalent to: FP 503
This course is repeatable for 999 credits.

WSE 505. READING AND CONFERENCE. (1-16 Credits)
Equivalent to: FP 505
This course is repeatable for 16 credits.

WSE 506. PROJECTS. (1-16 Credits)
Equivalent to: FP 506
This course is repeatable for 16 credits.

WSE 507. SEMINAR. (1 Credit)
Section 1: Beginning Seminar. Section 2: Seminar. Graded P/N.
Equivalent to: FP 507
This course is repeatable for 99 credits.

WSE 513. WOODTURNING WITH SCIENCE II. (4 Credits)
An in-depth look at how character in wood (figure, spalting, knots, etc.) affects machinability and output in both functional and aesthetic turning. Students will work with a wide range of spalted wood types and figure across numerous species while working on advanced turning forms. Particular emphasis will be placed upon how figure affects grain orientation, how spalting affects density and stability, and how the challenges with character wood can be overcome without specialty tools. Class instruction will be entirely studio based.
This course is repeatable for 12 credits.
Recommended: WSE 210 and WSE 211

WSE 514. ART AND DESIGN CAPSTONE. (4 Credits)
For the final term of a student’s last year in the Renewable Materials Industrial Design program, this course brings together the basic collaborative design elements and technical background of each student in the creation of collaborative design projects with the intention of giving students real-world, problem-based design experience.

WSE 516. INTRODUCTION TO SCULPTURAL WOODTURNING. (4 Credits)
The development of studio / sculptural woodturning has a unique history, and involves a cluster of specialized skills. This course blends historic woodturning practices with modern approaches and aesthetics to bring an understanding of wood science into this very specialized field of woodturning.
Prerequisites: WSE 513 with B or better and WSE 514 [B]
This course is repeatable for 12 credits.

WSE 520. THE GLOBAL CONTEXT OF THE FOREST SECTOR. (3 Credits)
Provides a broad knowledge base of business and marketing practices in the global forest industry. Includes a module on research ethics that fulfills OSU Graduate School requirements.

WSE 521. WOOD SCIENCE I. (4 Credits)
A comprehensive overview and integration of wood anatomy, wood physics, wood chemistry and wood mechanics; global contemporary issues impacting the wood and fiber sector; integration of basic wood sciences to understand the complex relationships between environment and wood material properties, and the influence of both on the use of wood-based materials.

WSE 522. WOOD SCIENCE II. (4 Credits)
Continuation of the comprehensive overview and integration of wood and fiber anatomy, physics, chemistry, and mechanics; integration of basic wood science to understand relationships with wood and fiber properties and their impact on final use. Focus on biological, chemical and physical degradation of wood; adhesion; and physical and engineering properties of wood. Lec/lab.
WSE 525. TIMBER TECTONICS IN THE DIGITAL AGE. (4 Credits)
An exploration of the advances in design, construction and fabrication of timber buildings. Includes experimentation with both physical and digital models and a final project, in collaboration with UO Architecture students. Lec/lab/studio. Recommended: Knowledge of CAD

WSE 526. STRUCTURAL HEALTH ASSESSMENT/MONITORING OF TIMBER BUILDINGS. (3 Credits)
Holistic approaches for the evaluation of the performance of timber systems and structures in a building. Learn about the tools available to experts for different analysis purposes, and to understand how data acquired from different techniques can be analyzed and used to inform building management and maintenance, fabrication and construction practices, and future design.

WSE 530. POLYMER COMPOSITES. (3 Credits)
A comprehensive survey of the material and mechanical properties of polymer-based composite materials including failure mechanisms, interfacial and nanoscale effects, and transport and thermal properties. Recommended: CHE 545 and multivariable calculus

WSE 535. POLYMER SYNTHESIS AND STRUCTURE. (3 Credits)
A comprehensive overview of various synthetic methods for various synthetic polymers; structures of various synthetic and natural polymers. Recommended: 3 credits of undergraduate organic chemistry or CH 331 or CH 334

WSE 533. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)
This course is repeatable for 99 credits.

WSE 535. POLYMER SYNTHESIS AND STRUCTURE. (3 Credits)
A comprehensive overview of various synthetic methods for various synthetic polymers; structures of various synthetic and natural polymers. Recommended: 3 credits of undergraduate organic chemistry or CH 331 or CH 334

WSE 533. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)
This course is repeatable for 99 credits.

WSE 534. FOREST PRODUCTS BUSINESS. (3 Credits)
Provides students with the skills necessary to operate effectively in the global forest products industry. Recommended: ECON 201 and ECON 202

WSE 555. INDUSTRIAL MARKETING IN THE FOREST SECTOR. (3 Credits)
Marketing relies heavily on effective communication, so this course concentrates on written and oral communication. The course will arm students with the skills necessary to apply basic concepts of marketing of forest products. Application will be highlighted through examples and industry speakers relating coursework to the day-to-day work in business. Equivalent to: FP 555

WSE 556. WOOD DESIGN. (4 Credits)
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab. Crosslisted as CE 584/WSE 558.

WSE 557. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)
This course is repeatable for 99 credits.

WSE 558. WOOD DESIGN. (4 Credits)
Study of basic wood properties and design considerations. Design and behavior of wood connectors, beams, columns and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls. Lec/lab. Crosslisted as CE 584/WSE 558.

WSE 559. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 99 credits.

WSE 560. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FP 601
This course is repeatable for 16 credits.

WSE 561. BIO-BASED PRODUCTS MANUFACTURING. (4 Credits)
First of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include the major processing steps for the conversion of raw materials such as wood, bamboo, hemp, and cereal straws into products. Recommended: WSE 210 and WSE 321 and WSE 324

WSE 562. ADVANCED MANUFACTURING 1. (4 Credits)
Second of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process design elements, quality control, and approaches to continuous process improvement. Recommended: WSE 461

WSE 563. ADVANCED MANUFACTURING 2. (4 Credits)
Third of a 3-term series exploring technologies and management practices associated with manufacturing products from wood and other renewable materials. Subjects covered include process control, optimization, automation, and contemporary topics such as Big Data and the Internet of Things and the potential impacts of the trends on manufacturing enterprises. Recommended: WSE 462

WSE 571. RENEWABLE MATERIALS IN BUILDING CONSTRUCTION. (3 Credits)
Building construction is a major application of renewable materials, primarily wood. This course explores material selection options, applications, and performance characteristics. Residential construction is emphasized, but non-residential construction applications will also be discussed. Concepts and interpretation of life cycle assessment are introduced.

WSE 573. BIOENERGY AND ENVIRONMENTAL IMPACT. (3 Credits)
Explores world's use of woody biomass fuels, their potential to contribute to our region's energy supply, and conversion technologies such as direct combustion, pyrolysis, and thermochemical modification. Also examines emissions and other environmental impacts of utilizing renewable materials to generate energy and manufacture products. Recommended: (MTH 111 or MTH 112 or MTH 231 or MTH 241 or MTH 245 or MTH 251 or MTH 251H) and (CH 122 or CH 222)

WSE 574. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WSE 575. ENVIRONMENTAL ASSESSMENT OF BUILDING MATERIALS. (4 Credits)

WSE 592. ADVANCED WOOD DESIGN. (4 Credits)
Study of advanced concepts in wood properties and design. Design and analysis of specialty wood connectors. Design of wood members for adverse conditions including fire design. Common failure mechanisms and forensic engineering concepts. Design for durability. Lec/lab. Recommended: Understanding of basic concepts in mechanics and timber design

WSE 599. SPECIAL TOPICS. (0-16 Credits)
This course is repeatable for 99 credits.

WSE 600. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FP 601
This course is repeatable for 16 credits.

WSE 603. THESIS. (1-16 Credits)
Equivalent to: FP 603
This course is repeatable for 999 credits.

WSE 604. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
Equivalent to: FP 604
This course is repeatable for 16 credits.

WSE 605. PROJECTS. (1-16 Credits)
Equivalent to: FP 606
This course is repeatable for 16 credits.

WSE 607. SEMINAR. (1 Credit)
Section 1: Beginning Seminar. Section 2: Graduate Seminar. Equivalent to: FP 607
This course is repeatable for 99 credits.

WSE 699. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.
World Languages and Cultures (WLC)

**WLC 159. *LANGUAGE, RACE AND RACISM IN THE US: AN INTRODUCTION. (4 Credits)**
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed notions. CROSSLISTED as ANTH 159/ES 159/WLC 159. (Bacc Core Course)
**Attributes:** CPDP – Core, Perspective, Difference/Power/Discrimination
**Equivalent to:** ANTH 159, ES 159

**WLC 221H. *MASTERPIECES OF GERMAN CINEMA. (3 Credits)**
An introduction to the serious study of German cinema, 1920 to present. Class lectures discussing key works of German cinema will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films accompany the lectures. Taught in English. Film fee will be required. (Bacc Core Course)
**Attributes:** CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
**Equivalent to:** WLC 221

**WLC 222. *WOMEN IN ITALIAN CINEMA. (3 Credits)**
An exploration of filmic portrayals of women as participants in social, economic and political life in Italy. Examines Italian cinema as a reflection of Italian culture. Focuses on women as protagonists, symbolic figures and filmmakers. Analysis will be presented through a variety of historical, critical and theoretical approaches. Taught in English. (Bacc Core Course)
**Attributes:** CPLA – Core, Pers, Lit and Arts
**Equivalent to:** IT 261

**WLC 230. *FRANCE TODAY: CULTURES WITHIN AND BEYOND ITS BORDERS. (3 Credits)**
An exploratory study of French culture and society since 1945. Topics include: decolonization, immigration, Francophone intellectual currents, France's European vocation, and social conflict today. Conducted in English. (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture
**Equivalent to:** FR 270, FR 270H, WLC 230H

**WLC 230H. *FRANCE TODAY: CULTURES WITHIN AND BEYOND ITS BORDERS. (3 Credits)**
An exploratory study of French culture and society since 1945. Topics include: decolonization, immigration, Francophone intellectual currents, France's European vocation, and social conflict today. Conducted in English. (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
**Equivalent to:** FR 230, FR 230H, WLC 230

**WLC 231. *GERMAN DICTATORSHIPS: NAZIS AND COMMUNISTS. (3 Credits)**
Introduction to the two best-known dictatorships in German society, National Socialism of the Third Reich from 1933-1945 and Socialism in the German Democratic Republic from 1949-1989 via the study of visual media (feature films, documentaries, newsreels, etc.) and other primary and secondary sources. (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture
**Equivalent to:** GER 231, GER 231H, WLC 231H

**WLC 231H. *GERMAN DICTATORSHIPS: NAZIS AND COMMUNISTS. (3 Credits)**
Introduction to the two best-known dictatorships in German society, National Socialism of the Third Reich from 1933-1945 and Socialism in the German Democratic Republic from 1949-1989 via the study of visual media (feature films, documentaries, newsreels, etc.) and other primary and secondary sources. (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture; HNRS – Honors Course Designator
**Equivalent to:** GER 231H

**WLC 232. *INTRODUCTION TO JEWISH CULTURE. (3 Credits)**
An overview of Jewish culture from its origins to the present day. Students will compare and contrast the lifestyles, ideologies, religious and cultural practices of Jews living in Israel and the United States; two divergent cultures that developed from similar roots. Taught in English. Taught via Ecampus only. (Bacc Core Course)
**Attributes:** CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Equivalent to:** HEBR 231

**WLC 233. *RUSSIAN CULTURE I. (3 Credits)**
Introduction to basic features of Russian culture originating in the past and continuing into the present. Aspects of history, politics, economics, geography, art, music, literature, and everyday life. Compares Russian culture with Western European and American culture. WLC 233: Old Russia; WLC 234: 19th Century; WLC 235: 20th Century. Taught in English. (H) (Bacc Core Course)
**Attributes:** CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Equivalent to:** RUS 231

**WLC 234. *RUSSIAN CULTURE II. (3 Credits)**
Introduction to basic features of Russian culture originating in the past and continuing into the present. Aspects of history, politics, economics, geography, art, music, literature, and everyday life. Compares Russian culture with Western European and American culture. WLC 233: Old Russia; WLC 234: 19th Century; WLC 235: 20th Century. Taught in English. (H) (Bacc Core Course)
**Attributes:** CPCD – Core, Pers, Cult Diversity; CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Equivalent to:** RUS 232

**WLC 235. *RUSSIAN CULTURE III. (3 Credits)**
Introduction to basic features of Russian culture originating in the past and continuing into the present. Aspects of history, politics, economics, geography, art, music, literature, and everyday life. Compares Russian culture with Western European and American culture. WLC 233: Old Russia; WLC 234: 19th Century; WLC 235: 20th Century. Taught in English. (H) (Bacc Core Course)
**Attributes:** CPCD – Core, Pers, Cult Diversity; CPWC – Core, Pers, West Culture; LACH – Liberal Arts Humanities Core
**Equivalent to:** RUS 233

**WLC 241. *GRIMMS’ FAIRY TALES. (4 Credits)**
We will read a selection of the most popular Grimms’ fairy tales and consider why they have remained so popular. What is it about fairy tales that has made them such a lasting source of creative inspiration into our time? Students will learn to understand and critique fairy tales and their role in Western cultures through analysis of the tales and creative adaptation of a tale for a modern audience. (Bacc Core Course)
**Attributes:** CPWC – Core, Pers, West Culture
**Equivalent to:** GER 241
WLC 261. *MASTERPIECES GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present. Class lectures discussing key works of German cinema will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films accompany the lectures. Taught in English. Film fee will be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts
Equivalent to: GER 261, GER 261H, WLC 261H

WLC 261H. *MASTERPIECES GERMAN CINEMA. (3 Credits)
An introduction to the serious study of German cinema, 1920 to present. Class lectures discussing key works of German cinema will offer a variety of historical, critical and theoretical approaches. Weekly screenings of important films accompany the lectures. Taught in English. Film fee will be required. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; HNRS – Honors Course Designator
Equivalent to: GER 261, GER 261H, WLC 261

WLC 301. *INTRODUCTION TO WORLD LANGUAGE AND CULTURE STUDIES. (4 Credits)
Addresses the structure, histories, and cultures associated with world languages and presents skills for learning languages more effectively. Includes related topics such as globalization, colonialism, and language justice; language policy, linguistic diversity, and language death; immigration and migration; race and racism. This is a required course in the WLC major in the Literacies thematic area. (Bacc Core Course)
Attributes: CPSI – Core, Pers, Soc Proc & Inst

WLC 320. *FRANCOPHONE CULTURES IN FILM. (3-9 Credits)
An exploration of the different cultures of France and the Francophone world through film. Students will delve into the heart of these societies and discover their socio-historical, political, economic and cultural context. Students' analytical and critical skills will be thoroughly solicited through various research and writing activities. Taught in English. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity
Equivalent to: FR 329, FR 329H, WLC 320H
This course is repeatable for 9 credits.

WLC 320H. *FRANCOPHONE CULTURES IN FILM. (3-9 Credits)
An exploration of the different cultures of France and the Francophone world through film. Students will delve into the heart of these societies and discover their socio-historical, political, economic and cultural context. Students' analytical and critical skills will be thoroughly solicited through various research and writing activities. Taught in English. (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; HNRS – Honors Course Designator
Equivalent to: FR 329, FR 329H, WLC 320
This course is repeatable for 9 credits.

WLC 321. *MODERN SPAIN THROUGH SPANISH CINEMA. (3 Credits)
Examines the history of modern Spain and its cinematography via the study of key Spanish films and cineastes in the twentieth and twenty-first centuries. (Bacc Core Course)
Attributes: CPLA – Core, Pers, Lit and Arts; CPWC – Core, Pers, West Culture
Equivalent to: SPAN 361

WLC 331. *CHINESE CULTURE I. (3 Credits)
Introduction to basic features of Chinese culture from ancient times to the 9th century. Topics include philosophy and religion, the Chinese language, literature and the arts, science and technology, government, family and gender, social and economic conditions, contacts with the outside world. Taught in English. Open to all students. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: CHN 331

WLC 332. *CHINESE CULTURE II. (3 Credits)
Introduction to basic features of Chinese culture from the 10th through the 19th centuries. Topics include philosophy and religion, literature and the arts, science and technology, government, family and gender, social and economic conditions, daily life, and contacts with the outside world. Taught in English. Open to all students. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: CHN 332

WLC 333. *CHINESE CULTURE III. (3 Credits)
Survey of important developments of Chinese society and culture from the early 20th century to the present. Topics include wars and revolutions, economic, political, and social conditions, the new culture movement, changing family structure and women's status, relationships within greater China (Mainland China, Taiwan, and Hong Kong). Taught in English. Open to all students. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: CHN 333

WLC 334. FASHION AND DESIGN IN THE FRANCOPHONE WORLD. (3 Credits)
A study of the world of French fashion and design: origins and history, what's new and exciting in French fashion today and attitudes about fashion and beauty of design that have given the French the inside track on prestige in this arena for centuries.
Equivalent to: FR 338

WLC 335. *JAPANESE CULTURE I. (3 Credits)
An introductory survey of Japanese history, arts, literature, society, and traditions from the ancient to the mid-19th century. Taught in English. May not be offered every year. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: JPN 331

WLC 336. *JAPANESE CULTURE II. (3 Credits)
An introductory survey of Japanese history, arts, literature, society, and traditions from the ancient to the mid-19th century. May not be offered every year. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: JPN 332

WLC 337. *JAPANESE CULTURE III. (3 Credits)
A survey of Japan from the mid-19th century to the present in areas including arts, literature, business, education, society, politics, and foreign relations. Taught in English. May not be offered every year. (NC) (Bacc Core Course)
Attributes: CPCD – Core, Pers, Cult Diversity; LACN – Liberal Arts Non-Western Core
Equivalent to: JPN 333
WLC 338. *DEAF CULTURE. (4 Credits)
Introduction to Deaf culture in the United States. Includes discussion and analysis of issues relevant to Deaf culture, including politics, language, education, art, literature, media representations, and contemporary life in the Deaf community. (Bacc Core Course)
Attributes: CPSI – Core, Perspective, Difference/Power/Discrimination

WLC 339. *DEAF HISTORY. (4 Credits)
This course covers the history of Deaf people and the Deaf community in the United States. It examines the historical and contemporary impacts of US social, political, legal, educational, and economic systems on the Deaf experience. (Bacc Core Course)
Attributes: CPWC – Core, Perspectives, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 429, FR 429H, WLC 429

WLC 360. INTERNATIONAL FILM FESTIVAL. (3 Credits)
Critical study of a selection of films screened at the Oregon State University’s International Film Festival. Topics include acting, sound, special effects, cinematography. CROSSTLISTED as FILM 360/WLC 360.
Equivalent to: FILM 360
This course is repeatable for 9 credits.
Recommended: Sophomore standing or higher.

WLC 361. (RE)FRAMING RACE THROUGH FILM PRODUCTION. (4 Credits)
A critical engagement of ways race and ethnicity are treated in nonfiction short film as students produce their own short film as a means of challenging dominant racial representations and narratives. Requires a basic understanding of ways that notions about race and ethnicity combine with ideologies about gender, sexuality, ability, class, etc. to perpetuate unjust systems and institutions. CROSSTLISTED as ES 361/QS 361/WGC 361/WLC 361.
Equivalent to: ES 361, QS 361, WGSS 361
Recommended: Prior filmmaking experience

WLC 373. APPROACHES TO SOCIAL JUSTICE. (3 Credits)
Study various ways of thinking about social justice and evaluate these in case studies and current events. As a basis for the Social Justice minor, write a research paper on the theoretical and practical aspects of a social justice issue. CROSSTLISTED as ANTH 373/ES 373/WGSS 373/WLC 373.
Equivalent to: ANTH 373, ES 373, WGSS 373

WLC 399. SPECIAL TOPICS. (1-16 Credits)
Graded P/N.
This course is repeatable for 16 credits.

WLC 410. WORLD LANGUAGE INTERNSHIP. (1-12 Credits)
Opportunities for juniors and seniors to apply skills in world language and knowledge of world culture at selected government, industry, or business placement sites. Allows students to transition from academic to work world. Interns are supervised and evaluated by employer and faculty coordinator. See also Oregon International Internships in the catalog section on International Programs. Graded P/N.
Equivalent to: FLL 410
This course is repeatable for 16 credits.
Recommended: Completion of 90 credits with 2.75 GPA or higher; completion of the third-year language course in one foreign language with 3.00 GPA or better, with at least three terms of study in the OSU School of Language, Culture, and Society.

WLC 429. *FRENCH SOCIETY THROUGH ITS CINEMA. (3 Credits)
An examination of French society through its own cinema. Via the screening and study of films from the various periods of French history, students will delve into the heart of French society and will discover the socio-historical, political, economic and cultural context. (Bacc Core Course)
Attributes: CPWC – Core, Perspectives, West Culture
Equivalent to: FR 429, FR 429H, WLC 429H

WLC 429H. *FRENCH SOCIETY THROUGH ITS CINEMA. (3 Credits)
An examination of French society through its own cinema. Via the screening and study of films from the various periods of French history, students will delve into the heart of French society and will discover the socio-historical, political, economic and cultural context. (Bacc Core Course)
Attributes: CPWC – Core, Perspectives, West Culture; HNRS – Honors Course Designator
Equivalent to: FR 429, FR 429H, WLC 429

WLC 459. LANGUAGE, RACE AND RACISM IN THE U.S.: ADVANCED STUDY. (4 Credits)
Unpack language, race and racism—as well as the intersections between those ideas—as cornerstones to understanding identity and society as inherently socially constructed ideas. Better understand how racism is produced and reproduced in talk and text (this will include symbols and signs), especially in the context of the denial of racism. Focuses on the language of racism, and more specifically, types of discourse that construct Whiteness as dominant over Color. CROSSTLISTED as ANTH 459/ES 459/WLC 459 and ANTH 559/ES 559/WLC 559.
Equivalent to: ANTH 459, ES 459

WLC 473. COMMUNITY-BASED LEARNING. (3 Credits)
A service-learning course that allows students to apply the theory and skills acquired in advanced linguistics, culture, and literature courses to specific needs of populations that speak a language taught in the department. It combines 80 hours of community-supervised fieldwork with an online academic component consisting of assigned readings, independent research, and ongoing reflective writing. Each student is expected to make significant contributions toward the completion of a deliverable product that benefits a native speaker community. Pre-advanced oral proficiency required.
This course is repeatable for 6 credits.

WLC 483. CUBAN CULTURE, POLITICS AND SOCIETY. (4 Credits)
One of two courses that comprise the Cuba Study Abroad Program. It introduces students to Cuban culture, politics (and particularly Cuba-U.S. relations during and after the Revolution) and arts via a combination of lectures/lessons led by invited specialists in their fields, readings, films and student activities. Students will learn about a variety of topics including migration, agriculture, health care, education, economics, religion/spirituality, gender, race, and the arts (literature, music and other performance). Given the interdisciplinary approach to this course, students will also be able to focus on other topics of interest to them/their program of study. CROSSTLISTED as ES 483/PS 483/WLC 483 and ES 583/PS 583/WLC 583.
Equivalent to: ENG 483, ES 483, PS 483

WLC 485. CAPSTONE IN SOCIAL JUSTICE. (2 Credits)
Working with an advisor from the Social Justice minor, conduct research to synthesize and extend analysis of a particular social justice issue, building on three previous papers or projects. Results are presented in a 10-15 page paper and a public poster, presentation or website. CROSSTLISTED as ANTH 485/ES 485/WGSS 485/WLC 485.
Prerequisites: (ANTH 373 with D- or better or ES 373 with D- or better or WGSS 373 with D- or better or WLC 373 with D- or better) and (ANTH 410 [D-] or ES 410 [D-] or WGSS 410 [D-] or WLC 410 [D-])
Equivalent to: ANTH 485, ES 485, WGSS 485
This course is repeatable for 4 credits.

WLC 499. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: WLC 499H
This course is repeatable for 16 credits.
WR 115. INTRODUCTION TO EXPOSITORY WRITING. (3 Credits)
Introduction to rhetorical concepts and writing strategies necessary for university level written composition. Includes substantial discussion of grammar, punctuation, and usage conventions of standard written English. Does not satisfy WR 121 requirement. Graded P/N.
This course is repeatable for 6 credits.

WR 121. *ENGLISH COMPOSITION. (3 Credits)
Introduction to critical thinking, the writing process, and the forms of expository writing. Intensive writing practice, with an emphasis on revision. The term in which the student takes the course is determined alphabetically. (Bacc Core Course)
Attributes: CSW1 – Core, Skills, WR I
Equivalent to: WR 121H

WR 201. *WRITING FOR MEDIA. (3 Credits)
Introduction to newspaper style. Introduction to reporting. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Equivalent to: LS 201
Recommended: Grade B or higher in WR 121 or WR 121H and 30 wpm typing speed.

WR 214. *WRITING IN BUSINESS. (3 Credits)
Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in business and industry. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 222. *ENGLISH COMPOSITION. (3 Credits)
Continued practice in expository writing with an emphasis on argumentation and research. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 224. *INTRODUCTION TO FICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
Equivalent to: WR 224H

WR 224H. *INTRODUCTION TO FICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
Equivalent to: WR 224
WR 228. *WRITING ABROAD. (3 Credits)
Prepares students to compose thoughtful, nuanced, and journalistically-grounded writing for a Web-based audience based on experiences studying abroad. By reading deeply in the lifestyle and creative nonfiction genres, students will develop strategies for communicating their observations effectively. Instruction follows an editorial model, allowing students to practice the role of editor, freelancer, and designer, all with an eye towards publishing in a course-affiliated online magazine. To achieve success in this course, students must demonstrate knowledge of writing techniques appropriate to the genre and must demonstrate editorial skill.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better

WR 230. *ESSENTIALS OF ENGLISH GRAMMAR. (3 Credits)
Introduces students to the structure of sentences with a focus on beginning grammar. Students in WR 230 will learn the differences between clauses and phrases, how to recognize subjects and predicates in a variety of sentence types, how to avoid the most common grammatical errors in student writing, and how to use punctuation correctly—and with intention. Students will complete readings, watch videos, participate in discussions, and demonstrate understanding through weekly quizzes. They will also challenge themselves with numerous writing activities, and complete writing analysis projects.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II

WR 239. INTRODUCTION TO WRITING FICTION AND CREATIVE NONFICTION. (3 Credits)
Explores how to write good stories, whether real or imagined. Students will read and write in both genres, identifying the elements that make stories more vivid, more human, and more true. Students will write informal pieces and one longer work in each genre, and will workshop one story or essay. Taught via Ecampus only.

WR 240. *INTRODUCTION TO NONFICTION WRITING. (3 Credits)
Discussion workshop. Student work examined in context of contemporary published work. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
This course is repeatable for 9 credits.

WR 241. *INTRODUCTION TO POETRY WRITING. (3 Credits)
Discussion workshop. Rudiments of mechanics and some background in development of modern poetry. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 250. *PODCAST STORYTELLING. (3 Credits)
Focuses on the skills needed to write, record, and produce informative and engaging podcasts. Students develop themes, write scripts, conduct interviews, and learn to make thoughtful editing decisions in the production of audio podcasts.
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better

WR 301. *PUBLISHING AND EDITING. (3 Credits)
Invites students to learn about editing and copyediting techniques, broader editorial decisions, and current publishing platforms. Students will learn about scholarly publishing in the U.S. and about how social media and public relations fit into this world. Participants will also explore editing within a rhetorical dimension, considering purpose and audience, as well as conventions of grammar, mechanics, and usage. Students will review a scholarly article reporting on research in editing and/or publishing; as well as develop a publication-ready work of their own. As part of a final project, the class will work toward a collaborative publication.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, GR II
Prerequisites: WR 121 with D- or better

WR 303. *WRITING FOR THE WEB. (3 Credits)
Concerns the production of instructive, informative, and rhetorically savvy writing for Web-based locations and applications. Helps people find information, get things done, convey their opinions, build communities, and collaborate on complex projects.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with D- or better or WR 121H with D- or better

WR 323. *ENGLISH COMPOSITION. (3 Credits)
Continued practice in writing with an emphasis on the elements of style: diction, tone, precision and economy, emphasis, figurative language.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1

WR 324. *SHORT STORY WRITING. (4 Credits)
Study and writing of the short story. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 224 with D- or better
This course is repeatable for 8 credits.

WR 327. *TECHNICAL WRITING. (3 Credits)
Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in scientific and technological fields.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
Equivalent to: WR 327H

WR 327H. *TECHNICAL WRITING. (3 Credits)
Continued practice in writing with an emphasis on the rhetorical and critical thinking demands of writers in scientific and technological fields.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
Equivalent to: WR 327

WR 329. WRITING FOR LAW AND LAW SCHOOL. (3 Credits)
Improves the rhetorical and structural sophistication of persuasive writing, and gives practice in writing the law application essay. Provides a thorough review of legal, grammatical, usage, and sentence-level errors.
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
WR 330. UNDERSTANDING GRAMMAR. (3 Credits)
Advanced study of traditional grammatical forms and conventional grammatical terms with emphasis on the assumptions underlying the structure of traditional grammar. (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better or Exam for Waiver - WR 121 with a score of 1
WR 340. CREATIVE NONFICTION WRITING. (4 Credits)
Intermediate study and writing of creative nonfiction.
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 240 with D- or better
This course is repeatable for 8 credits.
WR 341. POETRY WRITING. (4 Credits)
Study and writing of verse. (FA) (Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 241 with D- or better
This course is repeatable for 8 credits.
WR 353. WRITING ABOUT PLACES. (3 Credits)
Utilizing personal experience, reading, and research, students, study, discuss, and practice the conventions of writing about place far and near, global and local, for various audiences and in a range of formats.
Prerequisites: WR 121 with D- or better
WR 362. SCIENCE WRITING. (3 Credits)
Students learn and practice the conventions for writing scientific material for a variety of audiences. Involves writing and research assignments, multimedia presentations, lecture, and in-class and online activities.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
Equivalent to: WR 362H
WR 362H. SCIENCE WRITING. (3 Credits)
Students learn and practice the conventions for writing scientific material for a variety of audiences. Involves writing and research assignments, multimedia presentations, lecture, and in-class and online activities.
(Bacc Core Course)
Attributes: CSW2 – Core, Skills, WR II; HNRS – Honors Course Designator
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
Equivalent to: WR 362
WR 383. FOOD WRITING. (4 Credits)
Students will write about food and food issues for a variety of audiences, including print and digital, adapting their texts to become increasingly sophisticated critical thinkers and writers who can shape material effectively. Will also address food science and food studies from a historical and cultural background.
Prerequisites: (WR 121 with D- or better or WR 121H with D- or better) and (HC 199 [D-] or PHL 121 [D-] or WR 201 [D-] or WR 214 [D-] or WR 222 [D-] or WR 224 [D-] or WR 241 [D-] or WR 233 [D-] or WR 234 [D-] or WR 327 [D-] or WR 330 [D-] or WR 341 [D-] or WR 362 [D-])
WR 399. SPECIAL TOPICS. (1-16 Credits)
Equivalent to: WR 399H
This course is repeatable for 16 credits.
WR 399H. SPECIAL TOPICS. (1-16 Credits)
Attributes: HNRS – Honors Course Designator
Equivalent to: WR 399
This course is repeatable for 16 credits.
WR 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.
WR 402. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.
WR 403. THESIS. (1-16 Credits)
This course is repeatable for 16 credits.
WR 404. WRITING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
WR 405. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.
WR 406. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.
WR 407. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.
WR 408. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.
WR 411. THE TEACHING OF WRITING. (4 Credits)
Pedagogy and theory in composition; prepares teachers (secondary through college) in writing process, assignment design, evaluation, and grammar. Also focuses on students’ own writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
WR 414. ADVERTISING AND PUBLIC RELATIONS WRITING. (4 Credits)
Writing news releases, annual reports, brochures, newsletters, and other PR materials. Writing advertising copy.
Prerequisites: WR 121 with B or better or WR 121H with B or better
WR 416. ADVANCED COMPOSITION. (4 Credits)
The development of style and voice in both the personal and the academic essay.
Equivalent to: WR 416H
This course is repeatable for 8 credits.
WR 420. STUDIES IN WRITING. (4 Credits)
Selected topics in rhetoric and composition.
This course is repeatable for 8 credits.
WR 424. ADVANCED FICTIONWRITING. (4 Credits)
Workshop. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 324 with D- or better
This course is repeatable for 8 credits.
WR 435. SCIENTIFIC, TECHNICAL, & PROFESSIONAL COMMUNICATION CAPSTONE. (1 Credit)
Complete a portfolio comprised of material generated throughout previous courses in the Certificate in Scientific, Technical, and Professional Communication. CROSSLISTED as COMM 435/WR 435.
Equivalent to: COMM 435
Recommended: Completion of 18 credits towards the Scientific, Technical, and Professional Communication Certificate
WR 440. ADVANCED CREATIVE NONFICTION WRITING. (4-8 Credits)
An advanced course in creative nonfiction writing, centered around workshops of polished material.
Prerequisites: WR 340 with D- or better
This course is repeatable for 8 credits.
WR 441. ADVANCED POETRY WRITING. (4 Credits)
Advanced poetry workshop. (FA)
Attributes: LACF – Liberal Arts Fine Arts Core
Prerequisites: WR 341 with D- or better
This course is repeatable for 8 credits.
WR 448. MAGAZINE ARTICLE WRITING. (4 Credits)
Writing the magazine article. Analyzing markets and writing query and cover letters, marketing manuscripts to magazines. Interviewing and researching.

WR 449. CRITICAL REVIEWING. (4 Credits)
Writing critical reviews of books, television programs, movies, plays, and restaurants for newspapers and magazines. The role of criticism in popular culture.

WR 462. *ENVIRONMENTAL WRITING. (4 Credits)
Writing about environmental topics from multiple perspectives. Includes science journalism, research and writing on current scientific issues and controversies, and theories of rhetoric and environmentalism. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC
Prerequisites: WR 121 with C- or better or WR 121H with C- or better
This course is repeatable for 12 credits.

WR 466. PROFESSIONAL WRITING. (4 Credits)
Introduces the texts, contexts, and concepts important to the practice of professional communication in organizational contexts, addressing practical writing skills, rhetoric, ethics, and information design. Course readings concern what professional writers do and what theories govern their actions, bridging the gap between real-world problems and academic research.
Prerequisites: WR 121 with D- or better or WR 121H with D- or better

WR 475. RHETORICS OF RACE. (4 Credits)
By exploring the interrelated concepts of race, racialization, and racism, Rhetorics of Race problematizes race as a taken-for-granted phenomenon. Through reading, writing, and discussion, class participants study racial formations as historically specific and analyze contemporary forms of racism in the US. Readings and discussion pay close attention to how rhetoric and discourse have the power to reproduce and challenge white supremacy and race-based oppressions. Emphasizing the intersectionality of oppression—that racism necessarily takes place at intersections with other forms of subordination including sexism, homophobia, ableism, etc.—Rhetorics of Race draws from Queer Black Feminism, Chican@ Feminism, and Critical Race Theory.

WR 485. CONTEMPORARY RHETORIC THEORY. (4 Credits)
Familiarizes students with a range of theories that have significantly contributed to or influenced the field of modern and contemporary rhetorical research. The course examines scholars, concepts, and methodologies that are central to contemporary rhetorical theory, while touching on key critical theorists who, although may be considered outside the field of rhetoric studies, impact the ways in which language, persuasion, and communication are currently understood. From this work, students develop their own perspectives and generate evidence-based arguments concerning those same issues.
Prerequisites: WR 121 with C- or better or WR 121H with C- or better

WR 493. *THE RHETORICAL TRADITION AND THE TEACHING OF WRITING. (4 Credits)
Major past and contemporary theories of written communication, their historical context, and their impact on writing and the teaching of writing. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

WR 495. INTRODUCTION TO LITERACY STUDIES. (4 Credits)
Literacy studies in multidisciplinary contexts. Examines historical, theoretical, and practical relationships among reading, writing, language, culture, and schooling. (Writing Intensive Course)
Attributes: CWIC – Core, Skills, WIC

WR 497. DIGITAL LITERACY AND CULTURE. (4 Credits)
From pencils to pixels, telegraphs to texts, and semaphores to social networking, Digital Literacy and Culture focuses on the relationships between human expression and the technologies that provide context, meaning, and shape to those expressions.
Prerequisites: WR 121 with C- or better or WR 121H with C- or better

WR 499. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 16 credits.

WR 500. MFA RESIDENCY. (1-20 Credits)
Low-Residency Masters of Fine Arts Residency. Required course for graduate students in the Low-Residency Masters of Fine Arts in Creative Writing.
This course is repeatable for 48 credits.

WR 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)
This course is repeatable for 16 credits.

WR 502. INDEPENDENT STUDY. (1-16 Credits)
This course is repeatable for 16 credits.

WR 503. THESIS. (1-16 Credits)
This course is repeatable for 999 credits.

WR 504. WRITING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WR 505. READING AND CONFERENCE. (1-16 Credits)
This course is repeatable for 16 credits.

WR 506. PROJECTS. (1-16 Credits)
This course is repeatable for 16 credits.

WR 507. SEMINAR. (1-16 Credits)
This course is repeatable for 16 credits.

WR 508. WORKSHOP. (1-16 Credits)
This course is repeatable for 16 credits.

WR 509. PRACTICUM. (1-16 Credits)
Required practicum for graduate students teaching introduction to poetry writing.
This course is repeatable for 16 credits.

WR 511. THE TEACHING OF WRITING. (4 Credits)
Pedagogy and theory in composition; prepares teachers (secondary through college) in writing process, assignment design, evaluation, and grammar. Also focuses on student's own writing.

WR 512. CURRENT COMPOSITION THEORY. (4 Credits)
Current rhetoric and composition theory and its applications for teachers and writers.

WR 513. LOW-RESIDENCY MFA MENTORSHIP. (5-12 Credits)
Low-Residency Masters of Fine Arts Mentorship. Required course for graduate students in the Low-Residency Masters of Fine Arts in Creative Writing.
This course is repeatable for 36 credits.

WR 514. ADVERTISING AND PUBLIC RELATIONS WRITING. (4 Credits)
Writing news releases, annual reports, brochures, newsletters, and other PR materials. Writing advertising copy.

WR 516. ADVANCED COMPOSITION. (4 Credits)
The development of style and voice in both the personal and the academic essay.
This course is repeatable for 16 credits.

WR 517. TEACHING PRACTICUM: ENGLISH COMPOSITION. (2 Credits)
Required practicum for graduate students teaching English Composition.
WR 518. TEACHING PRACTICUM: WRITING IN BUSINESS. (1 Credit)
Pedagogy practicum for graduate students in the teaching of professional writing and communication. This course is required for GTA's who will teach WR 214, Writing in Business.  
This course is repeatable for 3 credits.

WR 519. TEACHING PRACTICUM: WR 222. (1 Credit)
This practicum prepares graduate teaching assistants to teach Writing 222 (Argumentation). It includes both theoretical and practical components, providing an overview of the curriculum and addressing course development, lesson planning, and pedagogical best practices. The practicum is required for SWLF graduate students with a focus in rhetoric and composition.

WR 520. STUDIES IN WRITING. (4 Credits)
Selected topics in rhetoric and composition.  
This course is repeatable for 8 credits.

WR 521. TEACHING PRACTICUM: FICTION WRITING. (1 Credit)
Required practicum for graduate students teaching introduction to fiction writing.  
This course is repeatable for 3 credits.

WR 522. TEACHING PRACTICUM: POETRY WRITING. (1 Credit)
Required practicum for graduate students teaching introduction to poetry writing.  
This course is repeatable for 3 credits.

WR 523. TEACHING PRACTICUM: NONFICTION WRITING. (1 Credit)
Required practicum for graduate students teaching introduction to nonfiction writing.  
This course is repeatable for 3 credits.

WR 524. ADVANCED FICTION WRITING. (4 Credits)
Advanced fiction workshop with an emphasis on developing longer pieces.  
This course is repeatable for 24 credits.

WR 525. ADVANCED SCIENTIFIC AND TECHNICAL WRITING. (4 Credits)
Combines scientific and technical writing with science journalism. Students will draw on a data set (preferably their own) to draft a scientific journal article, short grant proposal, magazine article, and letter of inquiry. They will also critically evaluate and edit documents by reviewing classmates' drafts.  
Equivalent to: PSM 525

WR 540. ADVANCED NONFICTION WRITING. (4 Credits)
Advanced creative nonfiction workshop with an emphasis on developing longer pieces.  
This course is repeatable for 24 credits.

WR 541. ADVANCED POETRY WRITING. (4 Credits)
Advanced poetry workshop.  
This course is repeatable for 24 credits.

WR 548. MAGAZINE ARTICLE WRITING. (4 Credits)
Writing the magazine article. Analyzing markets and writing query and cover letters, marketing manuscripts to magazines. Interviewing and researching.  
This course is repeatable for 8 credits.

WR 549. CRITICAL REVIEWING. (4 Credits)
Writing critical reviews of books, television programs, movies, plays, and restaurants for newspapers and magazines. The role of criticism in popular culture.

WR 562. ENVIRONMENTAL WRITING. (4 Credits)
Writing about environmental topics from multiple perspectives. Includes science journalism, research and writing on current scientific issues and controversies, and theories of rhetoric and environmentalism.  
Equivalent to: STC 562
This course is repeatable for 8 credits.
Recommended: WR 121

WR 566. PROFESSIONAL WRITING. (4 Credits)
Introduces the texts, contexts, and concepts important to the practice of professional communication in organizational contexts, addressing practical writing skills, rhetoric, ethics, and information design. Course readings concern what professional writers do and what theories govern their actions, bridging the gap between real-world problems and academic research.

WR 575. RHETORICS OF RACE. (4 Credits)
By exploring the interrelated concepts of race, racialization, and racism, Rhetorics of Race problematizes race as a taken-for-granted phenomenon. Through reading, writing, and discussion, class participates study racial formations as historically specific and analyze contemporary forms of racism in the US. Readings and discussion pay close attention to how rhetoric and discourse have the power to reproduce and challenge white supremacy and race-based oppressions. Emphasizing the intersectionality of oppression—that racism necessarily takes place at intersections with other forms of subordination including sexism, homophobia, ableism, etc.—Rhetorics of Race draws from Queer Black Feminism, Chican@ Feminism, and Critical Race Theory.

WR 585. CONTEMPORARY RHETORIC THEORY. (4 Credits)
Familiarizes students with a range of theories that have significantly contributed to or influenced the field of modern and contemporary rhetorical research. The course examines scholars, concepts, and methodologies that are central to contemporary rhetorical theory, while touching on key critical theorists who, although may be considered outside the field of rhetoric studies, impact the ways in which language, persuasion, and communication are currently understood. From this work, students develop their own perspectives and generate evidence-based arguments concerning those same issues.  
Recommended: WR 121

WR 589. THE RHETORICAL TRADITION AND THE TEACHING OF WRITING. (4 Credits)
Major past and contemporary theories of written communication, their historical context, and their impact on writing and the teaching of writing.

WR 595. INTRODUCTION TO LITERACY STUDIES. (4 Credits)
Literacy studies in multidisciplinary contexts. Examines historical, theoretical, and practical relationships among reading, writing, language, culture, and schooling.

WR 597. DIGITAL LITERACY AND CULTURE. (4 Credits)
From pencils to pixels, telegraphs to texts, and semaphores to social networking, Digital Literacy and Culture focuses on the relationships between human expression and the technologies that provide context, meaning, and shape to those expressions.  
Recommended: WR 121

WR 599. SPECIAL TOPICS. (1-16 Credits)
This course is repeatable for 30 credits.
Z 349. BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION. (3 Credits)
The earth's biodiversity is a precious inheritance that is threatened by an unprecedented extinction crisis. This course examines the evolutionary and ecological processes that have created this unique diversity of life, the importance of biodiversity in maintaining the earth's ecosystems, and methods used to conserve biodiversity for future generations. (Bacc Core Course)
Attributes: CSGI – Core, Synth, Global Issues
Equivalent to: BI 349

Z 350. ANIMAL BEHAVIOR. (3 Credits)
Concepts of behavior; sensory receptors, internal mechanisms governing responses; learning and habitation; social organization and communication.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Equivalent to: BI 350

Z 361. INVERTEBRATE BIOLOGY. (3 Credits)
Exploration of the diversity and evolutionary relationships among major invertebrate phyla with an emphasis on morphological features, functional aspects, and life history for each phylum.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 362. INVERTEBRATE BIOLOGY LABORATORY. (2 Credits)
Morphology and anatomy of representative invertebrates introduced in Z 361; diversity within phyla. Study is by dissections and both microscopic and macroscopic examination; field trip fee. Lab fee. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and Z 361 (may be taken concurrently) [C--]

Z 364. DIVERSITY OF LIFE: INVERTEBRATES. (5 Credits)
Exploration of the diversity and evolutionary relationships among major invertebrate groups with an emphasis on building and interpreting phyllogenetic trees as well as comparing and contrasting morphology, function, and life history within each group. Laboratory activities build scientific skills by exploring current hypotheses and tools for the study of invertebrate evolution.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 365. BIOLOGY OF INSECTS. (4 Credits)
Introduction to the study of insects, focusing on the biological attributes responsible for the success and dominance of insects. Emphasis on taxonomy, morphology, behavior, ecology, and coevolutionary interrelationships. Required field trips. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])

Z 371. VERTEBRATE BIOLOGY. (3 Credits)
Overview of vertebrate origins and phylogeny integrating several disciplines (anatomy, ecology, genetics, developmental biology, physiology, behavior, and evolution) to explore the structural and functional adaptations and evolutionary history of vertebrates. Lec.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])
Recommended: Completion or concurrent enrollment in Z 372

Z 372. VERTEBRATE BIOLOGY LABORATORY. (2 Credits)
Classification, identification, and natural history of vertebrates. Includes laboratory examination of specimens and frequent field trips (fee charged) emphasizing Oregon fauna. Lab fee.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and Z 371 (may be taken concurrently) [D-]

Z 374. DIVERSITY OF LIFE: VERTEBRATES. (5 Credits)
Examination of vertebrate origins and phylogeny, integrating several disciplines (molecular biology, anatomy, behavioral ecology, and evolution). Emphasizes critical thinking and the scientific process to explore the structural/functional adaptations and evolutionary history of vertebrates. Laboratory activities build scientific skills by exploring current hypotheses and tools for the study of vertebrate evolution.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and Z 371 (may be taken concurrently) [D-]

Z 422. COMPARATIVE/FUNCTIONAL VERTEBRATE ANATOMY. (5 Credits)
Phylogenetically-based study of the form and function of vertebrate organ systems, including integumentary, musculoskeletal, cardiopulmonary, digestive, and sensory. Lab emphasizes comparative form through dissection, and function through non-invasive experimentation. Lec/lab.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) and (CH 332 (may be taken concurrently) [D-] or CH 335 (may be taken concurrently) [D-] or BI 314 [D-] or BI 314H [D-] or BB 314 [D-] or BB 314H [D-])

Z 423. ENVIRONMENTAL PHYSIOLOGY. (3 Credits)
Comparative environmental physiology of animals with emphasis on adaptations to such aspects of the physical environment as temperature, water, ions, and gases. Consideration given to interactions between physiology and environment that influence the local and geographic distribution of animals.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C-] or BI 212H [C-]) and (BI 213 [C-] or BI 213H [C-]) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-]) and (CH 123 [C-] or (CH 233 [C-] or CH 233H [C-]) and (CH 263 [C-] or CH 263H [C-]))

Z 425. EMBRYOLOGY AND DEVELOPMENT. (5 Credits)
Prerequisites: (BI 311 with D- or better or BI 311H with D- or better) and (BI 314 [D-] or BI 314H [D-] or BB 314 [D-] or BB 314H [D-])
Z 431. VERTEBRATE PHYSIOLOGY I. (4 Credits)
Systems/concepts covered include motor reflexes, autonomic nervous system, digestion/metabolism, renal and osmoregulatory, endocrine and reproductive systems. First in Z 431, Z 432/Z 442 series. Lec/rec.
Prerequisites: (BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C-]) and (BI 213 [C] or BI 213H [C-]) and (CH 332 (may be taken concurrently) [C] or CH 335 (may be taken concurrently) [C])

Z 432. VERTEBRATE PHYSIOLOGY II. (3 Credits)
Systems/concepts covered include blood, immune, lymphatic, cardiovascular, and pulmonary. Second in the Z431, 432/442 series.
Prerequisites: Z 431 with C- or better

Z 437. VERTEBRATE ENDOCRINOLOGY. (4 Credits)
An exploration of vertebrate endocrinology that examines principles of hormone action, inter- and intracellular signaling mechanisms within endocrine axes, and comparative endocrine physiology, emphasizing concepts of homeostasis and methodologies for evaluating normal and physiological function. Students are provided multiple forums for class participation, in the form of scientific presentations and ‘mini-reports.’
Prerequisites: BB 314 with D- or better or BB 314H with D- or better

Z 438. BEHAVIORAL NEUROBIOLOGY. (3 Credits)
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C-]) and (BI 213 [C] or BI 213H [C-]) or (BI 204 [C] and BI 205 [C] and BI 206 [C]) and (CH 123 [C] or (CH 233 [C] or CH 233H [C]) and (CH 263 [C] or CH 263H [C])))

Z 440. INSECT PHYSIOLOGY. (3 Credits)
Fundamentals of insect physiology from the behavioral to the molecular level. Cellular physiology and hormonal control of molting, metamorphosis and reproduction. Overview of functions: respiration, circulation, digestion, metabolism, and osmoregulation. Physiological basis of behavior: muscles and flight, structure and functions of the nervous system, sensory physiology and chemical communication. The contributions of insect physiology to general physiological principles and biorational methods of insect pest control are discussed.
Prerequisites: (((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C-]) and (BI 213 [C] or BI 213H [C-]) or (BI 204 [C] and BI 205 [C] and BI 206 [C]) and (CH 123 [C] or ((CH 233 [C] or CH 233H [C]) and (CH 263 [C] or CH 263H [C])))
Equivalent to: ENT 416

Z 442. VERTEBRATE PHYSIOLOGY LABORATORY. (2 Credits)
Experiments and exercises in vertebrate physiology covering systems studied in Z 431 and Z 432. Available to Biology majors. Lab fee.
Prerequisites: Z 431 with C- or better and Z 432 (may be taken concurrently) [C-]

Z 461. MARINE AND ESTUARINE VERTEBRATE ZOOLOGY. (4 Credits)
Comparative survey of eight major invertebrate phyla and many lesser-known phyla. Areas of emphasis will be 1) invertebrate identification, 2) natural history (diversity, habitat, feeding, behavior), and 3) comparative anatomy (adaptive significance of morphological structures). Laboratories and field trips will strongly supplement lecture material. Lec/lab. Taught at Hatfield Marine Science Center.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C-]) and (BI 213 [C] or BI 213H [C-]) or (BI 204 [C] and BI 205 [C] and BI 206 [C])

Z 473. HERPETOLOGY. (4 Credits)
Exploration of global herpetofauna focusing on taxa of the Pacific Northwest of North America. Identification and natural history of amphibians and reptiles are emphasized, along with a phylogenetic framework, to explore and discuss ideas involving their behavior, evolution, ecology, and conservation. Student projects examine important topics in the field.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C-]) and (BI 213 [C] or BI 213H [C-])) or (BI 204 [C] and BI 205 [C] and BI 206 [C])

Z 477. AQUATIC ENTOMOLOGY. (4 Credits)
Biology, ecology, collection, and identification of aquatic insects. Two required Saturday field trips. Lec/lab.
Prerequisites: ((BI 211 with C- or better or BI 211H with C- or better) and (BI 212 [C] or BI 212H [C-]) and (BI 213 [C] or BI 213H [C-])) or (BI 204 [C] and BI 206 [C])

Z 499. SPECIAL TOPICS. (0-16 Credits)
Topics and credits vary.
Equivalent to: Z 499H
This course is repeatable for 16 credits.

Z 499H. SPECIAL TOPICS. (1-16 Credits)
Topics and credits vary.
Equivalent to: Z 499
This course is repeatable for 16 credits.
<table>
<thead>
<tr>
<th>Code</th>
<th>Contact</th>
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<tbody>
<tr>
<td>AAE</td>
<td>Undergraduate: Cassie Pitkin, 541-737-7991, <a href="mailto:cassie.pitkin@oregonstate.edu">cassie.pitkin@oregonstate.edu</a>; Graduate: Lynn Paul, 541-737-3644; <a href="mailto:lynn.paul@oregonstate.edu">lynn.paul@oregonstate.edu</a></td>
</tr>
<tr>
<td>ACTG</td>
<td>Undergraduate: 541-737-3716, 122 AUST; Graduate: <a href="mailto:OSUMBA@oregonstate.edu">OSUMBA@oregonstate.edu</a>, 541-737-5510, 326 AUST; Cascades campus: Satoris Howes, 541-706-2276, <a href="mailto:satoris.howes@osucascades.edu">satoris.howes@osucascades.edu</a></td>
</tr>
<tr>
<td>AEC</td>
<td>Tjodie Richardson, 213 BALE, 541-737-1399; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
</tr>
<tr>
<td>AED</td>
<td>Josh Stewart, 130A STAG, 541-737-2854</td>
</tr>
<tr>
<td>AG</td>
<td>Dawn Moyer, 108A STAG, 541-737-5403</td>
</tr>
<tr>
<td>AGRI</td>
<td>Penelope Diebel, 147B STAG, 541-737-5317</td>
</tr>
<tr>
<td>AHE</td>
<td>Sue Helback, Furman 104, 541-737-4661</td>
</tr>
<tr>
<td>AJ</td>
<td>Jillian Saint Jacques, 352 Moreland Hall, 541-737-1662, <a href="mailto:jillian.St.Jacques@oregonstate.edu">jillian.St.Jacques@oregonstate.edu</a></td>
</tr>
<tr>
<td>ALS</td>
<td>Academic Success Center, 541-737-2272; Cascades campus: Neil Browne, 541-322-3129, <a href="mailto:neil.browne@osucascades.edu">neil.browne@osucascades.edu</a></td>
</tr>
<tr>
<td>AMS</td>
<td>Neil Browne, 541-322-3129, <a href="mailto:neil.browne@osucascades.edu">neil.browne@osucascades.edu</a></td>
</tr>
<tr>
<td>ANS</td>
<td>Dodi Reesman, 126 WITH, 541-737-4761</td>
</tr>
<tr>
<td>ANTH</td>
<td>Juliane Freeman, Waldo 238, <a href="mailto:freemanj@oregonstate.edu">freemanj@oregonstate.edu</a>; Cascades campus: Natalie Dollar, 541-322-3140, <a href="mailto:ndollar@osucascades.edu">ndollar@osucascades.edu</a></td>
</tr>
<tr>
<td>ARAB</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
</tr>
<tr>
<td>ARE</td>
<td>Jack Istok, Kearney 101, 541-737-4934</td>
</tr>
<tr>
<td>ART</td>
<td>Felix Oliveros, 300 Fairbanks, 541-737-5002; Cascades campus: Kiel Fletcher, 541-322-2096, <a href="mailto:kiel.fletcher@osucascades.edu">kiel.fletcher@osucascades.edu</a></td>
</tr>
<tr>
<td>AS</td>
<td>Lt. Col. Warren B. Brainard, 308 MCAF; Lauri Reynolds, 541-737-3291</td>
</tr>
<tr>
<td>ASL</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
</tr>
<tr>
<td>ASN</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
</tr>
<tr>
<td>ATS</td>
<td><a href="mailto:ceoas.class.scheduling@oregonstate.edu">ceoas.class.scheduling@oregonstate.edu</a>, 541-737-6238; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
</tr>
<tr>
<td>BA</td>
<td>Undergraduate: 541-737-3716, 122 AUST; Graduate: <a href="mailto:OSUMBA@oregonstate.edu">OSUMBA@oregonstate.edu</a>, 541-737-5510, 326 AUST; Cascades campus: Satoris Howes, 541-706-2276, <a href="mailto:satoris.howes@osucascades.edu">satoris.howes@osucascades.edu</a></td>
</tr>
<tr>
<td>BB</td>
<td>Andy Karplus, 2011B ALS, 541-737-4511; Cascades campus: Patrick Ball, 541-322-3188, <a href="mailto:pat.ball@osucascades.edu">pat.ball@osucascades.edu</a></td>
</tr>
<tr>
<td>BDS</td>
<td>Jeff Chang, 541-737-5278 Ext. 5279, 3098/3097 CORD, Joseph Spatafora, 541-737-5304 Ext. 5305, 2082 CORD</td>
</tr>
<tr>
<td>BEE</td>
<td>John P. Bolte, 116 GILM, 541-737-2041</td>
</tr>
<tr>
<td>BHS</td>
<td>Mary Fulton, 226 Nash, <a href="mailto:mary.fulton@oregonstate.edu">mary.fulton@oregonstate.edu</a></td>
</tr>
<tr>
<td>BI</td>
<td>Department of Integrative Biology, 3029 CORD, 541-737-2993, <a href="mailto:ib@oregonstate.edu">ib@oregonstate.edu</a>; Cascades campus: Patrick Ball, 541-322-3188, <a href="mailto:pat.ball@osucascades.edu">pat.ball@osucascades.edu</a></td>
</tr>
<tr>
<td>BIOE</td>
<td>Head Advisor, 116 Johnson, 541-737-4791</td>
</tr>
<tr>
<td>BOT</td>
<td>Joseph Spatafora, 541-737-5304 Ext. 5305, 2082 CORD</td>
</tr>
<tr>
<td>BRR</td>
<td>Wanda Crannell, 158A STAG, 541-737-2999</td>
</tr>
<tr>
<td>CBEE</td>
<td>Head Advisor, 116 Johnson, 541-737-4791</td>
</tr>
<tr>
<td>CCE</td>
<td>Jack Istok, 220 Owen, 541-737-8547</td>
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<tr>
<td>CE</td>
<td>Jack Istok, 220 Owen, 541-737-8547</td>
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<tr>
<td>CEM</td>
<td>Jack Istok, 220 Owen, 541-737-8547</td>
</tr>
<tr>
<td>CH</td>
<td>Department of Chemistry, 153 GILB, 541-737-2081, <a href="mailto:chemistry.registration@oregonstate.edu">chemistry.registration@oregonstate.edu</a>; Cascades campus: Scott Geddes, 541-322-2037, <a href="mailto:scott.geddes@osucascades.edu">scott.geddes@osucascades.edu</a></td>
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<tr>
<td>CHE</td>
<td>Head Advisor, 116 Johnson Hall, 541-737-4791</td>
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<tr>
<td>Acronym</td>
<td>Contact Information</td>
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<tr>
<td>CHN</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
</tr>
<tr>
<td>COMM</td>
<td>Speech Communication Office, 541-737-2461, <a href="mailto:speech.comm@oregonstate.edu">speech.comm@oregonstate.edu</a>, 104 Shephard Hall; Cascades campus: Natalie Dollar, 541-322-3140, <a href="mailto:ndollar@osucascades.edu">ndollar@osucascades.edu</a></td>
</tr>
<tr>
<td>COUN</td>
<td>Sue Helback, Furman 104, 541-737-4661; Cascades campus: Amy Ford, 541-322-3123, <a href="mailto:amy.ford@osucascades.edu">amy.ford@osucascades.edu</a></td>
</tr>
<tr>
<td>CROP</td>
<td>Stefan Seiter, <a href="mailto:seiters@oregonstate.edu">seiters@oregonstate.edu</a></td>
</tr>
<tr>
<td>CS</td>
<td>Sherry Barrett, 1148 KEC, 541-737-5556, <a href="mailto:sherry.barrett@oregonstate.edu">sherry.barrett@oregonstate.edu</a>; Cascades campus: Yong Bakos, 541-322-2060, <a href="mailto:yong.bakos@osucascades.edu">yong.bakos@osucascades.edu</a></td>
</tr>
<tr>
<td>CSS</td>
<td>Stefan Seiter, <a href="mailto:seiters@oregonstate.edu">seiters@oregonstate.edu</a></td>
</tr>
<tr>
<td>CSSA</td>
<td>Head Advisor, <a href="mailto:cssa@oregonstate.edu">cssa@oregonstate.edu</a></td>
</tr>
<tr>
<td>DCH</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
</tr>
<tr>
<td>DHE</td>
<td>Undergraduate: 541-737-3716, 122 AUST; Graduate: <a href="mailto:OSUMBA@oregonstate.edu">OSUMBA@oregonstate.edu</a>, 541-737-5510, 326 AUST</td>
</tr>
<tr>
<td>DSGN</td>
<td>Undergraduate: 541-737-3716, 122 AUST; Graduate: <a href="mailto:OSUMBA@oregonstate.edu">OSUMBA@oregonstate.edu</a>, 541-737-5510, 326 AUST</td>
</tr>
<tr>
<td>EAH</td>
<td>Jacob Hamblin, 322 Milam, <a href="mailto:jacob.hamblin@oregonstate.edu">jacob.hamblin@oregonstate.edu</a></td>
</tr>
<tr>
<td>ECE</td>
<td>Sherry Barrett, 1148 KEC, 541-737-5556, <a href="mailto:sherry.barrett@oregonstate.edu">sherry.barrett@oregonstate.edu</a>; Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
</tr>
<tr>
<td>ECON</td>
<td>Laura Relyea, 541-737-2369, <a href="mailto:laura.relyea@oregonstate.edu">laura.relyea@oregonstate.edu</a>; Cascades campus: Satoris Howes, 541-706-2276, <a href="mailto:satoris.howes@osucascades.edu">satoris.howes@osucascades.edu</a></td>
</tr>
<tr>
<td>ED</td>
<td>Sue Helback, Furman 104, 541-737-4661; Cascades campus: Carolyn Platt, 541-322-3120, <a href="mailto:carolyn.platt@osucascades.edu">carolyn.platt@osucascades.edu</a></td>
</tr>
<tr>
<td>ENG</td>
<td>School of Writing, Literature, and Film, MORE 238, 541-737-3244. Course Information: <a href="http://liberalarts.oregonstate.edu/wlf/students/courses">http://liberalarts.oregonstate.edu/wlf/students/courses</a> (<a href="http://liberalarts.oregonstate.edu/wlf/students/courses/">http://liberalarts.oregonstate.edu/wlf/students/courses/</a>); Cascades campus: Neil Browne, 541-322-3129, <a href="mailto:neil.browne@osucascades.edu">neil.browne@osucascades.edu</a></td>
</tr>
<tr>
<td>ENGR</td>
<td>COE Office of Student Services, 114 JOHN, 541-737-5236; Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
</tr>
<tr>
<td>ENSC</td>
<td>Undergraduate: <a href="mailto:ceoaas.class.scheduling@oregonstate.edu">ceoaas.class.scheduling@oregonstate.edu</a>, 541-737-6238; Graduate: Carolyn Fonyo, 104 WILK, 541-737-5095; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
</tr>
<tr>
<td>ENT</td>
<td>Vaughn Walton, 4105C, <a href="mailto:vaughn.walton@oregonstate.edu">vaughn.walton@oregonstate.edu</a></td>
</tr>
<tr>
<td>ENVE</td>
<td>Head Advisor, 116 Johnson Hall, 541-737-4791</td>
</tr>
<tr>
<td>ES</td>
<td>Robert Thompson, 252 Waldo, 541-737-0709</td>
</tr>
<tr>
<td>ESE</td>
<td>Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
</tr>
<tr>
<td>FCSJ</td>
<td>Sarah Cunningham, 225 Waldo, 541-737-1304</td>
</tr>
<tr>
<td>FE</td>
<td>Department Office, 211 Snell, 541-737-4952</td>
</tr>
<tr>
<td>FES</td>
<td>Department Office, 321 RICH, 541-737-2244; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
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<tr>
<td>FILM</td>
<td>School of Writing, Literature, and Film, MORE 238, 541-737-3244. Course Information: <a href="http://liberalarts.oregonstate.edu/wlf/students/courses">http://liberalarts.oregonstate.edu/wlf/students/courses</a> (<a href="http://liberalarts.oregonstate.edu/wlf/students/courses/">http://liberalarts.oregonstate.edu/wlf/students/courses/</a>); Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
</tr>
<tr>
<td>FOR</td>
<td>Department Office, 211 Snell, 541-737-4952; Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
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<td>FR</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a>; Ecampus: Karen Mills, 541-737-3847, <a href="mailto:kmills@oregonstate.edu">kmills@oregonstate.edu</a></td>
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<tr>
<td>FST</td>
<td>Dan Smith, 541-737-3131</td>
</tr>
<tr>
<td>FW</td>
<td>Bruce Dugger, 166 Nash, 541-737-2465; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
</tr>
<tr>
<td>GD</td>
<td>Felix Oliveros, 300 Fairbanks, 541-737-5002; Cascades campus: Kiel Fletcher, 541-322-2096, <a href="mailto:kiel.fletcher@osucascades.edu">kiel.fletcher@osucascades.edu</a></td>
</tr>
<tr>
<td>GEO</td>
<td><a href="mailto:ceoas.class.scheduling@oregonstate.edu">ceoas.class.scheduling@oregonstate.edu</a>, 541-737-6238; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
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<tr>
<td>GEOG</td>
<td><a href="mailto:ceoas.class.scheduling@oregonstate.edu">ceoas.class.scheduling@oregonstate.edu</a>, 541-737-6238; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
</tr>
<tr>
<td>GER</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a>; Ecampus: Adela Hall, <a href="mailto:adelhaall@oregonstate.edu">adelhaall@oregonstate.edu</a></td>
</tr>
<tr>
<td>GPH</td>
<td><a href="mailto:ceoas.class.scheduling@oregonstate.edu">ceoas.class.scheduling@oregonstate.edu</a>, 541-737-6238</td>
</tr>
<tr>
<td>GRAD</td>
<td>Matt Tradewell, <a href="mailto:matthew.tradewell@oregonstate.edu">matthew.tradewell@oregonstate.edu</a></td>
</tr>
<tr>
<td>GS</td>
<td>Heather Arbuckle, 109 Kidder, 541-737-4811</td>
</tr>
<tr>
<td>H</td>
<td>Rick Settersten and Russ Turner, 541-737-2643; Cascades campus: Kara Witzke, 541-322-2063, <a href="mailto:kara.witzke@osucascades.edu">kara.witzke@osucascades.edu</a></td>
</tr>
<tr>
<td>HC</td>
<td>Susan Rodgers, <a href="mailto:susan.rodgers@oregonstate.edu">susan.rodgers@oregonstate.edu</a>; Cascades campus: Patrick Ball, 541-322-3188, <a href="mailto:pat.ball@osucascades.edu">pat.ball@osucascades.edu</a></td>
</tr>
<tr>
<td>HDFS</td>
<td>Rick Settersten, 401 Waldo, 541-737-2686; Cascades campus: Shannon Lipscomb, 541-322-3137, <a href="mailto:shannon.lipscomb@osucascades.edu">shannon.lipscomb@osucascades.edu</a></td>
</tr>
<tr>
<td>HEBR</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
</tr>
<tr>
<td>HEST</td>
<td>Cassie Pitkin, 541-737-7991, <a href="mailto:cassie.pitkin@oregonstate.edu">cassie.pitkin@oregonstate.edu</a></td>
</tr>
<tr>
<td>HHS</td>
<td>HHS 231 &amp; HHS 241 contact Erica Woelk, 541-737-4111, 123 Lang HHS 199 &amp; HHS 206 contact Vicki Ebbeck, 541-737-8900, 105 WB HHS 500 level courses contact Rick Settersten, 541-737-2686, 401 Wald Or Russ Turner, 541-737-2643 Cascades campus: Kara Witzke, 541-322-2063, <a href="mailto:kara.witzke@osucascades.edu">kara.witzke@osucascades.edu</a></td>
</tr>
<tr>
<td>HM</td>
<td>Todd Montgomery, 541-322-2086, <a href="mailto:todd.montgomery@osucascades.edu">todd.montgomery@osucascades.edu</a></td>
</tr>
<tr>
<td>HORT</td>
<td>Kelly Donegan, 4155 ALS, 541-737-5448, <a href="mailto:katherine.donegan@oregonstate.edu">katherine.donegan@oregonstate.edu</a></td>
</tr>
<tr>
<td>HST</td>
<td>David Bishop, 322B Milam, 541-737-8918, <a href="mailto:david.bishop@oregonstate.edu">david.bishop@oregonstate.edu</a>; Cascades campus: Neil Browne, 541-322-3129, <a href="mailto:neil.browne@osucascades.edu">neil.browne@osucascades.edu</a></td>
</tr>
<tr>
<td>HSTS</td>
<td>David Bishop, 322B Milam, 541-737-8918, <a href="mailto:david.bishop@oregonstate.edu">david.bishop@oregonstate.edu</a></td>
</tr>
<tr>
<td>IB</td>
<td>Department of Integrative Biology, 3029 COR, 541-737-2993, <a href="mailto:ib@oregonstate.edu">ib@oregonstate.edu</a></td>
</tr>
<tr>
<td>IE</td>
<td>Undergraduate: Cassie Pitkin, 541-737-7991, <a href="mailto:cassie.pitkin@oregonstate.edu">cassie.pitkin@oregonstate.edu</a>; Graduate: Lynn Paul, 541-737-3644, <a href="mailto:lynn.paul@oregonstate.edu">lynn.paul@oregonstate.edu</a>; Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
</tr>
<tr>
<td>IEPA</td>
<td>Jerry Archer, 182 ILLC, 541-737-2384</td>
</tr>
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<td>IEPG</td>
<td>Jerry Archer, 182 ILLC, 541-737-2384</td>
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<td>IEPH</td>
<td>Jerry Archer, 182 ILLC, 541-737-2384</td>
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<td>INTL</td>
<td>Kerry Thomas, International Degree, University Plaza Suite 130, 541-737-5223</td>
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<td>IST</td>
<td>David Bernell, 336 Bexell Hall, 541-737-6281</td>
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<td>IT</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>JPN</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>KIN</td>
<td>Russ Turner, 541-737-2643; Cascades campus: Kara Witzke, 541-322-2063</td>
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<td>KOR</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>LA</td>
<td>Tristen Shay, 214 Bexell, 541-737-0561, <a href="mailto:liberalarts@oregonstate.edu">liberalarts@oregonstate.edu</a></td>
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<td>Course Subject Area</td>
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<td>LAT</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>LEAD</td>
<td>Jonathan Velez, 130C STAG, 541-737-1336</td>
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<td>LIB</td>
<td>Anne-Marie Deitering, 121 Valley Library, 541-737-4667</td>
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<td>LING</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>LS</td>
<td>214 Bexell, 541-737-0561, <a href="mailto:liberalarts@oregonstate.edu">liberalarts@oregonstate.edu</a>; Cascades campus: Neil Browne, 541-322-3129, <a href="mailto:neil.browne@osucascades.edu">neil.browne@osucascades.edu</a></td>
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<td>MATS</td>
<td>William Warnes, 204 ROG, 541-737-7016</td>
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<td>MB</td>
<td>Mary Fulton, 226 Nash, <a href="mailto:mary.fulton@oregonstate.edu">mary.fulton@oregonstate.edu</a>; Cascades campus: Patrick Ball, 541-322-3188, <a href="mailto:pat.ball@osucascades.edu">pat.ball@osucascades.edu</a></td>
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<td>MCB</td>
<td>Kirstin Carroll, 2082 CORD, <a href="mailto:kirstin.carroll@oregonstate.edu">kirstin.carroll@oregonstate.edu</a></td>
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<tr>
<td>ME</td>
<td>Undergraduate: Cassie Pitkin, 541-737-7991, <a href="mailto:cassie.pitkin@oregonstate.edu">cassie.pitkin@oregonstate.edu</a>; Graduate: Lynn Paul, 541-737-3644, <a href="mailto:lynn.paul@oregonstate.edu">lynn.paul@oregonstate.edu</a>; Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
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<tr>
<td>MFGE</td>
<td>Undergraduate: Cassie Pitkin, 541-737-7991, <a href="mailto:cassie.pitkin@oregonstate.edu">cassie.pitkin@oregonstate.edu</a>; Graduate: Lynn Paul, 541-737-3644, <a href="mailto:lynn.paul@oregonstate.edu">lynn.paul@oregonstate.edu</a></td>
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<tr>
<td>MGMT</td>
<td>Undergraduate: 541-737-3716, 122 AUST; Graduate: <a href="mailto:OSUMBA@oregonstate.edu">OSUMBA@oregonstate.edu</a>, 541-737-5510, 326 AUST; Cascades campus: Satoris Howes, 541-706-2276, <a href="mailto:satoris.howes@osucascades.edu">satoris.howes@osucascades.edu</a></td>
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<td>MIME</td>
<td>Undergraduate: Cassie Pitkin, 541-737-7991, <a href="mailto:cassie.pitkin@oregonstate.edu">cassie.pitkin@oregonstate.edu</a>; Graduate: Lynn Paul, 541-737-3644, <a href="mailto:lynn.paul@oregonstate.edu">lynn.paul@oregonstate.edu</a>; Cascades campus: Rebecca Webb, 541-322-3167, <a href="mailto:rebecca.webb@osucascades.edu">rebecca.webb@osucascades.edu</a></td>
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<td>MNR</td>
<td>Department Office, 321 Richardson, 541-737-6088</td>
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<td>MPP</td>
<td>Brent S. Steel, 318 Bexell, 541-737-6133</td>
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<td>MRKT</td>
<td>Undergraduate: 541-737-3716, 122 AUST; Graduate: <a href="mailto:OSUMBA@oregonstate.edu">OSUMBA@oregonstate.edu</a>, 541-737-5510, 326 AUST; Cascades campus: Satoris Howes, 541-706-2276, <a href="mailto:satoris.howes@osucascades.edu">satoris.howes@osucascades.edu</a></td>
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<tr>
<td>MS</td>
<td>Maj Kevin Consedine, MCAF 203; Cindy Rossi, 541-737-3511; Cascades campus: Paul Brown, 541-330-4397, <a href="mailto:paul.brown@oregonstate.edu">paul.brown@oregonstate.edu</a></td>
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<td>MTH</td>
<td>368 Kidder, 541-737-4686; Cascades campus: Scott Geddes, 541-322-2037, <a href="mailto:scott.geddes@osucascades.edu">scott.geddes@osucascades.edu</a></td>
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<td>MUED</td>
<td>Kristin Rorrer, 301 Fairbanks, 541-737-7255</td>
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<td>NMC</td>
<td>Daniel Gruss, <a href="mailto:daniel.gruss@oregonstate.edu">daniel.gruss@oregonstate.edu</a>, 030F Snell Hall; Cascades campus: Kiel Fletcher, 541-322-2096, <a href="mailto:kiel.fletcher@osucascades.edu">kiel.fletcher@osucascades.edu</a></td>
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<td>NR</td>
<td>Terina McLachlain, 408 Snell, 541-737-2088; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
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<td>NS</td>
<td>CAPT. W.E. Sisson III, Navy Armory; Lauri Morris, 541-737-6289</td>
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<td>NSE</td>
<td>Heidi Braly, Batcheller 151, 541-737-7062</td>
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<td>NUTR</td>
<td>Russ Turner, 541-737-2643; Cascades campus: Kara Witzke, 541-322-2063, <a href="mailto:kara.witzke@osucascades.edu">kara.witzke@osucascades.edu</a></td>
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<td>OC</td>
<td><a href="mailto:ceoas.class.scheduling@oregonstate.edu">ceoas.class.scheduling@oregonstate.edu</a>, 541-737-6238</td>
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<td>OEAS</td>
<td><a href="mailto:ceoas.class.scheduling@oregonstate.edu">ceoas.class.scheduling@oregonstate.edu</a>, 541-737-6238</td>
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<td>OP</td>
<td>Geoff Raynak, 541-332-3163, <a href="mailto:geoff.raynak@osucascades.edu">geoff.raynak@osucascades.edu</a></td>
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<tr>
<td>PAC</td>
<td>Drew Ibarra, <a href="mailto:PAC.FSF@oregonstate.edu">PAC.FSF@oregonstate.edu</a>, 123C LANG, 541-737-6811; Cascades campus: Kara Witzke, 541-322-2063, <a href="mailto:pac.cascades@oregonstate.edu">pac.cascades@oregonstate.edu</a></td>
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<td>PAX</td>
<td>David Bishop, 322B Milam, 541-737-8918, <a href="mailto:david.bishop@oregonstate.edu">david.bishop@oregonstate.edu</a></td>
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<td>Kelly Donegan, 4155 ALS, 541-737-5448, <a href="mailto:katherine.donegan@oregonstate.edu">katherine.donegan@oregonstate.edu</a></td>
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<td>PH</td>
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<td>Department of Physics, Weniger 301, 541-737-4631, <a href="mailto:physics@oregonstate.edu">physics@oregonstate.edu</a>; Cascades campus: Scott Geddes, 541-322-2037, <a href="mailto:scott.geddes@osucascades.edu">scott.geddes@osucascades.edu</a></td>
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<td>Angela Austin Haney, 203 PHAR, 541-737-3424</td>
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<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>Andrew Edwards, 418 Bexell, 541-737-1879. For appointments, see <a href="http://liberalarts.oregonstate.edu/spp/polisci/students/political-science-advising">http://liberalarts.oregonstate.edu/spp/polisci/students/political-science-advising</a> <a href="http://liberalarts.oregonstate.edu/spp/polisci/students/political-science-advising/">http://liberalarts.oregonstate.edu/spp/polisci/students/political-science-advising/</a>; Cascades campus: Natalie Dollar, 541-322-3140, <a href="mailto:ndollar@osucascades.edu">ndollar@osucascades.edu</a></td>
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<td>School of Psychological Science Office, Reed Lodge, 541-737-2311, <a href="mailto:psych.science@oregonstate.edu">psych.science@oregonstate.edu</a>; Cascades campus: Peter Sparks, 541-322-2057, <a href="mailto:peter.sparks@osucascades.edu">peter.sparks@osucascades.edu</a></td>
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<td>Bruce Weber, 240G BALE, 541-737-1432</td>
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<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>Sue Helback, Furman 104, 541-737-4661</td>
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<td>Badege Bishaw, 208 RICH, 541-737-9495</td>
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<td>Helen Fleming, <a href="mailto:helen.fleming@oregonstate.edu">helen.fleming@oregonstate.edu</a>; Cascades campus: Natalie Dollar, 541-322-3140, <a href="mailto:ndollar@osucascades.edu">ndollar@osucascades.edu</a></td>
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<td>Stefan Seiter, <a href="mailto:seiters@oregonstate.edu">seiters@oregonstate.edu</a>; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
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<td>Natalie Dollar, 541-322-3140, <a href="mailto:ndollar@osucascades.edu">ndollar@osucascades.edu</a></td>
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<td>Statistics Department and Ecampus: Mary Gardner, 239 WNGR, 541-737-3366; Cascades campus: Scott Geddes, 541-322-2037, <a href="mailto:scott.geddes@osucascades.edu">scott.geddes@osucascades.edu</a></td>
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<td>Corvallis Campus: Sustainability Advisor, 3017 ALS, <a href="mailto:Sus.Advising@oregonstate.edu">Sus.Advising@oregonstate.edu</a>; Cascades campus: Ron Reuter, 541-322-3109, <a href="mailto:ron.reuter@osucascades.edu">ron.reuter@osucascades.edu</a></td>
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<td>Kristin Rorrer, 301 Fairbanks, 541-737-7255</td>
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<td>Sara Ash, Autzen House, 541-737-2450</td>
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<td>Craig Marcus, 1007 ALS, 541-737-3791</td>
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<td>Corvallis campus: Department Office, 321 RICH, 541-737-2244; Cascades campus: Michael Gassner, 541-322-3131, <a href="mailto:michael.gassner@osucascades.edu">michael.gassner@osucascades.edu</a></td>
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<td>Janine Kobel, 541-737-7969, <a href="mailto:janine.kobel@oregonstate.edu">janine.kobel@oregonstate.edu</a></td>
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<td>Kate Scollan, <a href="mailto:kate.scollan@oregonstate.edu">kate.scollan@oregonstate.edu</a></td>
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<tr>
<td>WGSS</td>
<td>Mehra Shirazi, Director of Undergraduate Studies, <a href="mailto:Mehra.Shirazi@oregonstate.edu">Mehra.Shirazi@oregonstate.edu</a>, Waldo 264; Kryn Freehling-Burton, Ecampus Coordinator, <a href="mailto:kryn.freehling-burton@oregonstate.edu">kryn.freehling-burton@oregonstate.edu</a>, Waldo 268</td>
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<td>WLC</td>
<td>Freddy León, 234 Kidder, <a href="mailto:freddy.leon@oregonstate.edu">freddy.leon@oregonstate.edu</a></td>
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<td>WR</td>
<td>School of Writing, Literature and Film, MORE 238, 541-737-3244. Course Information: <a href="http://liberalarts.oregonstate.edu/wlf/students/courses">http://liberalarts.oregonstate.edu/wlf/students/courses</a>; Cascades campus: Neil Browne, 541-322-3129, <a href="mailto:neil.browne@osucascades.edu">neil.browne@osucascades.edu</a></td>
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<td>WSE</td>
<td>Department Office, 119 RICH, 541-737-4257</td>
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<td>Z</td>
<td>Department of Integrative Biology, 3029 CORD, 541-737-2993, <a href="mailto:ib@oregonstate.edu">ib@oregonstate.edu</a>; Cascades campus: Patrick Ball, 541-322-3188, <a href="mailto:pat.ball@osucascades.edu">pat.ball@osucascades.edu</a></td>
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EARNING A DEGREE AT OREGON STATE UNIVERSITY

Administration
Office of the Registrar
B102 Kerr Admin. Bldg.
Corvallis, OR 97331-2130
Phone: 541-737-6616
Email: registrars@oregonstate.edu
Website: http://registrar.oregonstate.edu

Rebecca Mathern, University Registrar, 541-737-6616
Mike Jefferis, Associate Registrar - Catalog, Curriculum & Scheduling, 541-737-0604
Jennifer Ketterman, Associate Registrar - Operations, 541-737-2830
Kristin Benson, Associate Registrar - Compliance, 541-737-2012
Tursynay Issabekova, Senior Assistant Registrar - Technology, 541-737-9984
Autumn Landis, Assistant Registrar - Athletics and Eligibility, 541-737-2018

University Degree Requirements
Current degree requirements are printed each year in the Academic Regulations (p. 16) section of the Academic Catalog, along with other information on a wide range of topics from minimum credits for full-time status to adding courses. All students are encouraged to review this part of Academic Catalog each year for the most current information about OSU requirements and procedures.

Students with questions about baccalaureate degree requirements are encouraged to contact their advisor. Students needing assistance in selecting a major or selecting an advisor may wish to call or stop by the college office.

Catalog Rights Policy
Graduation Requirements/Catalog Contract Policy
When determining the graduation requirements for a given student:

- Students must meet all applicable degree requirements from the published catalog(s).
- The student’s catalog year for institutional and baccalaureate core requirements is established by their first term of attendance (matriculation date) at Oregon State University as an admitted student.
- The student’s catalog year for college/major/option/minor requirements is based on the date of declaration of the major/option/minor.
- A student’s major and option(s) must be in the same catalog year. If an option(s) is declared in an academic year subsequent to the catalog year associated with the major, the option(s) will be aligned with the catalog year of the major. If the option(s) did not exist in the catalog year of the major, the major will roll forward to the catalog year of the option(s). A second major and option(s) may be declared by the student for a catalog year which differs from the first major and option(s).
- Additionally, while the student’s first major/option must be in the same catalog year, any additional declarations of majors/options/minors will be determined by the declaration dates (and corresponding catalog year) established by the change of academic program process.
- A student, in collaboration with an advisor, can also move their major/option/minor catalog year forward.
- At the time of graduation, all continuously enrolled students, including transfer students, may not use a catalog that is more than ten years old. Students may petition their college’s head advisor for an extension of a catalog greater than ten years prior to their expected graduation term.
- Current policy requires a student to reapply after not enrolling at OSU for four consecutive terms (not including summer terms). The published catalog for the resulting readmission/matriculation date will become the catalog of record for graduation requirements. The Planned Educational Leave Program defined in AR 13.c (p. 18) beginning with the 2011–2012 academic year, provides a mechanism for a student to keep their original catalog of record during a planned absence.
- For Degree Partnership Program students, the first term the student is admitted to OSU will be the matriculation date and will determine the catalog year for institutional and baccalaureate core requirements. The catalog year for college/major/option/minor requirements will be the same as all other OSU students.
- Every effort has been made to ensure the accuracy of information in the OSU Academic Catalog. However, Oregon State University may find it necessary from time to time to make changes in courses, curricula, or degree requirements. Students already admitted to a program in which such changes have been made will be reasonably accommodated, if possible, to ensure their normal progress toward a degree. A student may, however, still be required to conform to changes in courses, curricula, or degree requirements as deemed necessary by Oregon State University.

The Baccalaureate Experience
Oregon State University is committed to creating an atmosphere of intellectual curiosity, academic freedom, diversity, and personal empowerment. This will enable everyone to learn with and from others. This compelling learning experience celebrates knowledge; encourages personal growth and awareness; acknowledges the benefits of diverse experiences, world views, learning styles, and values; and engenders personal and societal values that benefit the individual and society.

OSU develops curricula based on sound disciplinary knowledge and input from practitioners. Students acquire skills and knowledge for a lifetime of learning, and will be involved in scholarly and creative pursuits.

The baccalaureate degree includes:

- the baccalaureate core
- an in-depth study in at least one major; and
- individual elective courses.

Minors are available in many areas and are required in certain programs. Students should check college, school, program, or departmental requirements.

The Baccalaureate Core (bacc core) Curriculum represents what the OSU faculty believes is the foundation for students’ further understanding of the modern world. Informed by natural and social sciences, arts, and humanities, the bacc core requires students to think critically and creatively, and to synthesize ideas and information when evaluating major societal issues. Importantly, the bacc core promotes understanding
of interrelationships among disciplines in order to increase students’ capacities as ethical citizens of an ever-changing world.

**The Baccalaureate Core**

The Oregon State University Baccalaureate Core (p. 1614) is continually enriched. It emphasizes critical thinking, writing, world cultures, appreciation of differences, the arts, sciences, literature, lifelong fitness, and global awareness in 15 course categories. Over 250 courses are available to meet core requirements. Students must complete a total of 48 credits plus a Writing Intensive Course (WIC) of at least 3 credits.

The Faculty Senate Baccalaureate Core Committee determines which courses will satisfy each of the requirements above. WIC courses will be reviewed by the WIC Director and the Faculty Senate Baccalaureate Core Committee. The core is governed by the following rules: (1) No more than two courses from any one department may be used by a student to satisfy the Perspectives category of the core. (2) No single course may be used by a student to satisfy more than one subject area of the core even though some courses have been approved in more than one area. (3) Both Synthesis courses may not be taken in the same department. (4) The WIC course must be taken in the student’s major. Each interdisciplinary major has a list of approved WIC courses for that major. (WIC Rationale (http://wic.oregonstate.edu/wic-learning-outcomes)) A current list of approved Baccalaureate Core courses can be found in the OSU Catalog (p. 1614).

Defining characteristics of baccalaureate core courses are available on the Office of Academic Programs and Assessment website (https://apa.oregonstate.edu/assessment/baccalaureate-core-assessment/). Additional information is also available online (http://main.oregonstate.edu/baccalaureate-core/).

The purpose of the writing intensive requirement is to insure that each graduate is prepared to write in the discourse, conventions, and genres of their major field.

A student completing requirements for two majors, including double degrees as well as dual majors (one degree with two majors), may request that one WIC course satisfy the WIC requirement for graduation in both majors. This opportunity is available if and only if:

1. The discourse, written conventions, and genres of the two majors are closely related, and
2. The substitution of a WIC course from one major for that in another major is approved in writing by the chairs or heads of both departments involved and the approval is placed in the student’s academic file.

Students and advisors should be aware that in some cases, the WIC course in a major is an integral part of the degree and substitution may not be appropriate. The final decision rests with the department chair or head.

**Baccalaureate Core Requirements**

No single course may be used by a student to satisfy more than one area of the Baccalaureate core even though some courses are approved for more than one area.

**Skilled Courses (lower division except WIC) (15)**

To support students’ success in all courses, the following first-year Skills courses are to be taken and completed satisfactorily within the first 45 hours of OSU-generated credits:

1. Writing I (3) (WR 121, must earn at least C–)
2. Speech (3)
3. Mathematics: MTH 105, *Intro to Contemporary Mathematics, or higher level mathematics (3)
4. Physical Science (including lab) (4)
5. Biological Science (including lab) (4)
6. Plus choice of additional physical or biological science (including lab) (4)

**Take a minimum of one course in each of the following areas:**

- Cultural Diversity (3)
- Literature and the Arts (3)
- Social Processes and Institutions (3)
- Western Culture (3)

**Difference, Power, and Discrimination Courses (lower or upper division) (3)**

**Synthesis Courses (upper division) (6)**

Both synthesis courses may not be taken in the same department. One course is from each of the following areas:

1. Contemporary Global Issues (3)
2. Science, Technology, and Society (3)
3. WIC (Writing Intensive Course, upper division, included in credits for major) (3)

The WIC course must be taken in the student’s major. Each interdisciplinary major has a list of approved WIC courses for that major.

**Total (48) + WIC (3) = 51**

**Approved Baccalaureate Core Courses**

For the current and complete list of approved baccalaureate core courses (p. 1614).

**Monitoring Degree Progress with MyDegrees**

MyDegrees is a web-based degree checklist program and academic advising tool designed to assist students and advisors in reviewing degree progress. It organizes a student’s academic transcript
chronologically and categorically, identifying courses they have completed and courses still needed to fulfill the degree requirements.

Students may access this tool through MyOSU (https://myosu.oregonstate.edu), or through links on the Office of the Registrar website (http://registrar.oregonstate.edu). Video tutorials on how to use MyDegrees are available on the Office of the Registrar website (http://registrar.oregonstate.edu/video-tutorials/).

The Office of the Registrar works with advisors to update and maintain an accurate degree audit that will be used to clear student degree requirements during the final term of the students’ undergraduate year.

**Major Program**

In-depth study in at least one area is required in each baccalaureate degree. Major requirements often include not only courses within the given discipline but also necessary prerequisites and work in related areas.

Students must satisfy all the requirements of their major department and major college. The dean’s certification of fulfillment of all requirements of the major college is required.

**Upper-Division Courses**

1. **Credits in upper-division courses:** minimum 60 (exclusive of upper-division physical education activity courses).
2. **Credits in each major:** minimum 36, including at least 24 in upper-division courses.

For further details on upper-division course requirements, see Academic Regulation 25c (p. 21), Institutional Requirements for Baccalaureate Degrees.

**Practicum Courses and Internships**

Academic performance is not the sole criterion for admission to and continuation in certain courses and programs at the university, particularly practicum courses and internships. The university may find it necessary to evaluate a person’s behavior and background to determine the ability to maintain the standards of professional conduct which are necessary in some disciplines. An evaluation may take into consideration current performance as well as past experiences and actions which could affect the ability to perform in the particular course or program.

**Grade-Point Average (GPA)**

A minimum GPA of 2.00 on OSU cumulative grade-point average is required. See Academic Regulation 25e (p. 21), Institutional Requirements for Baccalaureate Degrees.

**Total Credits**

A minimum 180 earned credits, which must include:

1. **Credits in upper-division courses:** minimum 60 (exclusive of upper-division physical education activity courses).
2. **Credits in each major:** minimum 36, including at least 24 in upper-division courses.

For further information on total credits required, see Academic Regulation 25c (p. 21), Institutional Requirements for Baccalaureate Degrees.

**Academic Standing**

Oregon State University expects students to maintain satisfactory academic progress toward degree completion. At the conclusion of each term, grade-point averages are calculated and academic standings determined for students seeking a baccalaureate degree according to the criteria outlined in the Grades, Regulations, and Records section of this catalog.

**Academic Residence Requirement**

Academic Regulation 25f (p. 21), Academic Residence, Institutional Requirements for Baccalaureate Degrees, states:

- A minimum of 45 of the last 75 credits, or 150 total credits, must be completed while the student is in academic residence at OSU. ‘Academic Residence’ is defined as OSU courses taken as a degree-seeking student of OSU or courses through one of the following approved special programs: Professional degree programs which require that the student enroll in another institution while finishing the bachelor’s degree at OSU or an international study program sponsored by Oregon State University.
- A minimum of 15 upper-division credits used to meet the preceding residency requirement (1) must be taken in each of the student’s majors.
- Credits earned by special examination for credit (AR 23) are not considered in academic residence.

**Other Graduation Requirements**

**BA Degree Requirements**

The bachelor of arts (BA) degree is conferred for broad and liberal education in various approved areas of studies (typically humanities, arts, social science, and sciences). Requirements for the BA degree differ from those for a bachelor of science (BS) degree in the same department. Many departments offer only one or the other of the two baccalaureate degrees. Check departmental curricula for detailed information. The BA degree requires second language proficiency, including American Sign Language (ASL), equivalent to that attained at the end of the second year course in the language as certified by the School of Language, Culture, and Society. See the Academic Regulations for more details.

**Concurrent and Subsequent Baccalaureate Degrees**

Academic Regulation 26 (p. 22)

1. **Concurrent Baccalaureate Degrees:** An undergraduate student may be granted two or more baccalaureate degrees (for example the BA or BS) at the same graduation exercise. The student must:
   a. Complete institutional, college, and departmental requirements for the degree;
   b. Complete, for each additional degree, a minimum of 32 credits more than the requirements of the curriculum requiring the least number of credits; and
   c. Complete each additional 32 credits in residence.
2. **Subsequent Baccalaureate Degree:** A student who has received a previous baccalaureate degree from either OSU or another accredited university may be granted a subsequent baccalaureate degree. The student must:

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1 Some degree programs may require more than 180 credits.
2 Unearned credits are those courses for which a grade of F, N, U, I, W, AUD, or WAU are assigned as a final grade for that course. All other grades are calculated as earned credit.
To become a degree candidate:

- You must be a current OSU student with senior standing
- You must be enrolled in the final course(s) required for your program of study

With Institutional Awarding, undergraduate students no longer need to apply for graduation. Students should meet regularly with their academic advisor to ensure their progress to graduation.

Commencement exercises are held annually in June and attendance is optional. Students who have graduated in the previous summer, fall or winter terms and senior-level students who will graduate in spring, or upcoming summer and fall terms may participate in the June Commencement exercises.

Ecampus students planning to travel to Corvallis for Commencement can contact Ecampus Student Services for additional information.

Additionally, please be aware that all corresponding transcripts are sealed, meaning the academic record cannot be altered, by the Office of the Registrar 90 days after the conferral of a degree. This ensures that the academic course work that reflects the components that substantiated the awarding of the degree is accurately and permanently recorded.

Double Degrees

A student may earn multiple, different degrees simultaneously. Additional degrees may also be earned after your first degree was awarded. The degrees may be offered by the same college, or by different colleges. To earn a double degree, or for each additional degree, a student must complete a minimum of 32 credits above the minimum number of credits needed for one of the degrees. Each degree application is reviewed by the appropriate academic advisor. Advisors complete a separate graduation audit for each of the degrees.

On the student’s academic record, each degree awarded will be recorded as a separate degree with its major, e.g., Bachelor of Science in Mathematics, Bachelor of Arts in English. The student will also receive a separate diploma for each degree awarded (See Academic Regulation 26).

Some double-degree programs — Education (BA, BS, HBA, HBS), Innovation Management (BA, BS, HBA, HBS), Sustainability (BS, HBS), International Studies (BA, HBA) — require that a primary degree be completed in order for the secondary degree to be awarded. When multiple degrees are not dependent on one another, one of the degrees may be awarded even though requirements for the other degree have not yet met. The double degree may be earned concurrently or subsequently. (See Academic Regulation 26.)

Dual (or Multiple) Majors

A student may earn two or more majors within a single degree program (a particular combination of degree, college, and campus, e.g., BA degree from the College of Liberal Arts on the Corvallis campus). It is sometimes possible to complete two or more majors within the minimum number of credits required for a degree, but usually the student must complete additional credits to complete requirements for all of their majors. For this reason, dual (or multiple) majors are obtained within the same college. The advisor must complete one graduation audit that includes all of the majors. The student’s academic record will list one degree with two or more majors, e.g., Bachelor of Science in Mathematics and Chemistry. The student receives one diploma. Dual (or multiple) majors may be obtained concurrently with the completion of the degree, or in

Subsequent Credentials: Minors, Certificates, Options, and Majors

Academic Regulation 27 (p. 23)

1. **Subsequent Minors and Certificates:** A student who has received a previous baccalaureate degree from either OSU or another accredited university or college may be granted a subsequent minor or certificate. The student must:
   a. Complete current requirements for minor or certificate and receive the dean’s certification;
   b. Achieve a minimum of 2.0 OSU cumulative grade-point average on work taken for subsequent credential;
   c. Academic residence: minimum 15 credits in residence.

2. **Subsequent Options and Majors:** A student who has received a previous baccalaureate degree from OSU may be granted a subsequent option or major credential:
   a. Complete current requirements for option or major and receive dean’s approval;
   b. Achieve a minimum of 2.0 OSU cumulative grade-point average on work taken for subsequent credential;
   c. Academic residence: minimum 15 credits in residence.

3. Additional credits necessary for subsequent credentials may be taken prior to or subsequent to the granting of a previous baccalaureate degree.

Requirements for Certificates

See individual certificate programs described in this catalog.

Requirements for Advanced Degrees

For advanced degree requirements see the Graduate School section of this catalog or contact the Graduate School. Students who take courses they wish to apply toward an advanced degree before they have received baccalaureate degrees may have a limited number of credits reserved by petition. Also see Reserving Credits in the Graduate School section.

A graduate student also may obtain baccalaureate degrees from Oregon State University by satisfying the requirements for subsequent degrees.

Undergraduate Graduation via Institutional Awarding

To become a degree candidate:

- You must be a current OSU student with senior standing
- You must be enrolled in the final course(s) required for your program of study

With Institutional Awarding, undergraduate students no longer need to apply for graduation. Students should meet regularly with their academic advisor to ensure their progress to graduation.

Commencement exercises are held annually in June and attendance is optional. Students who have graduated in the previous summer, fall or winter terms and senior-level students who will graduate in spring, or upcoming summer and fall terms may participate in the June Commencement exercises.

Ecampus students planning to travel to Corvallis for Commencement can contact Ecampus Student Services for additional information.

Additionally, please be aware that all corresponding transcripts are sealed, meaning the academic record cannot be altered, by the Office of the Registrar 90 days after the conferral of a degree. This ensures that the academic course work that reflects the components that substantiated the awarding of the degree is accurately and permanently recorded.

Double Degrees

A student may earn multiple, different degrees simultaneously. Additional degrees may also be earned after your first degree was awarded. The degrees may be offered by the same college, or by different colleges. To earn a double degree, or for each additional degree, a student must complete a minimum of 32 credits above the minimum number of credits needed for one of the degrees. Each degree application is reviewed by the appropriate academic advisor. Advisors complete a separate graduation audit for each of the degrees.

On the student’s academic record, each degree awarded will be recorded as a separate degree with its major, e.g., Bachelor of Science in Mathematics, Bachelor of Arts in English. The student will also receive a separate diploma for each degree awarded (See Academic Regulation 26).

Some double-degree programs — Education (BA, BS, HBA, HBS), Innovation Management (BA, BS, HBA, HBS), Sustainability (BS, HBS), International Studies (BA, HBA) — require that a primary degree be completed in order for the secondary degree to be awarded. When multiple degrees are not dependent on one another, one of the degrees may be awarded even though requirements for the other degree have not yet met. The double degree may be earned concurrently or subsequently. (See Academic Regulation 26.)

Dual (or Multiple) Majors

A student may earn two or more majors within a single degree program (a particular combination of degree, college, and campus, e.g., BA degree from the College of Liberal Arts on the Corvallis campus). It is sometimes possible to complete two or more majors within the minimum number of credits required for a degree, but usually the student must complete additional credits to complete requirements for all of their majors. For this reason, dual (or multiple) majors are obtained within the same college. The advisor must complete one graduation audit that includes all of the majors. The student’s academic record will list one degree with two or more majors, e.g., Bachelor of Science in Mathematics and Chemistry. The student receives one diploma. Dual (or multiple) majors may be obtained concurrently with the completion of the degree, or in
some cases may be earned as a credential subsequent to completion of
the degree. (See Academic Regulation 27 (p. 23)).

**Note:** Occasionally, with careful planning, a student can complete two
majors from separate colleges in less than the 212 credits required for
two degrees. When this occurs a student can petition for an exception,
and graduate with two majors from separate colleges. The student must
pick one college as their home college and all majors will be associated
with the home college. The student must have the support of advisors
from both major programs to have their petition considered.

**Honors Degrees**

Students completing the honors college curriculum receive an honors
degree in the college of their major, e.g., HBS Honors Bachelor of Science
in Chemistry, or HBA Honors Bachelor of Arts in English. In some cases it
might be possible for an Honors College student to earn multiple degrees
simultaneously by following the double degrees requirements outlined in
Academic Regulation 26 (p. 22).

Students seeking an honors degree must meet the requirements of the
Honors College in order to receive their degree. Students that complete
an Honors degree will have the honors degree recorded on their academic
record. The student’s diploma will also include the honors degree
designation (e.g., Honors Bachelor of Science, etc.).

**Note:** Honors degrees are not currently available to Ecampus students.

**Degrees with Distinction**

Graduates who have completed at least 90 credits at OSU or sixty upper-
division credits at OSU, and who have an OSU cumulative GPA of 3.5 or
higher, are awarded an OSU degree with distinction as follows:

<table>
<thead>
<tr>
<th>Academic Distinction</th>
<th>OSU GPA Range</th>
<th>Graduation Honor Cord Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cum Laude</td>
<td>3.50-3.69</td>
<td>Orange</td>
</tr>
<tr>
<td>Magna Cum Laude</td>
<td>3.70-3.84</td>
<td>Gold</td>
</tr>
<tr>
<td>Summa Cum Laude</td>
<td>3.85-4.00</td>
<td>White</td>
</tr>
</tbody>
</table>

*These distinctions are noted on diplomas.*

**Undergraduate Research/Arts Fellow Honor Distinction**

Oregon State University recognizes significant engagement and
accomplishment in undergraduate research and the arts by awarding
an honor distinction of ‘Undergraduate Research/Arts Fellow’ to
students of all majors upon completion of a significant research or
creative arts experience under faculty mentorship. ‘Research’ here is
intended to encompass modes of scholarship and inquiry as they are
variously practiced and defined in OSU’s academic disciplines. Students
completing significant creative projects in the arts may receive the
honorary distinction ‘Undergraduate Arts Fellow’ The distinction will
be noted on the student’s transcript, and the student will receive a blue
honor cord to be worn at graduation ceremonies.

To qualify for the Undergraduate Research/Arts Fellow distinction:

1. Students must demonstrate involvement in all major phases of their
project including conception, implementation, and presentation. This
involvement will generally consist of sustained work over multiple
quarters or the summer resulting in an original contribution relative to
the discipline.

2. The project presentation must be to an audience that extends beyond
the immediate research group or creative context, for example
at a public performance, symposium/seminar, the annual CUE
(Celebration of Undergraduate Excellence) at OSU, a professional
meeting, or through publication in a journal.

3. Evidence of the presentation must be submitted with the final
honorary distinction application and deposited into the OSU Scholars
Archive.

4. The faculty mentor must endorse the application, verifying
satisfaction of the criteria described above.

To apply for the distinction, students should complete the OSU
Undergraduate Research/Arts Fellow Honor Distinction Application
(see http://undergraduate.oregonstate.edu/research/transcript-notation/).
Students that complete a thesis in the University Honors College,
International Education, Physics, BioResource Research or the Bioenergy
Minor should submit Form A while form B is to be used for all other
research/creative activities. The Form B which application requires
submission of a detailed description of the project and the student’s
involvement in specific research/creative tasks, a timeline of the
student’s project engagement, details of the public presentation, and the
faculty mentor’s endorsement. Applications are submitted to the head
advisor in the students’ major college, who will sign the application and
transmit to the Director for Undergraduate Research for signature before
it is sent to the Office of the Registrar for processing. Applications may
be submitted at any time during the undergraduate’s career but no later
than three weeks prior to a student’s anticipated graduation date.

**Dissertation/Thesis**

Upon completion and acceptance of a dissertation/thesis at the
conclusion of a program of study, the dissertation/thesis will be recorded
on a student’s transcript, noting the title and term/year that the
dissertation/thesis was accepted by the university.

**Re-Enrolling Students**

Re-enrolling students are reminded that graduation requirements may
have changed. Students are responsible for consulting their college for
changes in their curriculum. If a program has been discontinued, students
cannot expect to continue pursuit of that program. Re-enrolling students
are also reminded that individual retention and re-enrollment standards of
specific colleges may be in effect.

**Oregon Transfer Students**

Oregon community college students entering OSU who have completed
the Associate of Arts Oregon Transfer (AAOT) degree (meeting the block
transfer agreement between Oregon community colleges and Oregon
public universities) will satisfy the lower-division requirements of the
baccalaureate core (except those in the synthesis requirement) and have
junior standing for registration.

When entering OSU, Oregon community college students who have
completed the Associate of Arts Oregon Transfer (AAOT) degree will
have junior standing for registration and will satisfy the lower-division
requirements of the baccalaureate core, except those in the synthesis
requirement. The AAOT degree meets the block transfer agreement
between Oregon community colleges and Oregon public universities.

For more information about how OSU accepts any of the transfer degrees,
call OSU Admissions at 800-291-4192.
Washington Transfer Students

The Direct Transfer Associate degree awarded by any community college in Washington state will satisfy lower-division general (core) requirements at OSU. Students will receive junior level standing with an earned Washington Direct Transfer Associate degree of 90 transferable quarter hours or more. The minimum requirements are: 2.0 GPA on 90 earned quarter hours of transferable credit. OSU will accept a maximum of 12 credits in professional, vocational, and technical courses. You must still meet requirements in your chosen major, minor, or professional program.

For more information about how OSU accepts any of the transfer degrees, call OSU Admissions at 800-291-4192.

California Transfer Students

OSU accepts the Intersegmental General Education Transfer Curriculum (IGETC) to satisfy lower-division (general) core requirements. The IGETC was developed for community college students who plan to transfer to a four-year institution but are undecided about which one and/or undecided about a major. Students interested in the IGETC path to transfer are strongly advised to see an academic advisor prior to enrollment. The minimum requirements are: 36 quarter (24 semester) academically transferable hours, 2.25 cumulative GPA, IGETC Area 1 Group A English requirement (C– or higher grade), IGETC Area 2 Mathematical Concepts requirement (C– or higher grade), and student must be admissible to the last institution they attended.

For more information about how OSU accepts any of the transfer degrees, call OSU Admissions at 800-291-4192.

Transfer Credits

Decisions on transfer courses meeting specific baccalaureate core (general education requirements) will be made by the Office of Admissions with the Faculty Senate and the Office of Academic Programs. Some requirements may be met by advanced placement or international baccalaureate. For more information, contact the Office of Admissions. Articulation tables for baccalaureate core courses can be found online (http://admissions.oregonstate.edu/baccalaureate-core-course-equivalencies/).

Baccalaureate Core Courses

The Baccalaureate Core (Bacc Core) Curriculum represents what the OSU faculty believes is the foundation for students’ further understanding of the modern world. Informed by natural and social sciences, arts, and humanities, the Bacc Core requires students to think critically and creatively, and to synthesize ideas and information when evaluating major societal issues. Importantly, the Bacc Core promotes understanding of interrelationships among disciplines in order to increase students’ capacities as ethical citizens of an ever-changing world.

No single course may be used by a student to satisfy more than one subject area of the Core even though some courses have been approved in more than one area. See Academic Regulation 25(a)(5) (p. 21).

Skill Courses (15)

To support students’ success in all courses, the following first-year Skills courses are to be taken and completed satisfactorily within the first 45 hours of OSU-generated credits:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION (must earn at least C-)</td>
<td>3</td>
</tr>
<tr>
<td>MTH 211</td>
<td>*FUNDATIONS OF ELEMENTARY MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MTH 227</td>
<td>*CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 241</td>
<td>*CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121H</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>WR 211</td>
<td>*WRITING IN BUSINESS</td>
<td>3</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>WR 211</td>
<td>*WRITING IN BUSINESS</td>
<td>3</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
</tbody>
</table>

To prepare for the upper-division Writing Intensive Course in the major, the following Skills course is to be taken and completed satisfactorily within the first 90 hours of OSU-generated credits:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 211</td>
<td>*WRITING IN BUSINESS</td>
<td>3</td>
</tr>
<tr>
<td>WR 222</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
</tbody>
</table>

For transfer students with sophomore standing or above, Writing II and Speech must be completed within the first 45 hours of OSU-generated credits. These requirements apply to all students, whether full time or part time.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR 224</td>
<td>*INTRODUCTION TO FICTION WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 224H</td>
<td>*INTRODUCTION TO FICTION WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 228</td>
<td>*WRITING ABROAD</td>
<td>3</td>
</tr>
<tr>
<td>WR 230</td>
<td>*ESSENTIALS OF ENGLISH GRAMMAR</td>
<td>3</td>
</tr>
<tr>
<td>WR 240</td>
<td>*INTRODUCTION TO NONFICTION WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 241</td>
<td>*INTRODUCTION TO POETRY WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 250</td>
<td>*PODCAST STORYTELLING</td>
<td>3</td>
</tr>
<tr>
<td>WR 301</td>
<td>*PUBLISHING AND EDITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 303</td>
<td>*WRITING FOR THE WEB</td>
<td>3</td>
</tr>
<tr>
<td>WR 323</td>
<td>*ENGLISH COMPOSITION</td>
<td>3</td>
</tr>
<tr>
<td>WR 324</td>
<td>*SHORT STORY WRITING</td>
<td>4</td>
</tr>
<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 327H</td>
<td>*TECHNICAL WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 330</td>
<td>*UNDERSTANDING GRAMMAR</td>
<td>3</td>
</tr>
<tr>
<td>WR 341</td>
<td>*POETRY WRITING</td>
<td>4</td>
</tr>
<tr>
<td>WR 362</td>
<td>*SCIENCE WRITING</td>
<td>3</td>
</tr>
<tr>
<td>WR 362H</td>
<td>*SCIENCE WRITING</td>
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**Biological Science Lecture (3)**

Lectures in this section match with labs from above section. Both the lecture and the corresponding lab must be passed to meet the Biological Science requirement.

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**Cultural Diversity (3)**

No more than two courses (or lecture/lab combinations) from any one department may be used by a student to satisfy the Perspectives category of the core. GEO courses listed under Physical Science are considered to be from a different department than GEO courses listed under any other Perspective category. Choose one Biological Science lecture/lab combination, one Cultural Diversity, one Literature and the Arts, one Physical Science lecture/lab combination, one Social Processes and Institutions, one Western Culture, plus one additional lecture/lab combination from either Physical Science or Biological Science.

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**Physical Science Lecture (4)**

Select 1 or 2 lecture/lab combinations. Combination is assumed (uses the same number) unless indicated in the title. Courses listed as lab must also have the corresponding Physical Science Lecture from below.

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**Physical Science Lecture (4)**

Lectures in this section match with labs from above section. Both the lecture and the corresponding lab must be passed to meet the Physical Science requirement.

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### Synthesis Courses (6)

The two courses used to fulfill the Synthesis requirement may not be in the same department.

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ECAMPUS

Lisa L. Templeton, Associate Provost for Ecampus
4943 The Valley Library
Corvallis, OR 97331-4504
Phone: 541-737-9204 or 800-667-1465
Email: ecampus@oregonstate.edu
Website: https://ecampus.oregonstate.edu (https://ecampus.oregonstate.edu/)

Ecampus – Top-ranked degrees online
As a leader in online education, Oregon State University Ecampus works with OSU faculty to provide access to exceptional learning experiences that transform the lives of students in Oregon and around the world. Thousands of online and distance students enroll in Ecampus’ nationally ranked degree programs and courses each year, all of which are developed by Oregon State University faculty. In the 2018-19 academic year, more than 25,000 OSU students took at least one Ecampus class online.

OSU Ecampus is widely regarded as one of America’s best providers of online education and has been ranked nationally by numerous publications (http://ecampus.oregonstate.edu/online-degrees/promotion/top-ranked.htm) in each of the last nine years. In January 2019, Oregon State’s online bachelor's programs were ranked No. 3 in the nation (https://ecampus.oregonstate.edu/news/2019/oregon-state-online-education-top-10-rankings/) by U.S. News & World Report. It marked the fifth straight year OSU Ecampus was ranked in the top 10. This recognition is based on student engagement; faculty credentials and training; services and technology; and expert opinion.

Students interested in pursuing an Oregon State degree online can choose from more than 60 programs (https://ecampus.oregonstate.edu/online-degrees/), including bachelor’s degrees in business administration; fisheries and wildlife sciences; Spanish; computer science (postbaccalaureate); agricultural sciences; and various liberal arts disciplines. Oregon State’s online and hybrid graduate-level offerings feature four MBA tracks that include organizational leadership and innovation management; master’s programs in engineering management and data analytics; a Master of Natural Resources; and a variety of education programs. Find a complete list of degree and certificate programs here (http://ecampus.oregonstate.edu/). Ecampus delivers more than 1,200 courses online throughout the year. A complete list of classes is available online (http://ecampus.oregonstate.edu/soc/).

Ecampus is also helping expand Oregon State’s presence in the Portland region. Not only do students have access to OSU-signature programs and courses online through Ecampus, but now they can also study in a dynamic, hybrid (online/in-person) learning environment that includes face-to-face interaction with OSU faculty and students as well as on-site support services at the OSU Portland Center at Pioneer Square (https://portland.oregonstate.edu).

Oregon State’s distance learners include full- and part-time students, working and retired professionals, community college students, active-duty and retired military, high school students and individuals who want to further their education with a single college course. Ecampus students and graduates hail from all 50 states and more than 50 countries worldwide.

All curricula for Ecampus courses and degree programs are designed by Oregon State faculty and are held to the same rigorous academic standards as the university’s on-campus classes. OSU is accredited by the Northwest Commission on Colleges and Universities, and all Ecampus students who complete degree requirements receive the same diploma and transcript as campus-based students.

Ecampus works closely with more than 800 OSU faculty members and department heads in order to provide students with enriching educational opportunities. Our current online offerings include courses in more than 100 subjects, from anthropology and chemistry to economics and public health. Oregon State partners with 20 community colleges throughout the state and in Hawaii as a way to help students progress toward a four-year degree. The Degree Partnership Program allows students to take community college and OSU classes concurrently in order to meet the course-load requirement for financial aid and to access other OSU services, including advising. Learn more about taking Ecampus online classes with the Degree Partnership Program (http://partnerships.oregonstate.edu).

Services for Students
Oregon State Ecampus offers a variety of support services (https://ecampus.oregonstate.edu/students/) that meet students’ needs and help them along the path to graduation. Once enrolled online, Ecampus students have access to student services specialists; a team of success coaches, who work one-on-one with learners to identify strategies to support them in achieving their goals; a dedicated Ecampus librarian and 24/7 library support; free online tutoring and remote exam proctoring (https://ecampus.oregonstate.edu/services/proctoring/); OSU’s Disability Access Services; career counseling; and live, around-the-clock technical support on OSU’s learning management system, Canvas.

Ecampus works to create a sense of community for its students by sharing news about OSU faculty and students online (http://ecampus.oregonstate.edu/news/) and in a quarterly newsletter (https://ecampus.oregonstate.edu/news/newsletters/). Ecampus also has a strong following on Facebook (http://facebook.com/osuecampus/), Instagram (http://instagram.com/osuecampus/), Twitter (http://twitter.com/osuecampus/) and LinkedIn (http://linkedin.com/company/oregon-state-ecampus/) where students can engage with fellow classmates, OSU Beavers fans and ask questions of the Ecampus staff.

Ecampus also provides assistance by email, phone or in person to prospective and current students who are interested in taking Oregon State courses online and at a distance.

Services for Faculty
The Ecampus staff provides an array of services for faculty, including course development training workshops, facility coordination and liaison activities with partnering community colleges and universities. Find a complete list of training sessions and workshops online (http://ecampus.oregonstate.edu/faculty/training/).

The Ecampus Faculty Forum is an annual showcase of excellence in online teaching that features interactive, wide-ranging discussions on how Oregon State applies its academic prestige to online education. Held each spring on campus, the event gives faculty the opportunity to hear colleagues discuss innovative teaching methods, best practices and relate their experiences in online course development. More than 250 OSU faculty, administrators and staff attend the event annually.

Ecampus operates a program called QM Online Course Design, which seeks to improve student success in online courses by focusing on continuously improving course design. Using the independent and research-based Quality Matters peer review process, the faculty-driven
QM program examines course design, not the content itself or the teaching.

Having an online course peer reviewed is an ideal way for OSU faculty to receive fresh ideas from colleagues who can offer positive feedback to create more active learning. The Ecampus Course Development and Training team conducts training sessions (http://ecampus.oregonstate.edu/faculty/qm/) year-round, and stipends are awarded when one reviews a peer’s course.

Kathryn Linder, Director
4943 The Valley Library
Corvallis, OR 97331-4504
Phone: 541-737-4629
Email: kathryn.linder@oregonstate.edu
Website: https://ecampus.oregonstate.edu/research

The OSU Ecampus Research Unit (ECRU) makes research actionable through the creation of evidence-based resources related to effective online teaching, learning and program administration toward the fulfillment of the goals of Oregon State’s mission.

Specifically, the ECRU conducts original research and provides resources to encourage faculty research and external grant applications related to online teaching and learning.

Established in 2015, the ECRU regularly publishes the results of national and local studies, and it produces a weekly podcast, “Research in Action (https://ecampus.oregonstate.edu/research/podcast/),” to address topics and issues facing researchers nationwide.

In late 2017, the ECRU created the Online Learning Efficacy Research Database (https://ecampus.oregonstate.edu/research/projects/online-learning-efficacy-research/), a new repository of academic studies that allows users to explore whether the learning outcomes of online education are equivalent to face-to-face environments. As of April 2019, the Online Learning Efficacy Research Database has 240 citations across 74 discrete disciplines from 173 academic journals. The database is updated each month with additions of new studies that fit the database parameters.

The Research Unit houses a competitive award program to fund Oregon State faculty in their online learning research endeavors. Learn more about the Ecampus Research Fellows (ECRF) program (https://ecampus.oregonstate.edu/research/fellows/), its goals, timeline and the materials you’ll need to apply online (http://ecampus.oregonstate.edu/research/fellows/).

Stefanie Buck, Director
Phone: 541-737-7403
Email: stefanie.buck@oregonstate.edu
Website: https://open.oregonstate.edu

To make college more affordable and accessible for students, Ecampus Open Educational Resources works with university faculty to create no-cost and low-cost course materials to be used in classes on-campus and online with OSU Ecampus.

Ecampus Open Educational Resources aims to take advantage of OSU’s national reputation in the field of online learning to establish a competitive open educational resources (OER) program that focuses on reusable digital components. In partnership with OSU Libraries and Press, Ecampus Open Educational Resources partners with faculty to adopt, adapt and author open textbooks that are freely available online to students and faculty at Oregon State and worldwide.

Learn how you and your department can partner with Ecampus Open Educational Resources here (http://open.oregonstate.edu/opportunities/).
Aaron, Wendy 2012, Assistant Professor, College of Education
Degrees:
BA, Univ of California-Santa Cruz, 2001
MA, Univ of California-Los Angeles, 2004
PHD, Univ of Michigan-Ann Arbor, 2011
FINANCIAL AID AND SCHOLARSHIPS

Office of Financial Aid
A218 Kerr Administration Bldg.
Oregon State University
Corvallis, OR 97331
541-737-2241
Email: financial.aid@oregonstate.edu
Website: http://financialaid.oregonstate.edu/

Administration
Keith Raab, Director
Brian Hultgren, Associate Director
Regan Kaplan, Associate Director
Kirk Lind, Associate Director
Bobbi Jo Williams, Office Manager
Lois DeGhetto, Assistant Director
Jordan Hall, Assistant Director
Jacob Logan, Assistant Director
Julie Vanblokland, Assistant Director
Collyn Arnold, Advisor
Michele Lynam, Advisor
Hallie Price, Advisor
Anne Shearer, Advisor
Cassie Smith, Advisor
Rylan Wall, Advisor

The Office of Financial Aid is here to help you invest in your future. It’s a good idea to apply for financial aid at the same time that you apply for admission to OSU. Although we won’t review your financial aid information until after your admission application is filed, you can still apply for financial aid before you have been admitted to OSU. Learn more about your options at OSU by choosing a category below.

Financial aid is based on the premise that you, and in the case of dependent students, your parents are primarily responsible for providing for your educational expenses, and it is intended to supplement student and family contributions toward educational costs. Financial aid comes from many sources, including federal and state government, private organizations, and Oregon State University’s institutional funds. These funds consist of grants, scholarships, federal work study, subsidized loans, unsubsidized loans, and parent loans.

Eligibility/Application Procedures
To be eligible for federal financial aid, a student must:

1. Fill out the Free Application for Federal Student Aid (FAFSA), beginning October 1st using previous year tax data (for example the 2019–2020 application will use 2017 tax information). Parents and students are encouraged to use the IRS data retrieval tool to update their income information and submit it by the OSU priority deadline of February 28. The FAFSA application process allows for the completion of tax information questions from the IRS directly from your return! Follow the prompts while completing the application to authorize this information exchange. Always remember that there is no fee to apply for federal aid.

2. List Oregon State University as a school that you would like your information to be sent to on the FAFSA. Oregon State’s federal school code is 003210.

3. The priority FAFSA application deadline for OSU is February 28th. This date is used to determine eligibility for some need-based aid programs as well as state and institutional funds. Applications received after the priority deadline will still be eligible for federal aid such as the Pell Grant and Direct Loans. Graduate students are not eligible for federal Title IV grants or subsidized loans.

4. Make sure you are eligible to receive financial aid. In order to receive federal funding you must:
   • Have a high school diploma or a General Education Development (GED) certificate, or complete a high school education in a home school setting that is treated as such under state law.
   • Be enrolled or accepted for enrollment in a degree or approved certificate program (e.g., not special admit)
   • Be a U.S. citizen or eligible noncitizen.
   • Have a valid Social Security Number.
   • Register with the Selective Service if required. You can register online (http://www.sss.gov) or you can call 1-847-688-6888. (TTY users can call 1-847-688-2567.)
   • Maintain satisfactory academic progress as defined by Oregon State University once in school.
   • Are not in default on a federal student loan and do not owe money on a federal student grant.
   • The Higher Education Act of 1965 as amended (HEA) suspends aid eligibility for students who have been convicted under federal or state law of the sale or possession of drugs, if the offense occurred during a period of enrollment for which the student was receiving federal student aid (grants, loans, and/or work-study).

5. Apply for admission to Oregon State University. Apply Online. You will not be considered for any financial aid award until you have applied to the university.

What happens AFTER I apply?
Once you have submitted your FAFSA application online you will receive a confirmation of receipt from Federal Student Aid. They will also send you a Student Aid Report that will give you a summary of your application and inform you of any problems you might need to resolve. You should read this report carefully and resolve problems in a timely manner. If you receive notification that something on your FAFSA is missing or incorrect, you can check your financial aid information through MyOSU Financial Aid Information or email the OSU Office of Financial Aid for further information.

Students whose aid application was received by the end of February may expect to receive an initial award letter by approximately April 1. Aid applications are then completed on a rolling basis by date of receipt with award notifications being sent out as files are completed.

You will receive an email or letter once your financial aid award has been completed. You will also be notified if you need to provide further information in order for us to complete your application. All correspondence will be sent to your ONID email account, so be sure to keep your information up to date!

The award notification will show the type and amount of aid available to you for the coming school year. To reserve these funds, the student must
read and accept the award within 30 days. The accepted award indicates the student has read and agrees to the terms of the award as outlined.

Understand Before You Accept

By accepting your award, you are stating that you have read, understand, and accept the Terms and Conditions (http://financialaid.oregonstate.edu/review_termsofconditions/) of your award. As a recipient of financial aid, you must meet certain requirements to maintain financial aid eligibility. The Office of Financial Aid reserves the right to revise a financial aid award during any time of the year if there are changes in your financial aid eligibility. You will be notified through your OSU student email if new requirements have been established or revisions have been made. Your aid eligibility may change based on FAFSA Verification (http://financialaid.oregonstate.edu/verification-faqs/), Satisfactory Academic Progress (http://financialaid.oregonstate.edu/review_satisfactoryacademicprogress/), withdrawing (http://financialaid.oregonstate.edu/receive_withdrawal/), from courses, course participation (http://financialaid.oregonstate.edu/course-participation/), Census Date enrollment (http://financialaid.oregonstate.edu/receive_censusdate/), reaching aid limits (http://financialaid.oregonstate.edu/aid-limits-undergraduates/), and other factors. If you will be less than fulltime (12 credits as an undergraduate/post-bacc or 9 credits as a graduate student) please submit an enrollment revision form (http://financialaid.oregonstate.edu/forms/) to let us know.

Acceptance Deadlines

The acceptance deadlines listed on your award letter do not apply to federal Ford Direct subsidized and unsubsidized loan offers. If you are still deciding how much to accept in Ford loans, you may wait until closer to the start of the term to accept that portion of the aid offer.

Students Who Are Not Yet Admitted

You will not be able to login and accept your aid offer until you have received your Admission's letter and your OSU student ID number. If you have not yet received your ID number and cannot login to MyOSU, you may disregard the acceptance deadline listed on your award letter. Just be sure to accept or decline your aid offer once the Admission's process is complete.

How to Accept Your Aid Offer

To accept your financial aid, login to MyOSU (http://oregonstate.edu/main/online-services/). Log in using your ONID username and password. If you need assistance with this information, you can contact the OSU Computer Help Desk at 541-737-3474.

You can then accept, reject, or revise your Financial Aid Award through MyOSU (http://oregonstate.edu/main/online-services/) by completing the following steps:

- Select the Paying for College tab
- Select Financial Aid Awards
- Select the appropriate year (ex. 2019-2020)
- Answer and submit any relevant questions on the Resources/ Additional Information Tab
- Review your Terms & Conditions by selecting the Terms and Conditions tab
- Then select Accept Award Offer tab
- Click Submit when done
- Go to Student Loans (https://studentaid.gov/) to complete any necessary Entrance Counseling and Master Promissory Notes (these are both required in order to receive federal student loans)
- If you will be enrolled less than fulltime submit an enrollment revision form (http://financialaid.oregonstate.edu/forms)

*You may accept all or a portion of aid awarded to you. You are also not required to accept the maximum loan amount offered to you. To borrow a lesser amount, indicate the total amount of loan you wish to borrow for the academic year. When deciding what amount to accept, please note that your loans must be divided up equally throughout the academic year.

*You are responsible for notifying the OSU Office of Financial Aid in the event that you receive any additional awards from any other source. The OSU Office of Financial Aid and Scholarships will then make any required revisions to your aid package. The receipt of additional aid may result in a reduction or elimination of aid from university-administered programs, even if it has already been paid.

*If you are considered a dependent student, your parents can also apply for a Parent PLUS loan up to the remaining cost of attendance by completing a PLUS loan application and Master Promissory Note available for them through the Federal Student Loans website. (https://studentloans.gov/myDirectLoan/index.action/)

*Important notice about Parent PLUS loan applications: The PLUS loan application will not be available for 2019-2020 until May 01, 2019. If you attempt to apply prior to that date you will be told that OSU does not participate in the program. Rest assured, OSU DOES participate in the Federal Direct Parent PLUS loan program. Applications for parent PLUS loan requires a credit check each time the parent applies for the loan and is only valid for 180 days. Applying too early may cause delays with processing and disbursements. Students can review their file status by logging into their ONID account.

Types of Financial Aid

Federal Programs

Federal Pell Grant

A need-based grant from the federal government intended for high need undergraduate students seeking their first bachelor's degree.

- After the Free Application for Federal Student Aid (FAFSA) is filed, the Department of Education sends you a Student Aid Report (SAR) or an Information Acknowledgement if you filed online. These documents will indicate if you are Pell eligible and it is important to review them for accuracy.
- Based on the Congressional approval of year round Pell, students may now receive up to 150% of their Pell eligibility in a single year. You may be eligible to receive a fulltime Pell Grant for all 4 terms of the academic year. Terms in which a student is attending less than halftime (fewer than 6 credit hours) may not be counted towards this additional eligibility.
- Students may receive the Pell grant for a maximum of 18 terms/12 semesters. Utilizing year round Pell will use this lifetime eligibility (https://studentaid.ed.gov/sa/types/grants-scholarships/pell/calculate-eligibility/) more quickly.

Federal Supplemental Educational Opportunity Grant (FSEOG)

- A need-based grant from the federal government intended for high need undergraduate students seeking their first bachelor's degree.
• Administered by the OSU Office of Financial Aid. Funds are limited and eligibility is based in part by meeting the OSU priority FAFSA submission deadline of February 28.

Federal College Work-Study Program (FWS)

The Federal College Work-Study Program (FWS) program helps provide part-time jobs for students with financial need to help them pay for their education.

• The program is administered by the OSU Office of Financial Aid. Funds are limited and eligibility is based on need and in part by meeting the OSU priority FAFSA submission deadline of February 28.
• Being awarded FWS funds allows you to apply for jobs that specifically have the Work-Study designation. If you are awarded FWS and secure a Work-Study job, you will be paid monthly for hours worked.
• The amount of FWS indicated on your award is the maximum amount you may earn for the academic year. Funds are paid monthly on the basis of hours worked in the pay period not to exceed 20 hours per week.
• Students not awarded FWS may still apply for jobs both on and off campus.

Please review our Work-Study Page (https://financialaid.oregonstate.edu/Work_Study/) for more detailed information

LOANS

Loans: Federal Aid THAT DOES HAVE TO BE REPAID

Federal Loan Basics

• Federal Student Loans are aid that must be repaid.
• You must file a FAFSA each year to receive a federal loan offer.
• On Subsidized Loans, the U.S. Department of Education pays the interest while you are attending school at least half time.
• On Unsubsidized Loans, you are responsible for paying the interest during times of deferment.
• Parent Plus and Graduate Plus loans require a credit check and separate application each year.
• Minimum halftime enrollment is required each term to receive federal loans.
• Find interest rate and origination fees for all federal loans online at https://studentaid.ed.gov/sa/types/loans/interest-rates/.
• There are yearly, aggregate, and timeframe maximums for federal loans.
• The Perkins Loan program has not been extended beyond the 2017-2018 aid year. Repayment and deferment options are handled by the OSU Business Affairs Student Loan Office (https://fa.oregonstate.edu/business-affairs/perkins/). Please see our Perkins disclosure page (https://financialaid.oregonstate.edu/federal-perkins-loan-program-extension-act-additional-disclosures/) if you have an existing Perkins loan.

Types of Federal Loans

Subsidized Federal Ford Direct Student Loan

• Subsidized means the U.S. Department of Education pays the interest (https://studentaid.ed.gov/sa/types/loans/interest-rates/) while you are attending school at least half time.

• Awarded to undergraduate students with financial need.
• The amount you are awarded is determined by your financial need and class rank.
• If you have not received a Federal Ford Direct Loan at OSU in the past, you must complete Entrance Counseling and a Master Promissory Note online at StudentLoans.gov (https://studentloans.gov/myDirectLoan/index.action/).
• Repayment begins 6 months after graduation or dropping below half time enrollment
• Has yearly, aggregate, and timeframe limits.

Unsubsidized Federal Ford Direct Student Loan

• Unsubsidized means you are responsible for paying the interest (https://studentaid.ed.gov/sa/types/loans/interest-rates/) during times of deferment.
• Awarded to undergraduate and graduate students.
• The amount you are awarded is determined by your class rank and dependency status.
• If you have not received a Federal Ford Direct Loan at OSU in the past, you must complete Entrance Counseling and a Master Promissory Note online at StudentLoans.gov (https://studentloans.gov/myDirectLoan/index.action/).
• If you are a dependent student and your parent has been credit denied for the Parent Plus loan this year, you may submit a Student Loan Revision form to request an increase in the Ford Direct unsubsidized student loan.
• Repayment begins 6 months after graduation or dropping below half time enrollment.
• Has yearly and aggregate limits.

Parent PLUS Federal Loan

• The Federal Direct Parent PLUS Loan is a credit based loan borrowed by the parent on behalf of a dependent undergraduate or post-bacc student for educational expenses.
• Has no yearly or aggregate limits but amounts must fit into the expected cost of attendance.
• The loan is unsubsidized meaning you are responsible for paying the interest (https://studentaid.ed.gov/sa/types/loans/interest-rates/) during times of deferment.
• The parent borrower must complete a Direct PLUS Loan Application and Master Promissory Note (MPN) online at StudentLoans.gov.
• The credit check, run as part of the application, is only valid for 180 days. Do not complete the application more than 180 days before the start of the term, or before May of the respective year if attending summer term.

*For applicants who have been determined to have an adverse credit history, but qualify for a Direct Parent PLUS loan by documenting extenuating circumstances or obtaining an endorser must complete the PLUS Counseling online at StudentLoans.gov (https://studentloans.gov/myDirectLoan/index.action/). Students can review their file status by logging into their MyOSU (https://main.oregonstate.edu/) account.

*If a Parent Plus loan has been credit denied for this year, the student may submit a Student Loan Revision form (https://financialaid.oregonstate.edu/forms/) to request an increase in the Ford Direct unsubsidized student loan.
Graduate PLUS Federal Loan

- The Federal Direct Grad PLUS Loan is a credit based loan borrowed by graduate students to assist with educational expenses.
- Has no yearly or aggregate limits but amounts must fit into the expected cost of attendance.
- The loan is unsubsidized meaning you are responsible for paying the interest during times of deferment.
- You must complete a Direct PLUS Loan Application and Master Promissory Note (MPN) and Entrance Counseling online at StudentLoans.gov (https://studentloans.gov/myDirectLoan/index.action/).
- The credit check, run as part of the application, is only valid for 180 days. Do not complete the application more than 180 days before the start of the term, or before May of the respective year if attending summer term.

*For applicants who have been determined to have an adverse credit history, but qualify for a Direct Graduate PLUS loan by documenting extenuating circumstances or obtaining an endorser must complete the PLUS Counseling online at StudentLoans.gov (https://studentloans.gov/myDirectLoan/index.action/).

FEDERAL LOAN LIMITS

Dependent Undergraduate Ford Direct Student Loan Maximum Per Year:

- $5,500 freshman ($3,500 of that may be subsidized if eligible)
- $6,500 sophomore ($4,500 of that may be subsidized if eligible)
- $7,500 junior/senior ($5,500 of that may be subsidized if eligible)

* If a Parent Plus loan has been credit denied for this year, the student may submit a Student Loan Revision form to request an increase in the Ford Direct unsubsidized student loan. The maximum increase is $4,000 for fresh/soph and $5,000 for jr/sr.

Dependent Undergraduate Ford Direct Student Loan Aggregate Maximum (Limit for all years combined):

- $31,000 Ford Direct Subsidized and Unsubsidized Loans Combined (no more than $23,000 of that may be subsidized)

* If a Parent Plus loan has been credit denied for this year, the student may submit a Student Loan Revision form to request an increase in the Ford Direct unsubsidized student loan. In this case the aggregate maximum increases to $57,500.

* The credit hour maximum timeframe (MTF) is an additional limitation beyond the federal aggregate aid maximums. More information about the MTF may be found on the Satisfactory Academic Progress section of our website.

* The Subsidized Federal Direct Ford Loan is need-based with the government paying the interest on the loan while the student is enrolled. Effective July 1, 2013 there will be a limit on the amount of time that a student is allowed to borrow subsidized loan funds which will be tied to their program length. Students that exceed 150% of their program length will no longer be eligible to receive subsidized loan funds, regardless of any extensions granted based on the Satisfactory Academic Progress appeal process through the Office of Financial Aid. Find more details on the federal loan webpage.

Independent Undergraduate Ford Direct Student Loan Maximum Per Year:

- $9,500 freshman ($3,500 of that may be subsidized if eligible)
- $10,500 sophomore ($4,500 of that may be subsidized if eligible)
- $12,500 junior/senior ($5,500 of that may be subsidized if eligible)

Independent Undergraduate Ford Direct Student Loan Aggregate Maximum (Limit for all years combined):

- $57,500 Ford Direct Subsidized and Unsubsidized Loans Combined (no more than $23,000 of that may be subsidized)

* The credit hour maximum timeframe (MTF) is an additional limitation beyond the federal aggregate aid maximums. More information about the MTF may be found on the Satisfactory Academic Progress section of our website.

* The Subsidized Federal Direct Ford Loan is need-based with the government paying the interest on the loan while the student is enrolled. Effective July 1, 2013 there will be a limit on the amount of time that a student is allowed to borrow subsidized loan funds which will be tied to their program length. Students that exceed 150% of their program length will no longer be eligible to receive subsidized loan funds, regardless of any extensions granted based on the Satisfactory Academic Progress appeal process through the Office of Financial Aid.

Graduate Ford Direct Loan Limits

Graduate Ford Direct Student Loan Maximum Per Year:

- $20,500 (unless seeking certain medical or professional degrees)

Graduate Ford Direct Student Loan Aggregate Maximum (Limit for all years of undergraduate and graduate work combined):

- $138,500 (unless seeking certain medical or professional degrees)

* The credit hour maximum timeframe (MTF) is an additional limitation beyond the federal aggregate aid maximums. More information about the MTF may be found on the Satisfactory Academic Progress section of our website.

Campus Scholarships

These limited merit and need based scholarships are administered by the Office of Scholarships and the Office of Financial Aid. Incoming students are considered based on completion of the scholarship portion of the admissions application. Eligibility is limited to students who have completed fewer than 12 terms and submit the application for Admission by February 1. Recipients must be enrolled full-time and are notified of their awards in writing. Criteria is available on the Scholarships website (https://scholarships.oregonstate.edu/prospective-student-scholarships/).

Departmental Awards

Each department on campus administers their own awards. Contact the department or donor directly for specific information regarding the award. For a searchable database of scholarships, visit ScholarDollars (https://scholarships.oregonstate.edu/scholardollars/).

Private Awards
These awards come from outside donors and can affect your financial aid package. Outside scholarship checks should be mailed to: Student Accounts, Oregon State University, PO Box 1086, Corvallis, OR 97339. If you have not already submitted notification to the Financial Aid Office regarding your outside scholarships, please submit the Reporting Additional Sources of Assistance form located on the Financial Aid Forms page.

State of Oregon Opportunity Grant

The Opportunity Grant is a state grant administered by the Office of Student Access and Completion (OSAC) and awarded to undergraduate Oregon residents based on need and allowable funding. Students must complete the FAFSA (https://fafsa.ed.gov/) or ORSAA (https://oregonstudentaid.gov/fafsa-orsaa.aspx) each year in order to be considered. Twelve terms of eligibility are possible. This grant is not available during summer term.

OSAC Scholarship Application

Start your OSAC Scholarship Application (https://app.oregonstudentaid.gov/), final deadline is March 1 of each year. In the event that it falls on a weekend or holiday, the deadline will automatically be extended to 5:00 p.m. (PST) of the following business day.

Oregon Student Child Care Grant

You may apply for the Oregon Student Child Care Grant (https://app.oregonstudentaid.gov/) if you are an Oregon student seeking financial support for college students with children in daycare.

Other Programs

Private Supplemental/Alternative Loan

Students needing additional funding for school, whose aid package has not fully met their cost of attendance, may opt to apply for funding through a private lending agency. These loans have a variable interest rate, and a credit check must be done on all applicants. OSU cannot recommend lenders for private/alternative loans. More information may be found on our webpage (http://financialaid.oregonstate.edu/review_aidtypes_private_loan/).

Graduate Students

Based on the FAFSA application, graduate degree seeking students may be eligible to receive Unsubsidized Direct Loans. The annual loan maximum for non-professional students is $20,500 per academic year. The aggregate borrowing limit is $138,500. This includes all Federal Direct Subsidized and Unsubsidized loans borrowed for undergraduate and graduate study. Students must be enrolled at least half time (5 credits) and repayment begins six months after graduation, withdrawal, or if you drop below half-time enrollment. Interest rate and origination fee information may be found on the FSA webpage (https://studentaid.ed.gov/sa/types/loans/interest-rates/). For more information, visit our graduate student webpage (http://financialaid.oregonstate.edu/graduate-student-aid/).

In addition to Unsubsidized Direct Loan, Graduate Students can apply for a credit based Graduate PLUS loan at studentloans.gov (https://studentloans.gov/myDirectLoan/index.action/). If credit approved for this loan, graduate students may accept up to their remaining cost of attendance for that year.

Before you can receive a PLUS Loan, your school must have determined your maximum eligibility for Direct Unsubsidized Stafford Loans.

In addition to these Federal Aid Programs, the Graduate School offers additional information on Assistantship, Grant and Scholarship Opportunities on their webpage (http://gradschool.oregonstate.edu/).

Receipt of Aid Funds

OSU Office of Business Affairs is responsible for disbursing refunds from student accounts once financial aid has been applied. You must be registered and have your tuition and fees billed to your account for financial aid to be applied. Aid funds are never made available in advance. Textbooks cannot be charged to a student's account. It is assumed that the student will purchase textbooks out-of-pocket and use any refund to ‘reimburse’ themselves for the costs. If a credit balance remains on your student account after current university charges are paid, you will be issued a refund. Federal Work-Study earnings are paid by payroll check to you each month for hours worked. You may receive a refund and still have an outstanding balance on your account. For more information about your bill or refund, visit the Business Affairs website.

Delayed Disbursements

There are several ways in which your aid may be delayed. Here are the most common reasons:

• You may be required to complete Entrance Counseling and sign a Master Promissory Note (MPN) for your Ford Direct Loans. You would have been notified of these requirements via an email to your ONID email account.
• Dropping classes (below 12 for undergraduates, 9 for graduates). All students are assumed to be full-time unless they notify Financial Aid in writing that they will be less. If you are not enrolled at full-time and have not notified us, your aid will not disburse.
• Registering late for classes.
• Being waitlisted for classes. These classes do not count toward your enrollment level until you are actually enrolled in them.
•Having unsatisfied requirements with your financial aid file. Check your status through MyOSU/Financial Aid/My Eligibility.

You are responsible for managing your Financial Aid experience, so be sure to check MyOSU frequently and review any emails you receive from us as they may include requests for additional information or action.

Requesting Changes

It is understood that you want as much grant and scholarship money as possible. When you are awarded your financial aid, your award will reflect your eligibility for available grant aid. When accepting your award, you may always request a lesser loan amount. Please note that loan funds are divided into equal disbursements, based on your enrollment at OSU within the given year. You may replace your Federal Work-Study funds with a Direct Ford loan, however this is dependent upon your loan eligibility. In addition, if you initially decline loan funds but find later that you in fact need them, you may also request that the loan be reinstated up to the total of your original offer. Please request any changes in writing by submitting a Loan Revision Request form to the financial aid office. Be aware that not all budget requests can be accommodated.

Additional Costs

In certain instances, your cost of attendance may be adjusted to include other allowable costs incurred to meet your educational
needs. Requests are reviewed on a case-by-case basis to determine approval. Documentation of the additional expense must be included for consideration. If approved, additional expenses are usually funded with 'self-help' assistance in the form of loans. Adjustments are not made for consumer debts, car payments, or private school tuition.

Adjustments may include, but are not limited to:

- Medical or dental cost not covered by insurance
- Computer expense (one time allowance)
- Child care cost for children 12 and under
- Commuting costs from outside the Corvallis area
- Costs related to students with disabilities
- Study abroad program fees

Parent or Student Expected Contributions (EFC)

The information you reported on your FAFSA is used to calculate a number called the Expected Family Contribution (EFC). The EFC is not the amount of money that your family must provide. The school uses the EFC to determine the amount of your federal grants, loans, or work-study awards for which you may be eligible.

Changes in Your Situation

Financial Aid offices may consider special or unusual circumstances that impact your family situation. Please contact us with any questions you might have regarding your eligibility for a review.

Renewing Aid

You must apply for financial aid every year by submitting a FAFSA application. Applications must be received before February 28 at the central processor to be considered for priority funding. You may apply for aid online after October 1st for the following academic year.

Dropping Courses and the Census Date

Dropping courses impacts your financial aid in several ways. Aid is based on your enrollment level on the Census Date (https://financialaid.oregonstate.edu/receive_censusdate/) of each term. For undergraduates, full-time status is 12 or more credits, 3/4 time is 9-11 credits, 1/2 time is 6-8 credits, and less than halftime is 1-5 credits. Less than fulltime enrollment may affect your financial aid eligibility. Students enrolled less than halftime are not eligible to receive most types of aid including federal student loans. If you plan on being less than fulltime you must submit an enrollment revision form (https://financialaid.oregonstate.edu/forms/) to the Office of Financial Aid.

Financial aid eligibility each term is based on your level of enrollment on the Census Date (https://financialaid.oregonstate.edu/receive_censusdate/). On this date, budgets and financial aid are adjusted and locked based on your enrollment level at that time. If your aid was paid at the full-time amount and you are less than fulltime on the Census Date, your budget will be revised and your aid may need to be reduced to reflect your Census Date enrollment. This revision may create a new bill on your OSU student billing account.

Dropping or withdrawing from courses after the census date, may also impact your financial aid eligibility for the current and future terms. Withdrawing (https://financialaid.oregonstate.edu/receive_withdrawal/) from all courses, failing to complete courses (unofficially withdrawing), or not participating (https://financialaid.oregonstate.edu/course-participation/) in courses, may result in the partial or full loss of aid eligibility for that term. Future term eligibility will depend on continuing to make Satisfactory Academic Progress (https://financialaid.oregonstate.edu/review_satisfactoryacademicprogress/).

If you will be less than halftime, be sure to stay in contact with your loan servicer. Halftime enrollment is required in order to keep federal loans in the "in school deferment status". Find more on our Loan Repayment page (https://financialaid.oregonstate.edu/loan-repayment/).

Short Sessions (Courses in Modules)

If a student is enrolled in sessions that do not span the entire 11 week term (modules) there are special rules that apply. You are paid federal financial aid based on all of the modules (entire payment period) you are registered for at the time of disbursement. If you do not complete all of those modules a return of federal funds may be required.

Be sure to monitor your OSU student email carefully. If you drop, withdraw from, or do not fully complete your current modules, you will be considered withdrawn from the term even if you are still enrolled in a future modules. In this case you may be emailed a request to complete a survey verifying your intent to participate in future modules. If you do not complete this survey, a return of federal aid may be required. See our Withdrawal Page (https://financialaid.oregonstate.edu/receive_withdrawal/) under “How is the return of federal aid calculation different for short sessions/modules?” for more detailed information on how drops, withdrawals, and non-completion can impact your aid.

The Pell Grant must always be adjusted to exclude payments for any course you do not participate in. If you drop a course before that course session began, we are required to reverse any Pell Grant payments made for that course. Reversed Pell will be returned to the Department of Education. This reversal of aid may create a new bill on your OSU student billing account.

What Happens If I Withdraw?

Students who withdraw from the university after the start of the term must complete a Withdrawal Form through the (https://registrar.oregonstate.edu/withdraw-term/)/Registrar’s Office (http://oregonstate.edu/registrar/) and notify the Office of Financial Aid of their current and future term enrollment plans with an Enrollment Revision Form (https://financialaid.oregonstate.edu/forms/). If financial aid funds were used to pay tuition and fees any refundable tuition amount is returned to the appropriate financial aid sources (refer to the tuition/fee refund schedule on the Business Affairs page (https://fa.oregonstate.edu/business-affairs/tuition-reduction-schedule/#text)).

OSU is required to calculate the Return of Title IV financial aid funds for students that officially withdraw (complete the withdrawal process) or unofficially withdraw (ceasing course participation) during the academic term. Students who do not intend to complete the term for which they are enrolled, should follow the official withdrawal process as outlined by university regulations.

The information below is a brief summary of the process that takes place when a student withdraws from all courses or fails to receive a passing grade for a given term. The policies and procedures listed are subject to change without advance notice based on changes in federal or institutional policies. This is not an exhaustive list of the rules pertaining to the Return of Title IV funds. Further guidance regarding these policies
What Happens If I Withdraw From or Do Not Complete A Course

The impact of a partial withdrawal (official or unofficial) will vary greatly by student status, type of aid awarded, participation, and other factors. Students who plan to drop, withdraw, or not complete one or more courses, should contact the Office of Financial Aid for a personalized evaluation of how a partial withdrawal will impact their current and future aid eligibility.

Below are some important things to keep in mind about how a partial withdrawal may impact current and future term federal aid eligibility:

Current Term

The Census Date (https://financialaid.oregonstate.edu/census-date/) is the point at which your enrollment is locked for financial aid purposes. During the fall, winter, and spring terms, the census coincides with the last day you can drop classes for a full tuition refund at OSU. At this point in the term, credit hours are locked and financial aid for the term is adjusted to reflect the student's official enrolled credits. In a standard length term, a partial withdrawal after census does not impact current term aid eligibility in most cases.

Terms when a student is taking short session/modular courses are treated differently. You may be considered completely withdrawn from the term even if you have successfully completed earlier modules or are enrolled in future modules. Review the “How is the return of federal aid calculation different for short sessions/modules?” section (drop down on the lower part of the withdrawal page) for further information.

Future Term

To maintain federal aid eligibility a student must make Satisfactory Academic Progress. This means meeting certain criteria for OSU GPA, Pace of completion, and consistency of completion. The Pace of completion percentage is calculated by dividing the number of credits successfully completed by the number attempted. When you withdraw from or do not successfully complete a course, your Pace of completion goes down. For example, if you complete 5 out of 10 credits your Pace of completion is 50%. If you do not maintain a pace of at least 67% overall Pace, federal aid eligibility can be lost. Find out more on our Satisfactory Academic Progress page (https://financialaid.oregonstate.edu/renewing-your-aid/).

Students are expected to understand the terms, conditions, and requirements that relate to their financial aid award. Additional information on retaining full financial aid eligibility may be found on the Financial Aid webpages:

- Satisfactory Academic Progress (https://financialaid.oregonstate.edu/satisfactory-academic-progress/)
- Terms and Conditions (https://financialaid.oregonstate.edu/terms-conditions/)
- Renewing Your Aid (https://financialaid.oregonstate.edu/renewing-your-aid/)
- Census Date (https://financialaid.oregonstate.edu/census-date/)
- Course Participation (https://financialaid.oregonstate.edu/course-participation/)

What Happens If I Do Not Complete Any Courses in a Term?

Federal financial aid is awarded based on the expectation that a student will participate in all of their courses through the last day of the term. When a student does not complete any courses, the Office of Financial Aid is required to review their eligibility for aid that has been or could be disbursed. A return of Title IV (federal aid) calculation must be completed for any student who did not complete the term. A student is considered to have earned the full amount of disbursed federal aid if they participated in all courses and completed more than 60% of the term. In cases where full participation and more than 60% term completion cannot be verified, a return of federal Title IV and other types of aid may be required.

In most cases, the percent completion date used for the Return of Title IV funds calculation will either be based on the date of withdrawal or the last date of participation reported by instructors. In the case of an official withdrawal that is processed during the term, the calculation is usually completed based on the date of official withdrawal reported by the Registrar’s Office. A student is considered unofficially withdrawn if they fail to receive any passing grades in a given term. In the case of an unofficial withdrawal, the date used will be based on participation dates reported by OSU and partner school instructors. The last date of participation may also be used for the Return of Title IV funds calculation instead of the withdrawal date in cases where the participation date is considered more accurate.

In addition to a current term return of federal funds, future term aid eligibility may be impacted by a full withdrawal. Students are expected to understand the terms, conditions, and requirements that relate to their financial aid award. Additional information on retaining full financial aid eligibility may be found on these Financial Aid webpages:

- Satisfactory Academic Progress (https://financialaid.oregonstate.edu/satisfactory-academic-progress/)
- Terms and Conditions (https://financialaid.oregonstate.edu/terms-conditions/)
- Renewing Your Aid (https://financialaid.oregonstate.edu/renewing-your-aid/)

How Does a Return of Federal Aid Calculation Work

The Return of Title IV Funds calculation determines the amount of federal funds that must be returned by the institution as well as how much aid the student must return for the period of non-enrollment. For students who completed 60% or less of the term, a pro-rated schedule is used to determine the amount of aid that must to be returned. That means the percentage of aid that a student is eligible to retain for the term is based on the percentage of the term that they completed. If a return of aid amount is calculated, the funds must be repaid to the financial aid programs in the following order:

- Federal Direct Unsubsidized Ford Loan
- Federal Direct Ford Loans
- Federal Perkins Loan
- Federal Direct PLUS Loan
- Federal Pell Grant
- FSEOG
The amount of federal aid that you must repay is determined via the Federal Formula for Return of Title IV funds (Section 484B of the Higher Education Act). This law also specifies the order in which funds are to be returned to the financial aid programs from which they were awarded, starting with loan programs.

You may be required to make a repayment when cash has been disbursed from financial aid funds, in excess of the amount of aid that you earned (based on the date of your total withdrawal or last date of participation) during the term. The amount of Title IV aid earned is determined by multiplying the total Title IV aid (other than FWS) for which you qualified by the percentage of time during the term that you were enrolled.

If less aid was disbursed than was earned, you may submit a request to receive a late disbursement for the difference.

If more aid was disbursed than was earned, the amount of Title IV aid that you must return (i.e. not earned) is determined by subtracting the earned amount from the amount actually disbursed.

The responsibility for returning unearned Title IV aid is shared between the university and you. It is allocated according to the portion of disbursed aid that could have been used to cover university charges, and the portion that could have been disbursed directly to you once those charges were covered. OSU will distribute the unearned aid back to the Title IV programs, as specified by law. The return of funds will be completed within 45 days of the date the determination of the withdrawal. You will receive a letter by postal mail if the Return of Title IV Funds calculation was completed and a return of funds was required. If the Return of Title IV Funds calculation was not required but funds needed to be returned for other reasons, you will be notified through your OSU student (ONID) email.

You will be billed for the amount that you owe to the Title IV programs, as well as any amount due to the university, as a result of Title IV funds that were returned that would have been used to cover university charges.

Withdrawing (official or unofficially) from a term may also impact a student’s eligibility for financial aid in future terms. Students should familiarize themselves with the Satisfactory Academic Progress requirements for federal aid and should contact the Office of Financial Aid regarding how federal and other types of aid may be impacted.

### How is the Return of Federal Aid Calculation Different for Short Sessions/Modules

OSU has multiple sessions that do not span the entire length of our usual 11 week term (mostly during summer). These shorter sessions are considered “modules” for federal financial aid purposes and these modules have unique rules that may impact federal aid eligibility.

A student may be considered withdrawn if they do not complete all days in the payment period they were scheduled to complete. For a student enrolled in sessions not spanning a full 11 week term, the payment period they are expected to complete is made up of the combined calendars for all sessions that they were paid aid on.

If a student drops courses in a future session while they are enrolled in a current session, they are not considered withdrawn from the term. An aid adjustment may be required for those drops but a Return of Title IV calculation would not be required.

A student who drops, withdraws from, or does not complete their current sessions, will be considered withdrawn from the term even if they are still enrolled in a future session. Students must monitor their student email for the Summer Survey request. Students will be required to submit that survey in order to verify their intent to participate in those future sessions. If this intent to participate survey is not received, a Return of Title IV Calculation must be done even if the student has successfully completed other coursework for the term and is enrolled in future sessions.

For courses in modules, the calendar used in the Return of Title IV funds calculation includes all days within the period that the student was scheduled to complete (including those completed by the student) prior to ceasing attendance. For example, a student enrolls in 2 summer sessions (session 2 spans 6/25-7/20 and session 5 spans 8/20-9/7). If they drop session 5 (a session that has not yet started) before they withdraw from session 2, we calculate using only the session 2 calendar. If they were still enrolled in session 5 when they withdraw from session 2, we calculate on both calendars combined. Calculating on the combined calendars may reduce the completion percentage which may increase the amount of funds that needs to be returned.

Below are 3 examples of how drops, withdrawals, and non-completion can impact aid in modules:

**EX 1.** Mary enrolls in 2 summer sessions (session 2 spans 6/25-7/20 and session 5 spans 8/20-9/7). She withdraws from session 2 on 6/1 and remains enrolled in session 5. In this case Mary will be considered withdrawn from the term if she does not complete the summer survey to confirm her intent to attend session 5. As long as Mary submits that survey and successfully completes session 5, a Return of Title IV calculation is not required.

**EX 2.** Joe enrolls in 2 summer sessions (session 2 spans 6/25-7/20 and session 5 spans 8/20-9/7). He receives a B grade in his session 2 course but, after that course had ended, decides he no longer wants to take the course in session 5. Joe had been paid federal aid with the expectation that he would complete the entire payment period that spanned both sessions. Because he decided not to complete session 5 after session 2 had ended, a Return of Title IV calculation is required and he may end up owing aid money back for the term.

**EX 3.** Barry enrolls in 2 summer sessions (session 2 spans 6/25-7/20 and session 5 spans 8/20-9/7). While enrolled his session 2 course he decides he no longer wants to take the course in session 5 and drops that course. Barry had been paid federal aid with the expectation that he would complete the entire payment period that spanned both sessions. Because he dropped his session 5 course while he was still attending session 2, a Return of Title IV Calculation is not required but his Pell Grant is still reduced for the session 5 course he never attended.

### What if I am a Degree Partnership Program Student Who Withdraws from a Fails Partner School Courses

In cases of official and unofficial withdrawal an instructor reported last date of participation (https://financialaid.oregonstate.edu/course-participation/) may be required to determine a student’s aid eligibility. The OSU Office of Financial Aid is not able to contact partner school instructors directly to obtain this information. After a term has ended DPP students may be contacted with instructions on how to complete this participation verification process. Due to the time sensitive nature of this process, it is very important for DPP students to check their OSU Student (ONID) email regularly to look for these financial aid notifications. Failure to verify participation may result in the reduction or full loss of financial aid eligibility for the term.
Student Responsibilities

Reporting Changes
Your financial aid is based on the information submitted to our office for the current academic year in which you requested aid. To keep your file current and accurate, you are required to report the changes to the OSU Office of Financial Aid. You should expect a revision of your award in most cases. Reasons for changes can include but are not limited to:

- Additional financial assistance: scholarships, grants, loans, fee waivers, Tribal Assistance, tuition/book support, social security benefits or any other monetary award not reported previously.
- Receipt of graduate teaching or research assistantship, and/or fellowship.
- Receipt of resident advisor position.
- Changes in enrollment hours and/or withdrawal from the university.
- Changes in residency status for tuition purposes.
- Change in course load if below full time.

Entrance and Exit Interview
All Federal Direct Ford loan recipients are required to complete an entrance interview prior to receiving the first disbursement of their loan proceeds. They are also required to complete an exit interview during their last term of attendance. (For further information, visit studentloans.gov (https://studentloans.gov/myDirectLoan/index.action)).

Appeals
Students who are not satisfied with a decision of a financial aid staff member may appeal that decision, in writing, and then in person to the following staff in the order indicated: the director of Financial Aid, and then the Financial Aid Appeals Subcommittee. The decision of the director and/or Financial Aid Appeals Subcommittee will be considered final.

Student Enrollment Levels
Federal financial aid eligibility and deferment of student loans are affected by enrollment levels. Summer enrollment levels are the same as other terms.

Undergraduate
Full Time: 12 or more credits in a term
Three Quarter Time: 9 to 11 credits in a term
Half Time: 6 to 8 credits in a term

Graduate
Full Time: 9 or more credits in a term
Half Time: 5 to 8 credits in a term

OSU ScholarDollars
Starting November 1st, OSU students may use OSU ScholarDollars to submit an application for the nearly $50 million in campus-based scholarship funding available for the 2019-2020 academic year. By submitting one application, you will be considered for over 1,600 OSU scholarship opportunities!

Newly-admitted and continuing OSU students are eligible to apply for scholarships through OSU ScholarDollars. Students must have been admitted to OSU and have an active ONID account to be able to log into the system and submit an application.

Submit your OSU ScholarDollars application between November 1, 2018 and February 1, 2019 to maximize the number of scholarships for which you will be considered. Most OSU scholarships have a deadline on or after February 15, 2019, but specific deadlines may vary.

Merit-based, need-based, and activity-based OSU scholarships are available, and OSU ScholarDollars also offers a searchable database of external scholarships.

For further information about ScholarDollars, please email the Scholarship Office at scholarship.office@oregonstate.edu.

- OSU ScholarDollars (https://scholarships.oregonstate.edu/scholardollars/)
GLOSSARY & CATALOG DEFINITIONS

The following terms are used throughout the Academic Catalog.

**Academic Probation:** Students who have completed two or more terms at OSU and have an OSU cumulative GPA below 2.0 will be placed on probation. Students who attain a cumulative GPA of 2.0 or better are removed from academic probation.

**Academic Suspension:** Students who are on probation and have a subsequent term GPA of less that 2.0 will be placed on suspension. A student who has been suspended from OSU is prohibited from enrolling in classes, and must fulfill specified criteria before being re-admitted to the university (see Academic Regulation 22 (https://catalog.oregonstate.edu/regulations/). Academic suspension is recorded on the student’s academic record.

**Academic Warning:** Students with a term GPA below 2.0 will be placed on academic warning.

**Academic Year:** The time period containing the academic terms fall, winter, and spring (currently September through June). When summer term is considered as part of an academic year, or when it is considered as part of the Banner Student Information Systems (SIS), summer term is the first term of the academic year.

**Add/Drop:** Students may add or drop classes in accordance with the dates outlined on the Academic Calendar (https://registrar.oregonstate.edu/osu-academic-calendar/).

**Advanced Placement:** Advanced placement and/or credit may be granted to an entering student who has satisfactorily completed College Board Advanced Placement Examinations taken during high school.

**Advanced Placement Report:** A summary of courses and credits completed by a student at one postsecondary institution and accepted by another institution at the time of admission. The advanced standing report is used to determine the number of required and elective credits needed to complete degree requirements.

**Advisor:** A faculty member appointed by a program, department, school, or college to advise students during their college experience.

**Baccalaureate Core:** The university’s general education requirements consisting of skills courses; perspectives courses; difference, power and discrimination courses; synthesis courses; and writing intensive courses. A baccalaureate core course is designated with an asterisk, *, a writing intensive course with a caret, ^. See Earning a Degree at Oregon State University (https://catalog.oregonstate.edu/earning-degrees/) in this catalog.

**Baccalaureate Degree:** An approved academic award given for the satisfactory completion of an instructional program requiring at least four but not more than five years of full-time equivalent college-level academic work that includes the following:

1. institutional general education requirements (i.e., baccalaureate core);
2. major area of study requirements; and
3. may include option, minor, supporting area, or elective requirements.

A minimum of 180 credits is required for most degree programs. Some majors may require more. The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

**BA Degree:** The Bachelor of Arts degree is conferred for broad and liberal education in humanities, arts, social sciences, and sciences. College BA requirements provide:

1. a breadth of preparation in these fields that is significantly greater than that required of all undergraduates through the baccalaureate core; and
2. foreign language proficiency certified by the School of Language, Culture, and Society as equivalent to that attained at the end of the second year course in the language.

Proficiency in American Sign Language equivalent to that attained at end of the second year also meets the BA language requirement.

**BFA Degree:** The Bachelor of Fine Arts is a professional degree requiring a minimum of 105 credits in the visual arts.

**BS Degree:** The Bachelor of Science degree is conferred for focused curricula that emphasize scientific ways of knowing and quantitative approaches to understanding in the sciences and social sciences, and for curricula in professional fields.

**Blanket-numbered Courses:** Reserved number courses such as 401/501/601. See Reserved numbered courses.

**Certificate Program (undergraduate):** A specified interdisciplinary program of study leading to an official certificate and notation on the transcript. A certificate program draws courses from more than one department, rather than a single department (as with most minors). An undergraduate certificate program must be taken in conjunction with a formal degree program. An undergraduate certificate requires a minimum of 27 credits.

**Certificate Program (postbaccalaureate):** A specified program of study of undergraduate courses leading to an official certificate and notation on the transcript. A completed baccalaureate degree program from an accredited institution is required. A postbaccalaureate certificate program requires a minimum of 27 credits.

**Certificate Program (graduate):** A structured progression of graduate-level courses that constitute a coherent body of study with a specifically defined focus within a single discipline or a logical combination of disciplines. It is designed for students who have completed a baccalaureate degree and are in pursuit of advanced-level learning. A graduate certificate requires a minimum of 18 graduate credits.

**Certificate Program (professional):** A site-based training and professional development certificate that is not transcript visible.

**College:** A subdivision of the university offering degree programs within a specific subject area. For example, the College of Forestry offers degree programs in forest engineering, forest resources, forest science, and wood science and technology.

**Commencement:** A term used to refer to the graduation ceremony held in June.

**Corequisite:** A course that must be taken concurrently with another course.
**Course**: An organized unit of instruction or research. Types include lectures, recitations, seminars, laboratories, discussions, internships, clerkships, reading and conference, independent study, and other categories of courses.

**Course Designator (subject code)**: An abbreviation representing the department, college, or program offering the course. Example: MB indicates that the course is offered through the Department of Microbiology.

**Course Numbering**: State universities in Oregon follow this basic course numbering system:

- 0–99. Noncredit or credit courses of a remedial, terminal, or semiprofessional nature that are not applicable toward degree requirements
- 100–299. Undergraduate, lower-division courses
- 300–499. Undergraduate, upper-division courses
- 500–599. Graduate courses offered primarily in support of a master’s degree but which are also available for doctoral-level credit. Undergraduates of superior scholastic achievement may be admitted on approval of the instructor and department head. An undergraduate student may apply to reserve these courses for later use on a graduate degree program
- 600–699. Graduate courses offered principally in support of doctoral-level instructional programs but also available for master’s program credit
- 700–799. Professional or technical courses that may be applied toward a professional degree (such as DVM or PharmD) but not toward other graduate degrees (such as PhD)
- 800–899. In-service courses aimed at practicing professionals in the discipline. These courses may not be applied to graduate or professional degree programs
- 001NC–099NC. Non-credit courses offered through the INTO Oregon State University Intensive English program

**Course Reference Number (CRN)**: A five-digit number used to select a specific course, lab, and/or recitation.

**Commonly Numbered Courses**: House Bill 2913 directed the Oregon University System (defunct since June 30, 2015) and Oregon community colleges to jointly develop, to the extent possible, a common course numbering system for lower-division transfer courses. The 'Commonly Numbered Course List' represents a good faith effort to meet the requirements of the legislation. The list of courses is recommended for use by campuses’ faculty and administration as they develop or revise academic programs to better facilitate students transferring from community colleges to public four-year institutions. OSU agreed to this list after review by all affected departments. The 'Commonly Numbered Course List' is available through the Office of Academic Programs and Assessment includes course descriptions in addition to the course numbers and titles. Course numbers and title should follow the usage in the list. Descriptions may vary.

**CRED (Credential)**: A student who has received a previous baccalaureate degree from either OSU or another accredited university or college may be granted a subsequent minor, certificate, major or option under the guidelines of Academic Regulation 27 (https://catalog.oregonstate.edu/regulations/). It indicates the student is not seeking a degree, but rather a credential to accompany an existing degree.

**Credit**: Credits vary, depending upon the type of course and level at which it is offered. One credit is generally given for three hours per week of work in and out of class. For example, each hour of class lecture is generally expected to require two hours of work out of class. One credit would be given for a lecture course that met for one 50-minute period each week over a 10-week period; i.e., 10 contact hours between faculty and students. One credit is typically given for a laboratory course that meets for two to three hours per week for an entire term. Equivalent credits are given for recitations, discussions, and other types of courses. All credits given in the Academic Catalog refer to quarter credits. When transferring in course work from a semester system institution, multiply the number of credits by 1.5 to determine how many quarter credits will be transferred (3 semester hours x 1.5 = 4.5 quarter credits). If planning to transfer OSU credits out to a semester system institution, multiply the number of quarter credits by .67 to determine how many credits will transfer (4 quarter credits x .67 = 2.68 semester credits).

**Curriculum**: (plural curricula) An organized program of study and courses required for a specific degree or certificate program.

**Degree**: An academic award granted upon satisfactory completion of a set of collegiate-level educational requirements.

**Discipline**: A field of study in which a student may concentrate, such as sociology, anthropology, or mathematics.

**Doctoral Degree**: An approved academic award given as a sign of proficiency in scholarship and for the satisfactory completion of an instructional program requiring at least three years of full-time equivalent academic work beyond the baccalaureate degree, the completion of which signifies recognized competence, original research and/or the capacity to do independent advanced graduate-level analysis. A minimum of 108 credits is required beyond the baccalaureate degree. [Note: The total number, above the minimum, will vary by degree program.] The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

**Double Degrees**: A student may earn multiple, different degrees simultaneously. Additional degrees may also be earned after your first degree was awarded. The degrees may be offered by the same college, or by different colleges. To earn a double degree, or for each additional degree, a student must complete a minimum of 32 credits above the minimum number of credits needed for one of the degrees. Each degree application is reviewed by the appropriate academic advisor. Advisors complete a separate graduation audit for each of the degrees.

On the student’s academic record, each degree awarded will be recorded as a separate degree with its major, e.g., Bachelor of Science in Mathematics, Bachelor of Arts in English. The student will also receive a separate diploma for each degree awarded (See Academic Regulation 26 (https://catalog.oregonstate.edu/regulations/)).

Some double-degree programs — Education (BA, BS, HBA, HBS), Innovation Management (BA, BSA, HBA, HBS), Sustainability (BS, HBS), International Studies (BA, HBA) — require that a primary degree be completed in order for the secondary degree to be awarded. When multiple degrees are not dependent on one another, one of the degrees may be awarded even though requirements for the other degree have not yet met. The double degree may be earned concurrently or subsequently. (See Academic Regulation 26 (https://catalog.oregonstate.edu/regulations/)).

**Dual (or Multiple) Majors from Same College**: A student may earn two or more majors within a single degree program (a particular combination of
degree, college, and campus, e.g., BA degree from the College of Liberal Arts on the Corvallis campus). It is sometimes possible to complete two or more majors within the minimum number of credits required for a degree, but usually the student must complete additional credits to complete requirements for all of their majors. For this reason, dual (or multiple) majors are obtained within the same college. The advisor must complete one graduation audit that includes all of the majors. The student's academic record will list one degree with two or more majors, e.g., Bachelor of Science in Mathematics and Chemistry. The student receives one diploma. Dual (or multiple) majors may be obtained concurrently with the completion of the degree, or in some cases may be earned as a credential subsequent to completion of the degree. (See Academic Regulation 27 [https://catalog.oregonstate.edu/regulations/].)

Note: Occasionally, with careful planning, a student can complete two majors from separate colleges in less than the 212 credits required for two degrees. When this occurs a student can petition for an exception, and graduate with two majors from separate colleges. The student must pick one college as their home college and all majors will be associated with the home college. The student must have the support of advisors from both major programs to have their petition considered.

Electives: Courses students may select, either for general knowledge or for fulfilling specific degree requirements. They are generally chosen and used by students to supplement or enrich the required curriculum.

Endorsement: An endorsement is the subject matter (content area) or specialty in which an individual is licensed to teach. Endorsements can be part of an initial teaching license or can be added later.

First Professional Degree: An academic award granted for an instructional program the completion of which: (1) signifies completion of the academic requirements to begin practice in the profession; (2) requires at least two years of full-time equivalent college-level work prior to entrance; and (3) usually requires a total of at least five years of full-time equivalent academic work to complete the degree program, including prior required college-level work plus the length of the professional program itself (examples, DVM in veterinary medicine and PharmD in pharmacy). The conditions and conferral of the award are governed by the faculty and ratified by the state of Oregon Higher Education Coordinating Commission.

Freshman: A student who has completed 44 of fewer term credits toward an undergraduate degree.

Grade-point Average (GPA): Total number of grade points received for A, A–, B+, B, B–, C+, C, C–, D+, D, D– or F grades divided by total number of credits attempted. OSU uses a 4-point grade scale.

Grade Points: Quality points assigned for one term credit of each grade: A = 4.0; A– = 3.7; B+ = 3.3; B = 3; B– = 2.7; C+ = 2.3; C = 2.0; C– = 1.7; D+ = 1.3; D = 1; D– = .7; F = 0.0. Grades of I, P, N, S, U and W are not computed.

Grades: [https://catalog.oregonstate.edu/grades-regulations-records/]
Letters used to indicate the quality of academic work completed in a given course: A, A–, B+, B, B–, C+, C, C–, D+, D, D–, F, I, S, U, P, N, W.

Graduation Audit: An evaluation of a student's academic record to determine if the graduation requirements set forth by the university, college, and major department have been fulfilled.

Graduate Area of Concentration: A graduate area of concentration is a subdivision of a major or minor in which a strong graduate program is available. Areas of concentration may be referenced on the student's program of study, but they are not listed on the student's transcript.

'Areas of concentration' can only be used in association with graduate programs.

Graduate Major: A graduate major is the area of academic specialization, approved by the State Board of Higher Education, in which the student chooses to qualify for a graduate degree. Upon completion of a graduate degree, the degree awarded and the graduate major are listed on the student's transcript.

Graduate Option: Options are for students of a specific major. An option is one of several distinct variants of course aggregations within a major that focuses on an area of study designed to provide a student with specialized knowledge, competence, and skills while sharing a minimum core of courses.

A graduate option consists of a minimum of 12 designated quarter credits of related course work (excluding thesis credits), comprised of course work offered by the sponsoring unit as well as by other academic units. The option may be comprised of specific courses, completion of a designated number of credits from a longer list of alternative courses, or a combination of specific and alternative course lists. Approved options may be added to a graduate program of study, and approved by the faculty advisor(s) and the director of the sponsoring unit. On the program of study, there should be no overlap in course credits between options (the same course cannot be used to satisfy credit requirements in multiple options). When the unit submits the final examination card to validate awarding of the major to the Graduate School, the unit will also validate that the requirements of the option have been completed.

Hybrid Course: A hybrid [http://ctl.oregonstate.edu/hybrid-learning/osu-hybrid-faqs/] course includes both regularly scheduled on-site classroom meetings and significant online, out-of-classroom components that replace regularly scheduled class meeting time. A substantial portion of the course learning activities are delivered online; face-to-face meeting time is generally reduced by approximately 50% compared to a traditional on-campus course.

Interdisciplinary: A course or program that integrates concepts, knowledge, or faculty from several fields of study.

Junior: A student who has completed at least 90 but not more than 134 term credits toward an undergraduate degree.

Lower-division Courses: Course offerings at a level of preparation usually associated with freshmen and sophomore students (e.g., 100- and 200-level courses).

Major (graduate): See Graduate major above.

Major (undergraduate): An extensive program of study in a designated subject area.

Master's Degree: An approved academic award given as a mark of proficiency in scholarship and for the satisfactory completion of an instructional program requiring at least one but not more than two years of full-time equivalent academic work beyond the baccalaureate degree. A minimum of 45 credits is required beyond the baccalaureate degree. [Note: The total number, above the minimum, will vary by degree program.] The conditions and conferral of the award are governed by the faculty and ratified by the Oregon State Board of Higher Education.

Minor (graduate): A graduate minor is an academic area that clearly supports the major. Master's program minors must include a minimum of 15 quarter credits of graduate course work; doctoral minors require a...
minimum of 18 credits. On a master’s or doctoral program, a minor may be:

1. an academic area available only as a minor;
2. a different major;
3. the same major with a different area of concentration, or
4. an integrated minor.

An integrated minor consists of a series of cognate courses from two or more areas. These courses must be outside the major area of concentration, with most of the courses being outside the major department. The graduate faculty member representing the integrated minor must be from outside the major department. Graduate minors are listed on the student’s transcript.

**Minor (undergraduate):** A secondary field of specialized study that may be offered by an academic unit for its own majors and/or majors from other academic units. Minors require at least 27 credits, 12 of which must be at the upper-division level. An approved minor is placed on the student’s transcript.

**Option (undergraduate):** Options are for students of a specific major. Options consist of at least 21 designated credits of course work, 15 of which must be at the upper-division level. If all requirements have been met, the option may be listed on a student’s transcript.

**Perspectives Courses:** Baccalaureate core courses that integrate fundamental knowledge from science and liberal arts disciplines to develop cultural, historic, and scientific perspectives.

**Postbaccalaureate Student:** A student holding a baccalaureate degree who is admitted to work toward a second baccalaureate degree or teaching certificate is classified as a postbaccalaureate student (AR 4 [https://catalog.oregonstate.edu/regulations/]).

**Pre-professional Program:** Curriculum generally offered at the freshman and sophomore levels. A pre-professional program is designed to ensure students have the aptitude, motivation, and discipline to successfully complete advanced course work as well as achieve the standards for a chosen career field.

**Prerequisites:** Requirements that must be completed before enrollment in a particular course. The instructor may waive a prerequisite.

**Professional Program:** Curriculum generally offered at the junior and senior level, designed to prepare students for a professional career within a specific field (e.g., engineering, pharmacy). Admission to professional programs, often based on prior course work and/or work experience, is competitive.

**Program:** Academic studies that comprise the core, required and elective courses that lead to a degree or qualification. At OSU, this includes majors, minors, options and certificates.

**Reading and Conference:** A course focused on reading assignments to be completed in conferences with the instructor.

**Reserved Numbered Courses:** Certain blocks of numbers that have been assigned for specific courses that may be taken for more than one term. The credits being granted vary according to the amount of work done.

**100–110 and 200–210:** Survey or foundation courses in the liberal arts and sciences

**401/501/601:** Research and Scholarship

**402/502/602:** Independent Study

**403/503/603:** Thesis/Dissertation

**404/504/604:** Writing and Conference

**405/505/605:** Reading and Conference

**406/506/606:** Special Problems/Special Projects

**407/507/607:** Seminar

**408/508/608:** Workshop

**409/509/609:** Practicum/Clinical Experience

**410/510/610:** Internship/Work Experience

**Senior:** A student who has completed 135 or more term credits toward an undergraduate degree.

**Sequence:** Two, three, or four closely related courses that are usually taken in numerical order and through more than one term.

**Skills Courses:** Baccalaureate core courses designed to give the student fundamental mathematical, communication, and fitness competence.

**Sophomore:** A student who has completed at least 45 but not more than 89 term credits toward an undergraduate degree.

**Special Topics Courses (X99):** Like reserved numbered courses, special topics courses may be repeated as specified by the academic unit responsible for the course offering. It is implied that the course content is different each time the student takes the course. In the schedule of classes, section titles are listed as ‘ST/’ followed by the topic covered in the section.

**Student Enrollment Levels:** The levels below establish enrollment levels for federal financial aid eligibility and the deferral of student loans. Summer enrollment levels are the same as other terms.

- Full Time: 12 or more credits in a term
- Three Quarter Time: 9 to 11 credits in a term
- Half Time: 6 to 8 credits in a term

**Syllabus:** A list of course objectives, lecture topics, assigned reading, exams, etc., prepared and distributed by a professor at the beginning of the term.

**Synthesis Courses:** Baccalaureate core upper-division courses that emphasize interdisciplinary, critical thinking approaches to global, technological, and societal issues.

**TBA:** Commonly used abbreviation for ‘to be arranged’; time, place, or credit of a course is to be arranged with the instructor.

**Term:** Usually one-third of the school year. Terms at OSU are divided into fall, winter, and spring terms (also referred to as ‘quarters’). Summer term is generally an 8- or 11-week session during the summer. See ‘Credits’ above.

**Transfer Student:** An individual who has completed 36 or more transferable term credits at another institution and will resume their college course work at a second institution.

**U-Engage:** First-year seminar designed to assist the transition of new students to college.

**University:** An assembly of colleges, each specializing in a different field.

**Upper-Division Courses:** Advanced course offerings at a level usually associated with junior or senior students. Upper-division courses are numbered in the 300s and 400s.
**Waive:** This term refers to decisions of advisors to ‘waive’ a course or courses in a student’s program. Typical reasons include transfer credit for equivalent courses, equivalent experience in the profession or discipline, and petitioning for and successfully completing an examination. Waiving courses usually does not decrease the total credits required for completion of the degree or program; students should discuss this with their advisor.

**Withdraw:** To voluntarily leave a course or the term without academic penalty. A W letter grade will be placed on the student’s transcript for each course attempted.

**Workshop:** A brief intensive course for a small group which emphasizes problem solving.

**Writing Intensive Courses (WIC):** Designated upper-division courses in the major discipline that use student writing as a significant approach to learning. WIC courses must meet a variety of requirements, as do other courses in the baccalaureate core. WIC courses have a carat, ^, in front of the title.
When determining the graduation requirements for a given student:

- Students must meet all applicable degree requirements from the published catalog(s).
- The student’s catalog year for institutional and baccalaureate core requirements is established by their first term of attendance (matriculation date) at Oregon State University as an admitted student.
- The student’s catalog year for college/major/option/ minor requirements is based on the date of declaration of the major/option/ minor; consequently, a student’s first (primary) major/option must be in the same catalog year. If a primary option is declared in a subsequent academic year, the primary option will be aligned with the catalog year of the primary major. If the primary option did not exist in the catalog year of the primary major, the primary major will roll forward to the catalog year of the primary option.
- Additionally, while the student’s first major/option must be in the same catalog year, any additional declarations of majors/ options/minors will be determined by the declaration dates (and corresponding catalog years) established by the change of academic program process. A student, in collaboration with an advisor, can also choose to graduate under a subsequent (to their most recent major declaration date) catalog year within the same major/option.
- At the time of graduation, all students, including transfer students, must use a catalog that is not more than ten years old. Students may petition to the head advisor of their college for an extension of a catalog greater than ten years prior to their expected graduation term.
- Current policy requires a student to reapply after not enrolling at OSU for four consecutive terms (not including summer terms); the published catalog for the resulting readmission/matriculation date will become the catalog of record for graduation requirements. The Planned Educational Leave Program defined in AR 13.c beginning with 2011–2012 academic year, provides a mechanism for a student to sustain their original catalog of record during a planned absence.
- For Degree Partnership Program students, the first term the student is admitted to OSU will be the matriculation date and will determine the catalog year for institutional and baccalaureate core requirements. The catalog year for college/major/option/ minor requirements will be the same as all other OSU students.
- Every effort has been made to ensure the accuracy of information in the OSU Academic Catalog. However, Oregon State University or the Oregon State Board of Higher Education may find it necessary from time to time to make changes in courses, curricula, or degree requirements. Students already admitted to a program in which such changes have been made will be reasonably accommodated, if possible, to ensure their normal progress toward a degree. A student may, however, still be required to conform to changes in courses, curricula, or degree requirements as deemed necessary by Oregon State University or the State Board of Higher Education.

Grading System
Grades
The grading system consists of:

- **A** = Exceptional, 4.0 grade points per credit.
- **A–** = 3.7 grade points per credit.
- **B+** = 3.3 grade points per credit.
- **B** = Superior, 3.0 grade points per credit.
- **B–** = 2.7 grade points per credit.
- **C+** = 2.3 grade points per credit.
- **C** = Average, 2.0 grade points per credit.
- **C–** = 1.7 grade points per credit.
- **D+** = 1.3 grade points per credit.
- **D** = Inferior, 1.0 grade point per credit.
- **D–** = 0.7 grade point per credit.
- **F** = Failure, 0.0 grade point per credit.
- **G** = Reserved for Graduate Credit, no grade point per credit.
- **I** = Incomplete, no grade points or credits.
- **I/Alt Grade** = Incomplete, no grade points or credits. If not resolved after 12 months or degree conferral, the ‘I’ reverts to the alternate grade.
- **N** = No credit, no grade points or credits.
- **NG** = No basis for a grade, no credit or grade points.
- **P** = Pass, credit given, no grade points.
- **R** = Thesis in Progress, credit given, no grade points.
- **S** = Satisfactory, credit given, no grade points.
- **TR** = Accepted Transfer Credit.
- **U** = Unsatisfactory, no credit or grade points.
- **W** = Withdrawal (passing), no credit or grade points.
- **WC** = Complete withdrawal, no credit or grade points.
- **AUD** = Audit, no credit or grade points.
- **WAU** = Withdrawal from Audit, no credit or grade points.

When a requirement of a course has not been completed for reasons acceptable to the instructor and the rest of the academic work is passing, a report of I (incomplete) may be made and additional time granted. The I is only granted at the discretion of the instructor. The instructor must submit the grade the student will earn if the missing work is not completed. That alternate grade will become the default grade if the missing work is not completed. The instructor documents the deficiency and the deadline for completing the missing work. A record of the deficiency shall be kept on file in the unit or department office. The allotted time awarded shall not exceed one calendar year except by petition or the time of the degree conferral, whichever comes first. To remove the I grade, the student must complete the deficiency within the allotted time and the instructor will then submit the appropriate grade. If the student fails to complete the work within the allotted time, the Office of the Registrar will automatically change the I grade on the student’s record to the alternate grade submitted by the instructor at the time the I was given. The alternate grade will be included in the grade-point average. Under no circumstances shall a student who earns an A– F grade or an N or U grade have their grade changed retroactively to an I grade.

An instructor may move to correct a grade by filing a Change of Grade in the Registrar’s Office. Grade changes for students of a permanently separated instructor will be managed by the department chair of the
course involved. Upon permanent separation from the University an instructor’s change of grade will not be accepted by the Office of the Registrar. The Office of the Registrar will routinely review grade changes.

Students may withdraw from a course. In such cases, a grade of W is assigned. A student who discontinues attendance in a course without official withdrawal receives a grade of F in the course.

1 A student may petition via the Office of the Registrar for an extension of the one calendar year deadline with the concurrence of the faculty. An approved petition will grant an extension of a single additional term, with a maximum of three total extensions being possible. An approved petition for an extension of time to remove an incomplete will be voided at the time of degree conferral.

Grade Points
Grade points are computed on the basis of 4 points for each credit of A grade, 3.70 for each credit of A– grade, 3.30 for each credit of B+ grade, 3.00 for each credit of B grade, 2.70 for each credit of B– grade, 2.30 for each credit of C+ grade, 2.00 for each credit of C grade, 1.70 for each credit of C– grade, 1.30 for each credit of D+ grade, 1.00 for each credit of D grade, .70 for each credit of D– grade, and 0 for each credit of F.

Marks of I, Alt, W, WC, P, N, NG, R, S, and U are disregarded in the computation of points. The grade-point average (GPA) is the quotient of total points divided by total credits; total credits are the number of term credits in which grades A, B, C, D, and F are received.

Academic Standing
Satisfactory Academic Standing (Undergraduate Students) (AR 22)
Oregon State University expects students to maintain satisfactory academic progress toward degree completion. At the conclusion of each term, grade-point averages are calculated and academic standings determined for students seeking a baccalaureate degree according to the criteria outlined below. Students whose standings evidence a lack of satisfactory progress will be warned of this condition and advised to seek help from their academic advisors. Any student who is not on Academic Warning, Academic Probation, or Academic Suspension is in good standing.

1. Academic Warning: Students with a term GPA below 2.0 will be placed on Academic Warning.
2. Academic Probation: Students who have attempted1 24 or more credits at OSU and have an OSU cumulative GPA below 2.0 will be placed on Academic Probation. Students who attain a cumulative GPA of 2.0 or better are removed from Academic Probation.
3. Academic Suspension: Students who are on Academic Probation and have a subsequent term GPA below 2.0 will be placed on Academic Suspension. Academic Suspension is recorded on the student’s academic record. Students who are academically suspended are denied all the privileges of the institution and of all organizations in any way connected to it, including any university-recognized living group.
4. Reinstatement to the University: Suspended students will be considered for reinstatement to the university after two years or completion of a minimum of 24 quarter credits of transferable college-level work at an accredited college or university, with a GPA of 2.5 or above.

The Faculty Senate Academic Standing Committee (http://senate.oregonstate.edu/academic-standing-committee/) is responsible for enforcement of the above regulations on Satisfactory Academic Standing. Additionally, this committee has discretionary authority to grant exceptions and to develop guidelines for administering these regulations.

1 An attempt comprises a final grade in a course where the grade is: A, A–, B+, B, B–, C+, C, C–, D+, D, D–, F, S, U, P, NP, I/Alternate Grade (where the Alternate Grade is one of these grades), W.

Attendance
An instructor has the privilege of considering class participation in arriving at a student’s grade, but it is not intended that attendance in and of itself normally be a factor in measuring a student’s academic accomplishment in a course.

Other Limitations
Academic performance is not the sole criterion for admission to and continuation in certain courses and programs at the university, such as practicum courses and internships. The university may find it necessary to evaluate a person’s background to determine their likelihood of maintaining standards of professional conduct that are necessary in the academic discipline or profession. An evaluation may take into consideration current performance, as well as past experiences and actions that could affect a student’s ability to perform in the particular course or program.

Student Conduct Regulations
Oregon State University aspires to stimulate a lasting attitude of civility, social responsibility and openness in our students as well as an appreciation for our values of accountability, diversity, respect, and truth. Consistent with that, all students enrolled at OSU are expected to follow student conduct regulations and university policies that have been developed to govern the behavior of students as well as members of the university community. These regulations and policies are formulated to guarantee each student’s freedom to learn and to protect the fundamental rights of others. The assumption upon which these regulations are based is that all people must treat others with dignity and respect in order for scholarship to thrive. The regulations and procedures for disciplinary action and appeal are available on the OSU website (http://studentlife.oregonstate.edu/studentconduct/). Violations of the regulations subject a student to appropriate disciplinary or judicial action. These regulations have been formulated by the Student Conduct Committee, the Student Activities Committee, the university administration, and the State Board of Higher Education.

Student Grades
Student grades may be obtained via MyOSU (https://myosu.oregonstate.edu): Select Student, then Student Grades. Or obtain an unofficial transcript under Academic Profile, and click on Transcript. Grades are not automatically mailed to the student.

You may request a transcript online (http://registrar.oregonstate.edu/transcripts/) at no charge.

Grades, GPA calculations, and academic standings are not complete and final prior to 8 a.m. on the Wednesday following the final exam week. Grades and GPAs appearing prior to that day may be incomplete.
Student Records

Family Educational Rights and Privacy Act of 1974, as amended, (20 U.S.C. 1232g) provides that Oregon State University students have the right to inspect and review the student's education records within 45 days of the day the university receives a request for access; the right to request the amendment of the student’s education record if the student believes that the records are inaccurate or misleading; the right to consent to disclosures of the personally identifiable information contained in the student's educational record, except to the extent that FERPA authorizes disclosure without consent; and the right to file a complaint with the U.S. Department of Education concerning alleged failures by Oregon State University to comply with the requirements of FERPA. The Student Records Policy is available in the OSU Academic Catalog.

Progress Standards for Veteran Students

Programs at Oregon State University are approved for the use of VA benefits under the Montgomery GI Bill®, Dependents Educational Assistance, and Title 38 and Title 10 of the US Code, or benefits offered by the State of Oregon Department of Veteran Affairs. The university, through the Registrar’s Office, provides the certifying service to qualified students. The certifying official issues enrollment certification documents to the appropriate VA regional office and monitors students’ satisfactory progress for the VA. Any student receiving GI Bill® education benefits while attending Oregon State University is required to obtain transcripts from all previously attended schools and submit them to the school for review of prior credit.

1. OSU students who receive benefits from the Veterans Benefits Administration of the Department of Veterans Affairs are subject to the satisfactory progress standards as set forth in Chapter 38, U.S. Code sections 1674, 1724, 1775, and 1776, and to those defined by the university in Academic Regulation 22, Satisfactory Academic Standing:

2. Oregon State University expects students to maintain satisfactory academic progress toward degree completion. At the conclusion of each term, grade-point averages are calculated and academic standings determined for students seeking a baccalaureate degree according to the criteria outlined below. Students whose standings evidence a lack of satisfactory progress will be warned of this condition and advised to seek help from their academic advisors. Any student who is not on Academic Warning, Academic Probation, or Academic Suspension is in good standing.

   a. Academic Warning: Students with a term GPA below 2.0 will be placed on Academic Warning.

   b. Academic Probation: Students who have attempted 24 or more credits at OSU and have an OSU cumulative GPA below 2.0 will be placed on Academic Probation. Students who attain a cumulative GPA of 2.0 or better are removed from Academic Probation.

   c. Academic Suspension: Students who are on Academic Probation and have a subsequent term GPA below 2.0 will be placed on Academic Suspension. Academic Suspension is recorded on the student's academic record. Students who are academically suspended are denied all the privileges of the institution and of all organizations in any way connected to it, including any university-recognized living group.

   d. Reinstatement to the University: Suspended students will be considered for reinstatement to the university after two years or completion of a minimum of 24 quarter credits of transferable college-level work at an accredited college or university, with a GPA of 2.5 or above.

3. Students, who are placed on probation by the university, also will be notified that they are on probation insofar as Veterans Affairs’ progress standards are concerned. If a student’s deficiency is not corrected and they subsequently are placed on academic suspension, the university will notify Veterans Affairs of their unsatisfactory progress.

4. The university will recertify students who are suspended by the university and subsequently reinstated by the Academic Standing Committee.

5. Students dismissed from the university for unsatisfactory conduct will be reported as making unsatisfactory progress. The university will recertify the student only upon rescission of the dismissal by the university.

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by VA is available at the official U.S. government website (https://www.benefits.va.gov/gibill/)

Options for Exemption from Nonresident Tuition

HB 2158 (2013) and HB 4021 (2014) section 1. ORS 352.375

A public university listed in ORS 352.002 or community college shall charge an enrolled student who is not a resident of this state, and who is attending classes as an undergraduate or graduate at a public university or community college campus in this state, tuition and fees no greater than the resident rate if the student:

a. Served in the armed forces of the United States; and

b. Was relieved or discharged from that service with either an honorable discharge or a general discharge under honorable conditions; and

c. Undergraduate student newly enrolled after September 15, 2013, or graduate student newly enrolled after September 15, 2014, and

d. Provides proof that the student has established a physical presence in Oregon within 12 months of being enrolled at the public university or community college.


Students eligible for in-state tuition under Section 702 (“Choice Act”) include:

- A Veteran who lives in the state in which the institution of higher learning is located (regardless of their formal state of residence) and enrolls in the school within three years of discharge from a period of active duty service of 90 days or more.
- A spouse or child using transferred benefits who lives in the state in which the institution of higher learning is located (regardless of their formal state of residence) and enrolls in the school within 3 years of the transferor’s discharge from a period of active duty service of 90 days or more.
- A spouse or child using benefits under the Marine Gunnery Sergeant John David Fry Scholarship who lives in the state in which the institution of higher learning is located (regardless of their formal
state of residence) and enrolls in the institution within three years of the servicemember’s death in the line of duty following a period of active duty service of 90 days or more.

- Anyone using transferred Post-9/11 GI Bill® benefits (38 U.S.C. § 3319) who lives in the state in which the institution of higher learning is located (regardless of their formal state of residence) and the transferor is a member of the uniformed service who is serving on active duty.

- Anyone using Vocational Rehabilitation benefits (38 U.S.C. § 3102) who lives in the state in which the institution of higher learning is located (regardless of their formal state of residence).

Choice Act eligible students will continue to receive in-state tuition rates after they have used all of their GI Bill® benefits or Marine Gunnery Sergeant John David Fry Scholarship benefits as long as the student remains continuously enrolled. If there is a break in enrollment, or if the student changes their program of study after exhausting their VA educational benefits, they will no longer receive in-state tuition rates.

Veterans who do not qualify under the Choice Act will likely qualify under HB 2158 (2013) and HB 4021 (2014) section 1. ORS 352.375 or HB 2787 Veterans who do not qualify under the Choice Act will likely qualify under HB 2158 (2013) and HB 4021 (2014) section 1. ORS 352.375 or HB 2787 (see above).

If you are a Veteran and need to apply for residency, you may need to complete a Residency Affidavit (https://admissions.oregonstate.edu/sites/admissions.oregonstate.edu/files/residency_affidavit.pdf) or the Exemption from Nonresident Tuition Veteran Form (https://registrar.oregonstate.edu/sites/registrar.oregonstate.edu/files/forms/exemption-from-nonresident-tuition_2018.pdf) depending on your circumstances.

Another helpful resource when applying for residency are the Instructions for Completing Residence Information Affidavit (https://admissions.oregonstate.edu/residency-frequently-asked-questions-faq/#military).

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by VA is available at the official U.S. government website (https://www.benefits.va.gov/gibill/)

School Certifying Official (SCO)

The School Certifying Official (SCO) certifies the enrollment of veterans and eligible dependents at Oregon State University. All veterans and eligible dependents, whether new, returning, or transfer students, who expect to receive educational benefits from the Veterans Administration must notify the SCO in the Registrar’s Office. For questions about benefits, contact veterans@oregonstate.edu.

The School Certifying Official also monitors and reports to the Veterans Administration the Satisfactory Progress Standards for students who are receiving VA education benefits. See Progress Standards for Veteran Students for more information.

Military Tuition Assistance Program

The School Certifying Officials (SCO) at Oregon State University are the direct contact points for students using the Military Tuition Assistance Program. SCOs process students’ tuition assistance authorizations and contracts and forward copies to OSU Business Affairs for billing the military branches. Depending on the branch of the military, requirements vary on how grades are reported. Grade reporting is done at the end of each academic term.

For questions about the Military Tuition Assistance Program, contact veterans@oregonstate.edu.

Veteran and U.S. Military Service Recognition Cord

Recognition of U.S. Military Service

Oregon State University recognizes the significant contribution and sacrifices made by OSU students who are U.S. military servicemembers and veterans. Students may receive red, white, and blue Military Service Recognition Cords to be worn at commencement.

Servicemembers and veterans may visit the Office of the Registrar in Kerr Administration Building during the month prior to commencement to request cords.

Undergraduate Planned Educational Leave Program

Students may find that a planned interruption or pause in their regular, full-time education is needed. PELP is designed to enhance the prospect of successful completion of an academic program by allowing a student to arrange a voluntary absence that temporarily suspends their academic work for a period of time. For detailed information please refer to Academic Regulation 13 (p. 18).

Unauthorized Peer-to-Peer (P2P) File Sharing and Other Copyright Infringement

The university takes copyright infringement seriously. As set forth in the Acceptable Use of University Computing Resources Policy, all students must abide by federal and state copyright laws when using university computing or network resources. The unauthorized publishing or use of copyrighted material on the university computer network is strictly prohibited and users are personally liable for the consequences of such unauthorized use. This specifically applies to Peer-to-Peer or P2P file-sharing of copyrighted music and movies. Students should be aware that by engaging in unauthorized sharing of copyrighted material, they not only violate university policy, but they...
may also be held criminally and civilly liable by federal and/or state authorities.

Under current copyright law, criminal cases of copyright violation carry a penalty of up to five (5) years in prison and a $250,000 fine. Civil penalties for copyright infringement include a minimum fine of $750 for each work. Oregon State University will subject students who violate this policy to discipline as appropriate. For a first-time violation of this copyright policy, students are required to pass a copyright quiz within 72 hours or else their network access is disabled. Repeated infringement is subject to disciplinary action by the office of Student Conduct and Community Standards, up to and including expulsion from the university.

The entire policy regarding Unauthorized Peer-to-Peer (P2P) File Sharing and Other Copyright Infringement is available online (http://fa.oregonstate.edu/gen-manual/).

**Student Records-Right to Privacy**

**Notice to Students Regarding Privacy of Records**

The Family Educational Rights and Privacy Act (FERPA) of 1974 (Public Law 93-380), as amended, Oregon Revised Statutes 351.065, and Oregon Administrative Rule 580-013-0005 of the State Board of Higher Education afford students certain rights with respect to their education records. They are:

1. The right to inspect and review the student’s education records within 45 days of the day the university receives a request for access. Students should submit to the registrar, dean, head of the academic department, or other appropriate official, written requests that identify the record(s) they wish to inspect. The university official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the university official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2. The right to request the amendment of the student’s education record that the student believes are inaccurate or misleading. Students should write the university official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the university decides not to amend the record as requested by the student, the university will notify the student of the decision and advise the student of their right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. The right to consent to disclosures of the personally identifiable information contained in the student’s educational record, except to the extent that FERPA authorizes disclosure without consent. One exception that permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the university in an administrative, supervisory, academic or research, or support staff position (including health staff and members of the Law Enforcement Unit); a person or company with whom the university has contracted; a person or company acting as consultant or volunteer for the university; a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing their tasks. A school official has a legitimate educational interest if the official needs to review an educational record in order to fulfill their professional responsibility.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by Oregon State University to comply with the requirements of FERPA.

The name and address of the office that administers FERPA is:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, DC 20202-5920
1-800-USA-LEARN (1-800-872-5327)

**Revised directory information effective May 2014:** Oregon State University will provide the following ‘directory’ information to all inquiries without students’ written consent:

- student’s name
- current mailing address and telephone number
- current OSU ONID email address
- campus office address
- class standing (e.g., freshman, sophomore, etc.)
- student level (undergraduate, graduate, etc.)
- college
- major field of study
- honors
- full-time or part-time enrollment status
- status as a graduate teaching assistant or graduate research assistant and hours of service.
- participation in officially recognized activities and sports
- dates of attendance
- anticipated graduation date
- degrees and awards received
- date(s) of degree(s)
- most recent previous educational institution attended by student

A student may request in writing that all of the above directory information be kept confidential. This option may be exercised by filing a written, dated, and signed request at the Office of the Registrar at any time. The restriction remains in effect until revoked by the student even if the student leaves the university or graduates.

The procedures for exercising the above rights are explained in Oregon Administrative Rules 576-020-0005 through 576-020-0065.

**Release of Student Information to Military Recruiters (Solomon Amendment)**

Oregon State University provides information about students that is requested by military recruiters under requirements of the Solomon Amendment (As of Oct. 23, 1998 [63 Fed. Reg. 56819] and the Interim Rule published Jan. 13, 2000 [65 Fed. Reg. 2056] by Department of Defense). Under this federal law military recruiters may request the following information: Name, current mailing address (as provided by the student) including email address, current telephone number (as provided by the student), age, class level (e.g., freshman, sophomore, etc.), and academic major. The information may be requested for the immediately previous term, current term, or future term for all students.
age 17 and older who are or were registered at OSU for at least 1 credit in the requested term. Recruiters may request this information each term. Recruiters may not obtain any information that is not in the above list of student recruiting information. For example, they may not request any of the following: Social Security Number or ID Number, place of birth, race/ethnicity/nationality, grades and GPA, grades of low-performing students, religious affiliation, names of students with loans in default, veteran status, or names of students no longer enrolled at OSU. Institutions that do not comply with the Solomon Amendment risk losing federal funding from the departments of Defense, Education, Health and Human Services, Labor, and Transportation. Institutions do not risk losing student-aid funding such as Perkins Loans, Federal SEOG or Work-Study funds.

**Use of Social Security Number (SSN)**

You are requested to provide voluntarily your Social Security Number to assist OSU (and organizations conducting studies for or on behalf of OSU) in developing, validating, or administering predictive tests and assessments; administering student aid programs; improving instructions; internal identification of students and alumni; collection of student debts; or comparing student educational experiences with subsequent workforce experiences. When conducting studies, OSU will disclose your Social Security Number only in a manner that does not permit personal identification of you by individuals other than representatives of OSU (or the organization conducting the study for OSU) and only if the information is destroyed when no longer needed for the purposes for which the study was conducted. By providing your Social Security Number, you are consenting to the use identified above. This request is made pursuant to ORS 352.004, ORS 352.107, and ORS 352.146. Provision of your Social Security Number and consent to its use is not required and if you choose not to do so you will not be denied any right, benefit, or privilege provided by law. You may revoke your consent to the use of your Social Security Number at any time by contacting: Office of the Registrar, Oregon State University, Corvallis, OR 97331-2130; 541-737-4331.

All access and use at Oregon State University of the Social Security Number is prohibited except for meeting federal or state requirements, compliance, and reporting.

**Students Rights to Privacy of Records Tutorial (FERPA)**

A brief online tutorial that explains students’ rights may be viewed at [http://registrar.oregonstate.edu/ferpa-training-module/](http://registrar.oregonstate.edu/ferpa-training-module/).

**OSU Directory**

The OSU Campus Directory is a directory of staff and student names, addresses and telephone numbers. This information is extracted at the end of the second week of the fall term and is published annually and posted on the OSU website. To find students, faculty and staff, use the Search box for Find people and pages or go to [http://directory.oregonstate.edu/](http://directory.oregonstate.edu/).

Students who do not want information to be included in either the printed or electronic version should indicate that in their Directory Profile on the Web before the end of the second week of fall term. Just log in to MyOSU at [https://myosu.oregonstate.edu](https://myosu.oregonstate.edu) and under Update Personal Profile select OSU Directory Preferences, then follow the instructions on that page.

**Student Photo Roster**

Getting to know students is an important means by which instructors and advisors can improve the quality of the learning environment.

**Accessing Student Photo Roster System:**

1. Login to MyOSU at [https://myosu.oregonstate.edu](https://myosu.oregonstate.edu).
2. Under Update Personal Profile, select OSU Directory Preferences.
3. Check or uncheck the checkbox ‘Photo Viewable to Advisor’.
4. Check or uncheck the checkbox ‘Photo Viewable to Instructor’.
5. Click the ‘Submit Changes’ button to update your Directory Profile.

To view your choices regarding opting in or out of the Student Photo Roster System, please view it online using the instructions above.

Selecting the ‘opt in’ option for instructors means that all instructors of record associated with the student’s current classes will be able to view the photograph.

Students can change their minds at any time.
HOW TO READ THE SCHEDULE OF CLASSES

Registration instructions can be found on the Office of the Registrar website (https://registrar.oregonstate.edu/registration/).

Courses in the Schedule of Classes are arranged alphabetically and numerically by course designator or subject code. For example, ENG for English, MTH for mathematics.

Schedule of Classes Terms and Abbreviations

Avail = Remaining seats available

Baccalaureate / WIC Courses

All baccalaureate core classes in the Schedule of Classes have an asterisk '*' in the title. The course description also contains the note, '*(Bacc Core Course)*'.

All writing intensive course classes (WIC) have a carat ^ in the title. The course description also contains the note, '*(Writing Intensive Course)*'.

Campus

'Dx' = Ecampus - Distance Ed = An Ecampus course (Additional abbreviations may follow indicating a specific location or course level such as 'LD' for lower division and 'UD' for upper division)

'B' = Oregon State - Cascades = OSU Cascades Campus in Bend, Oregon

'C' = Oregon State - Corvallis = Corvallis Campus

'N' = Newport/HMSC = Hatfield Marine Science Center in Newport, Oregon

'L' = EOU = OSU courses taught at Eastern Oregon University in LaGrande, Oregon

'PDX' = Oregon State - Portland

Cap = Seating Capacity

Curr = Current Enrollment

Comments

Special instructions, textbooks required, etc.

Courses with Labs/Recitations/Studios

If a course lecture is 'linked' to a noncredit lab or recitation or studio, you must register for all parts of the course. Web registration will not permit you to register for one part without the other. Likewise, you may not drop only one part of a 'linked' course; if you do so, the other part will be dropped automatically. If you want to change one part of a multi-part course, you should drop the part and add a new part at the same time before processing your requested changes. Be sure to process the request after specifying the drop and the add.

Course Numbers

100/200 = Lower Division, Undergraduate

300/400 = Upper Division, Undergraduate

500 = Graduate, primarily Master's

600 = Graduate, primarily Doctoral

700 = Professional, DVM, PharmD

800 = In-service courses for practicing professionals

CRN

The unique Course Reference Number identifying each class.

Cr = Credit

All credits listed in the Schedule of Classes refer to quarter credits.

If a course is taught for variable credits, for example 1–16 credits, Web registration will prompt you to enter the correct number of credits for which you want to enroll. If you need to change that number later, you may do so via the Web.

Day/Time/Date

Days of the week and hours the class meets (see Meeting Time below), and start and end dates of classes.

End Date

Last day of classes before finals week.

Fees

A list of course fee codes, their description, and the fee amounts are listed in the catalog under Tuition, Fees and Payment at https://catalog.oregonstate.edu/fees-residency-requirements/. Additional information is in the Business Affairs website at http://fa.oregonstate.edu/business-affairs/tuition-and-fee-information/.

Instructor

Name of instructor or staff.

Location

See the campus map at https://map.oregonstate.edu/ for building abbreviations and locations.

Meeting Time

Days of the week are abbreviated as follows:

M = Monday

T = Tuesday

W = Wednesday,

Th = Thursday

F = Friday

S = Saturday

TBA = To Be Announced

NSHD

No-show-drop will appear in the Comments column. A student who is registered for such a course who attends no meetings of the course during the first five school days of the term will be dropped from the course by the instructor, unless the student has obtained prior permission for absence. See Academic Regulation 9b (https://catalog.oregonstate.edu/regulations/).

P/N = Pass/No Credit

A class is graded A–F unless P/N appears, in which case Pass/No Credit grading applies.
All courses registered via the Web are given the A–F or P/N grade option as appropriate. Any change of the A–F option (to S/U) is done in-person at the Office of the Registrar after completing the Change of Grading Basis form (http://oregonstate.edu/registrar/forms/). The deadline for these changes is the end of the 7th week of classes. See the Academic Calendar (http://registrar.oregonstate.edu/osu-academic-calendar/).

Restrictions

Prerequisites, corequisites, limitations to registration. See Registration Restrictions below.

Sec = Section

Section Title

Seminars, special topics, blanket courses and others may have course subject section titles.

Section Description

Description of what the topic covered.

Session

Summer term sessions, e.g., 8-week session.

Start Date

First day of class.

Status

Whether the section is open, closed, waitlisted or cancelled for registration.

TBA = To be announced.

Term

Su 18 = Summer term 2018
F 18 = Fall term 2018
W 19 = Winter term 2019
Sp 19 = Spring term 2019

Type

The method of instructional delivery.
A=Lecture
B=Discussion
C=Recitation
D=Laboratory
E=Seminar
F=Independent or Special Studies
FNL=Final Exam
G=Research
H=Activity
HYB=Hybrid (a combination of online and classroom)
I=Experimental
J=Internship
L=Tutorial
M=Practicum
MID=Midterm
N=Reading and Conference
O=Experiential/Co-op Education
P=Programmed Instruction
Q=Thesis
R=Studio
U=Externship
V=Examination for Credit
W=Workshop
Y=Online
Z=Modular

Weeks

Number of weeks in the term or summer session.

WL Avail = Seats available on waitlist
WL Cap = Waitlist capacity
WC Curr = Students currently on waitlist

Registration Restrictions

Prerequisites

Prerequisites provide the background necessary for successful performance in a course. Students may attempt a course without having prerequisites if they have obtained the consent of the instructor to do so. If the instructor’s consent is not obtained, then students who have not fulfilled published prerequisites may be disenrolled from the course during the first week of classes.

Departmental Approval

Special approval is required for this course; the student requests an ‘override’ from the department teaching the course, and then the student registers for the course.

+/−

+ indicates ‘only’. For example, under class limitation +1 means only freshmen, – indicates ‘no’. Under college limitation, –1,7 means no students from College of Agricultural Sciences or the College of Pharmacy may register.

AL=Alphabetic Sections (Alpha sections for WR 121)

WR 121 course sections have registration limitations determined by the first letter of the student’s last name. These are marked in the comments or restrictions column with the following codes:

• AL+AG = Students whose last names range from A to G may register that term.
• AL+HN = Students whose last names range from H to N may register that term.
• AL+OZ = Students whose last names range from O to Z may register that term.

CL=Class Standing.

The catalog system translates these codes into the following terminology:

1 = Freshman
2 = Sophomore
3 = Junior
4 = Senior
5 = Undergraduate nondegree
6 = Graduate nondegree
7 = Postbaccalaureate (undergraduate)
8 = Master’s candidate
9 = Doctoral candidate
G = Postbaccalaureate (graduate)
V = Professional

**CO=College Codes**
The catalog system translates these codes into the following terminology:

01 = Agricultural Sciences
02 = Business
03 = Education
04 = Pre-Engineering
05 = Forestry
07 = Pharmacy
08 = Science
09 = Graduate School
10 = Liberal Arts
11 = Defense Education (ROTC)
14 = University Exploratory Studies Program
15 = Veterinary Medicine
16 = Engineering
17 = Interdisciplinary Programs
18 = University Honors College
22 = Pre-Business Program
23 = Public Health and Human Sciences
24 = Oceanic and Atmospheric Sciences
EP = Intensive English Program

**DG=Degree**
If a course is restricted to students pursuing specific degrees, it will list a code of DG + – under the Registration Restrictions column. Degrees listed may include HBA (Honors Bachelor of Art), HBFA (Honors Bachelor of Fine Arts) and HBS (Honors Bachelor of Science).

**LV=Level**
The catalog system translates these codes into the following terminology:

01 = Undergraduate
02 = Graduate students
03 = Postbaccalaureate students
04 = Nondegree and Credential
05 = Professional students
06 = INTO OSU GE/AE/Pathways

**Major Restrictions/Major Code Descriptions**
Some courses are restricted to students enrolled in particular majors. Numerical codes of the majors students are restricted to are noted in the Restrictions section in the online Schedule of Classes.
INFORMATION SERVICES, COMPUTERS, AND ACADEMIC TECHNOLOGIES

Information Services supports OSU students by providing accounts, technologies, equipment checkout, printing, computing networks and computing labs. The IS Service Desk provides students with technical support for laptops, mobile devices, and campus systems like Canvas. If you need in-person support, please visit the Walk-up Service Desk in Milne Computer Center room 201.

Student employment opportunities are available from a variety of units within IS, including the IS Service Desk and Academic Technology, with the greatest opportunities announced just prior to each new term.

Accounts and Passwords

Website: https://oregonstate.teamdynamix.com/TDClient/KB/ArticleDet?ID=58474

- Accounts & Technologies Guide for New Students: This guide is for new OSU students who need to get connected to OSU systems such as email and Canvas. Even if you are already connected to one or more OSU systems, we recommend you go through this guide, just to be sure you’ve covered the bases and know where to get computing help.
- ONID: ONID stands for OSU Network ID. It’s a universal computer account available to all OSU students, employees and associates. You use your ONID username and password to access Online Services, Canvas, email, the wireless network and many other university computing services.
- Box: Box is unlimited cloud storage and collaboration for all OSU students and employees.
- G Suite: ONID email is accessed via G Suite. All OSU students, instructors, and employees may access all the supported core apps: Drive, Mail, Calendar, Site and Groups.
- Office365 for OSU: Office365 allows students and employees to download and install up to 5 free copies of Microsoft Office on personal devices and to collaborate online using native Microsoft Office tools: Word, Excel, PowerPoint and OneNote.

Technical Support

- OSU Computer Help Documents (http://oregonstate.edu/helpdocs/), 24/7 help guides and FAQs
- OSU Service Desk (http://is.oregonstate.edu/service-desk/), Monday–Friday support via phone, 541-737-8787, webform, and in-person at Milne Computer Center room 201 (also open on weekends during regular terms)

Student Employment

(Opportunities subject to availability)

Student workers provide programming, development, and support services for the OSU community. Potential employment is contingent upon eligibility per university policy on student employment.

- IS Service Desk
- Technical support, programmers
- Central Web Services
- Web app and mobile app developers
- Customer service and support, system maintenance

See the OSU website (http://jobs.oregonstate.edu) for postings.

Learning Technologies

Website: http://is.oregonstate.edu/learning-technologies

- Canvas, OSU’s Learning Management System used by both off-campus and on-campus students for classwork.
- Classroom Technology Services
- Equipment Loan and Rental
- Standard Printing
- Media Creation

Software

Website: http://is.oregonstate.edu/accounts-support/software

- Many software packages are available to students.
INTO OREGON STATE UNIVERSITY

1701 SW Western Blvd
Corvallis, OR 97333, USA
Phone: +1-541-737-2464
Email: info@oregonstate.edu
Website: http://www.intoosu.oregonstate.edu (http://intoosu.oregonstate.edu/)

Administration
Bob Gilmour, Executive Director, INTO OSU
Julianna Betjemann, Director of Student Experience, INTO OSU
Shain Panzeri, Director of International Admissions and Academic Support, INTO OSU
Elena Sapp, Director of Academic Programs, INTO OSU

Oregon State University offers academic Pathway and English language training programs through the INTO OSU Center. Personalized support tailored to international students’ educational, social and cultural needs prepares them to progress with confidence as degree-seeking students. INTO OSU provides international students with learning experiences and services that promote academic, professional and personal success.

INTO established its first partnership in the U.S. at Oregon State University in 2008. Located in the new International Living-Learning Center, INTO OSU offers outstanding academic programs, technology-assisted learning, a welcoming, interconnected community of students from across the U.S. and the world, strong student support programs and state-of-the-art facilities. The innovative Pathway and English language programs offered at the INTO OSU Center are delivered by highly qualified OSU teaching faculty. INTO OSU also provides a breadth of academic preparation and support services designed specifically to meet the unique needs of its international students.

Facilities
The International Living-Learning Center opened in September 2011 and is the home for INTO Oregon State University. This state-of-the-art building offers a world-class student experience where international and domestic students live and learn together in the heart of the OSU campus. This building includes residential accommodations for more than 300 international and domestic students, 26 classrooms, a large and spacious auditorium, computer labs, a café, market and comfortable open spaces where students can socialize.

Student Services
The INTO OSU Student Services team provides a range of co-curricular programs and services promoting social, personal and academic well being. Upon arrival at OSU, the team helps students settle in to life in Corvallis, provide social opportunities and a variety of resources tailored to the specific needs of international students. Whether it’s a question about making an appointment with a doctor, finding a place to live, renewing your visa or anything else, there will always be someone available to help you.

International Student Orientation
Orientation involves a variety of important events that prepare students to be successful at OSU, including information about maintaining your visa status, registering for OSU classes, health requirements and insurance coverage. Attendance at International Student Orientation is required of all international students, both direct and INTO OSU.

Other important activities during orientation include: opening an OSU email account, getting an OSU ID card, learning about OSU community expectations and taking a tour of the campus. It’s also a great time to make new international and American friends and attend the many social events planned on campus.

Visa and Immigration Support
Upon arrival, the university’s Office of International Services (OIS) office, in conjunction with the INTO OSU Student Services team, will provide information, support and guidance on maintaining your immigration status while you are in the U.S. These can include questions about renewing a student visa, making sure your I-20 or DS-2019 status is always current, bringing your dependents, employment, traveling and more. During your program, in conjunction with the INTO OSU Academic Support and Finance teams, they will support you through your program and issue any documentation you may need to support your visa status. Students can come in for walk-in hours, or make individual appointments with an International Student Adviser or Sponsored Student Adviser at the Office of International Services (OIS). In addition, workshops are held throughout the year on topics such as employment, scholarships and travel.

OSU Office of International Admissions
The OSU Office of International Admissions is housed in the INTO OSU Center. The Office of International Admissions works closely with prospective international students from inquiry to admission for a variety of programs including: Academic English, Pathway Programs (Undergraduate and Graduate), Undergraduate, Post-Baccalaureate, Professional (MBA, PharmD, and DVM), and Non-degree Exchange Students. All other graduate programs (Master’s and PhD) are served by the Graduate School. Visit the Office of International Admissions (http://admissions.oregonstate.edu/international/) online.

Scholarships
Oregon State University and INTO Oregon State University are proud to offer a wide variety of scholarships for exceptional international students. Scholarships are available to undergraduate students, graduate students and Pathway students alike. For more information about these exciting scholarship opportunities, please visit the Office of International Admissions (http://admissions.oregonstate.edu/international/scholarships-international-students/) online. Scholarships are available to undergraduate students, graduate students and Pathway and English language students.

Undergraduate Pathway and Undergraduate Transfer Program (UTP)
These programs combine intensive language study, academic skills development and academic course work in a carefully constructed program designed to prepare students for rigorous OSU degree programs.

The UTP offers customized programs for students who have earned university credits and wish to apply them towards their OSU degree. UTP students receive additional academic, language and cultural support to help be successful at OSU.
The Undergraduate Pathway program and UTP are designed for students who:

- Want to study for an undergraduate degree in the U.S.
- Need to improve their English language skills
- May have lower GPAs than required of direct-entry students
- Desire additional academic, language, and cultural support in order to succeed during their first year at a U.S. university
- Apply previously earned university credit towards graduation at OSU (UTP only)

The Undergraduate Pathway and UTP programs are for students who want to take the fast-track to success. Students receive the highest level of support during their transition abroad, making it an ideal choice for international students who are driven to achieve high academic goals.

**Undergraduate Pathway and UTP programs are available in:**

- Business
- Engineering
- Science
- Computer Science
- Natural Resources and Renewable Materials
- Food Science and Technology
- Exercise and Sport Science
- General
- Public Policy
- Women and Gender Studies
- Design, Apparel and Merchandising Management
- Mathematics
- Psychology

**Four types of Undergraduate and UTP programs are available:**

- **1-term Accelerated Pathway and UTP:** This program is composed of one term of Pathway programming which counts toward the student’s undergraduate degree.
- **2-term Accelerated Pathway and UTP:** This program is composed of two terms of Pathway programming which count toward the student’s undergraduate degree.
- **3-term Standard Pathway and UTP:** Leads students through their first year and upon completion of all progression requirements, students will move on to their degree-seeking program as a second-year sophomore.
- **4-term Comprehensive Pathway and UTP:** Offers an intensive language curriculum for students to start their first year of study, allowing students to progress to their degree program. After successfully completing progression requirements, students will move on to their degree-seeking program as a second-year sophomore.

**Undergraduate Pathway and UTP Core Academic Courses**
The Undergraduate Pathway program and UTP are comprised of OSU credit-earning courses in math, science and writing. From the first day of classes, INTO OSU Pathway and UTP students study alongside domestic students in many of the same courses.

For more information please visit INTO OSU (http://intoosu.oregonstate.edu).

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**Graduate Pathway Program**
The innovative Graduate Pathway program provides international students a direct path to various graduate degrees at the university. Upon successful completion of the program, students are guaranteed progression to a graduate degree program through a curriculum consisting of graduate credit courses that apply to the OSU degree program. The program provides academic, language and cultural support in order to succeed at Oregon State University.

Direct admission to the Graduate School and respective department-based graduate programs at Oregon State University is highly competitive with only the best and most prepared students being selected. Many students who meet all the minimum entry requirements are not admitted because of the highly competitive nature of the programs.

The Graduate Pathway program is designed for international students who:

- Choose to demonstrate their admissibility to an OSU degree seeking program through Graduate Pathway performance in OSU graduate level courses in a specific area of study
- Fall short of meeting the minimum GPA or test score requirements
- Need further English development
- Any or all of the above

**Graduate Pathway Programs are available in:**

- Business Administration (MBA)
- Business (MSB)
- Chemical Engineering (MEng)
- Organic Chemistry (MS)
- Civil Engineering (MEng)
- Comparative Health Sciences (MS/PhD)
- Computer Science (MEng)
- Electrical and Computer Engineering (MEng)
- Environmental Engineering (MEng)
- Environmental Sciences (PSM)
- Industrial Engineering (MEng)
- Mechanical Engineering (MEng)
- Biostatics (MPH)
- Global Health (MPH)
- Health Promotion and Health Behavior (MPH)
- Materials Chemistry (MS)
- Mathematics (MS)
- Biological and Ecological Engineering (MEng)

**Three types of Graduate Pathway Programs are offered:**

- **1-term Accelerated Pathway:** Minimum 9 graduate credits earned in the program
- **2-term Accelerated Pathway:** Minimum 15 graduate credits earned in the program
- **3-term Standard Pathway:** Minimum 15 graduate credits earned in the program

**Graduate Pathway Core Academic Courses**
The academic courses included in the Graduate Pathway programs are carefully chosen to ensure success in graduate-level studies. Students
will be advised on which modules to follow during their academic orientation at the INTO OSU Center.

For more information please visit INTO OSU (http://intoosu.oregonstate.edu).

**Academic English**

**Program Description**
The Academic English program at INTO Oregon State University prepares international students for university study in the U.S. The academically rigorous program provides international students with high-quality English language instruction and the academic skills to succeed at OSU through development of:

- Listening
- Speaking
- Reading
- Writing
- Grammar
- Standardized test preparation
- Academic study skills

**Program Highlights**
- Intensive English to prepare for university study
- Academic advising throughout the program
- Small classes of 18-20 students
- Highly-trained and experienced instructors
- Participation in the Conversant Program
- Use of a fully-equipped Learning Center with state-of-the-art technology

**Program Outcomes**
After finishing this intensive program successful students will be able to:

- Interact comfortably in the U.S. classroom with professors and fellow students
- Understand U.S. values in an academic setting
- Present their spoken and written ideas accurately and effectively in English
- Write research papers with proper use of citations and references
- Use the Internet and OSU library databases to conduct academic research
- Read, understand, and critically evaluate academic texts
- Understand and use vocabulary common to academic disciplines
- Take useful and accurate notes in academic lectures and presentations
- Develop and deliver oral presentations

**Study Abroad with INTO OSU**

**Program Description**
Study Abroad at INTO OSU is designed for students who want one or more terms of study abroad experience at a top US university. The program provides students with a classic American university experience while taking a variety of classes. Students will have access to all the support services available at the university and INTO OSU, including exceptional one-on-one tutoring, social and cultural trips and more.

The length of the Study Abroad program will vary depending on a student’s needs. The program can be customized for different levels of English and for specific academic interests. There are fall, winter, spring and summer start dates available. Additional program and admission information can be found online (http://admissions.oregonstate.edu/international/programs/study-abroad-osu/).

With prior approval from your home university, the academic courses you will study at OSU can be used to gain credits toward your undergraduate degree in your home country. This program is not designed as a route to degree-seeking OSU programs, though your credits may apply to an OSU degree if you seek admission.

This program consists of three parts:

**Study Abroad with English (SAWE) Part 1**
Students study full-time in the Academic English program. Students have an opportunity to progress to Study Abroad with English Part 2 upon successful completion of Academic English level 4 and meeting internal progression criteria.

**Study Abroad with English (SAWE) Part 2**
Students are able to select from OSU undergraduate credit bearing courses offered by the College of Liberal Arts and study alongside domestic and international students while continuing to take 6-12 hours of academic English classes. Students have an opportunity to progress to the Visiting International Students Program upon successful completion of Academic English core level 6 courses or ALS 161/ALS 162 and meeting internal progression criteria.

**Visiting International Students Program (VISP)**
Students can select from a range of OSU credit-bearing courses offered by the College of Liberal Arts. Optional academic English courses are also available.

All OSU undergraduate College of Liberal Arts courses taken through the VISP and SAWE Part 2 program are transferrable with prior approval from the student’s home university (except intensive English courses, if selected).

Departmental approval is required for students seeking to register for a course outside the College of Liberal Arts.


MUSEUMS, GALLERIES, AND COLLECTIONS

The educational resources of the university include art, galleries, collections, and exhibits of cultural and scientific materials. Research, teaching, and extension functions are combined in these collections, which serve both the institution and the general public.

Over the years, various departments and schools of the university have become repositories for extensive holdings of manuscripts; rare books; prints, paintings, and other art objects; costumes; textiles; historic artifacts; archaeological material; fossils; preserved plants and animals; wood products; and marine material. These collections serve many of the same functions as a library or make possible the identification of materials whose age, name, or significance is unknown.

Most university collections serve primarily research and teaching functions and may be viewed by prior appointment with their curators.

- Archaeological Collection: Consists of artifacts, field notes, maps, drawings, sketches, and photographs accumulated in archaeological investigations. Several thousand items of primary archaeological documentation comprise this collection. Location: Waldo Hall.

- Art About Agriculture ([https://agsci.oregonstate.edu/art/art-about-agriculture/](https://agsci.oregonstate.edu/art/art-about-agriculture/)): Recognizes professional and emerging Pacific Northwest artists, creating a growing, dynamic, permanent collection of fine art based on, stimulated by, and portraying agriculture, and presents the permanent collection and tour exhibit to rural and urban audiences.

- College of Business-Design Collection ([https://business.oregonstate.edu/sdhe/historic-collection/](https://business.oregonstate.edu/sdhe/historic-collection/)): The collection, with display cases on the 2nd floor of Milam Hall, supports the outreach missions of the College of Business Design Programs by providing an educational resource and creative inspiration for students, researchers, and the general public.

- Department of Fisheries and Wildlife's Mammals and Fishes Collections: Include more than 9,000 specimens of birds and 10,000 specimens of mammals, as well as the Braly Ornithological Collection; Overton Dowell, Jr., Bird Collection; Alex Walker Ornithological Collection; and Oregon Game Commission Collection. Location: Nash Hall.

- Fairbanks Art Gallery ([https://liberalarts.oregonstate.edu/sac/art-and-art-history/fairbanks-galleries/fairbanks-gallery-art/](https://liberalarts.oregonstate.edu/sac/art-and-art-history/fairbanks-galleries/fairbanks-gallery-art/)): Fairbanks Gallery of Art is Oregon State University's professional art gallery. Its mission is to initiate, produce, and present scholarly visual art exhibitions to advance contact and dialogue with original works of art as an indispensable part of liberal art education. The exhibition programming of the gallery reflects the diversity of visual-art practices and cultures, fostering critical thinking, and reflecting the depth and breadth of human experience. The exhibitions support the educational missions of Art and Art History and broaden the dialogue across University communities, including general audiences.

- Fine Arts Print Collection ([https://oregondigital.org/sets/fairbanks/](https://oregondigital.org/sets/fairbanks/)): Contains nearly 600 prints representing numerous countries and spanning several centuries. The collection's holdings includes work of various styles, including Japanese Ukiyo-e, modern Japanese woodblock, 20th century Latin American, German Expressionism, and 20th century American prints.

- Geological Collections: Include minerals, rocks, and fossils. The Edward Taylor Mineral Collections (F. Tepley, Curator) contain several thousand rare and fine specimens. Over 5,000 fossil specimens of Paleozoic, Mesozoic, and Cenozoic marine invertebrates comprise the outstanding John H. Howard and Earl L. Packard Collections in Paleontology (A.G Grander, Curator). Location: Wilkinson Hall.

- The Herbarium ([http://oregonstate.edu/dept/botany/herbarium/](http://oregonstate.edu/dept/botany/herbarium/)): Contains more than 450,000 named specimens of seed plants, ferns, mosses, algae, fungi, and lichens. Emphasis is on collections from western North America. The herbarium is the repository for the Morton E. Peck Herbarium of Willamette University, a research collection of Oregon flora consisting of more than 30,000 sheets, and the former University of Oregon herbarium.

- Herpetology Collection ([http://people.oregonstate.edu/~arnoldst/herp%20collection.htm](http://people.oregonstate.edu/~arnoldst/herp%20collection.htm)): Consists of more than 60,000 ethanol-preserved amphibians and reptiles, and approximately 24,000 frozen tissue samples. The collection has excellent representation for sites in the Pacific Northwest and includes the largest collection of garter snakes (Thamnophis) in the world.

- The J.C. Braly Natural History Collection: Includes 550 mounts of birds and mammals in addition to over 1,000 preserved specimens of amphibians and reptiles from the Pacific Northwest. Location: Cordley Hall.

- The LaSells Stewart Center Galleries ([https://lasells.oregonstate.edu/gallery/](https://lasells.oregonstate.edu/gallery/)): Offer visitors the opportunity to experience three distinct art galleries: Giustina Gallery, Murdock Gallery, and South Hall Display Case. Collectively, the galleries provide the local and campus community diverse opportunities to view and display art work. Annual exhibits include: Vista and Vineyards, Art about Agriculture, Cultural Connections Exhibit and the Community Art Exhibit.

- The Little Gallery ([https://liberalarts.oregonstate.edu/feature-story/little-gallery-presents/](https://liberalarts.oregonstate.edu/feature-story/little-gallery-presents/)): Exhibits eclectic selections of art from well-established and emerging artists and visually advances different critical methods of seeing, crucial and transformative approaches to large intercultural questions. The gallery has a welcome place in an international language department, is bringing cultures together and has become a confluence of disciplines, a place for discussion and wonder.

- Memorial Union Art Collection ([https://mu.oregonstate.edu/gallery/](https://mu.oregonstate.edu/gallery/)): Currently among the 125 artists included in the collection are paintings and sculptures by J. Leo Fairbanks, works from the early nineteen hundreds by Carrie Gilbert depicting Native Americans, prints collected and donated by Gordon and Vivian Gilkey, and historic photographs of OSU (a number of which are on display in the mezzanine hall).

- Memorial Union Concourse Gallery ([https://mu.oregonstate.edu/art-gallery/](https://mu.oregonstate.edu/art-gallery/)): One of the largest exhibition spaces on the OSU Campus. Several contemporary art exhibits reflecting a diversity of styles, media and cultural perspectives are scheduled throughout the year. These exhibits feature the artwork of international, regional, local recognized artists, and the art of talented OSU students.

- Oregon State Arthropod Collection ([http://osac.oregonstate.edu/](http://osac.oregonstate.edu/)): A valuable research collection of nearly three million insect and mite
specimens, chiefly from the Pacific Northwest. Collection strengths include Coleoptera, Hemiptera, Lepidoptera, and Hymenoptera. Location: 4082 Cordley Hall.

- Special Collections and Archives Research Center (http://scarc.library.oregonstate.edu/): Include collections pertaining to the history of science and technology; the historical records of OSU and papers of its prominent faculty members; collections documenting cultural and ethnic groups in Oregon; rare book collections; and collections documenting natural resources in the Pacific Northwest, especially agriculture and forestry.

- Valley Library NW Art Collection (https://library.oregonstate.edu/nwart/): Consists of more than 140 contemporary artworks by leading Northwest artists, including current and former art faculty members at OSU. The majority of the works were added to the collection during the 1999 library renovation through the Oregon Percent for Art law and selected in collaboration with the Oregon Arts Commission.

- Visitor Center of the OSU Marine Science Center (https://seagrant.oregonstate.edu/visitor-center/): Features aquariums, interactive exhibits, and hands-on displays that bring to life the marine research conducted by OSU scientists. Special events, educational programs, guided tours and walks are available on request to teach visitors about the ocean and its inhabitants, from undersea volcanoes to the tiniest tide pool creatures.

- The Xylarium (Wood Collection): Contains approximately 2,500 species of wood, primarily from North and South America, Southeast Asia, and Africa.
OSU OFFICE OF GLOBAL OPPORTUNITIES (OSU GO)

Caine Francis, Director
University Plaza
1600 SW Western Blvd., Suite 290
Oregon State University
Corvallis, Oregon 97333
Phone: 541-737-6434
Website: http://international.oregonstate.edu/osugo

OSU Office of Global Opportunities (OSU GO) is the centralized hub for supporting students and faculty who wish to explore, travel, study, and go global: whether studying abroad in diverse countries, participating in specialized international internships, joining service-learning and experiential programs that delve into unique projects and communities, and/or conducting comprehensive and rigorous international research.

Overseas Study and Internship Programs

OSU students may broaden their education by taking part in one or a number of OSU GO’s international study programs. Many of the programs allow qualified students from a wide variety of disciplines to earn academic credit from Oregon State University while pursuing their studies internationally. For academic programs approved for OSU credit, financial aid may apply to help cover the costs. IE3 Global is the program development unit within OSU GO to support the strategic mission of education abroad.

IE3 Global offers wide and diverse program options for OSU: direct exchange, study abroad, faculty-led, international internships and research, and supports faculty sabbatical opportunities. Furthermore, IE3 Global partners with colleges and departments on new program opportunities, development, and implementation that align with OSU’s strategic internationalization goals and evolving international curriculum.

More information about OSU GO programs can be obtained by writing to caine.francis@oregonstate.edu or calling 541-737-6434.

Course Equivalency Database:

To assist students and academic advisors in the planning process, OSU GO manages a database of credits earned by OSU students participating in education abroad programs.
A312, A322, B306 and B308 Kerr Administration Building
Oregon State University
Corvallis, OR 97331-2140
Phone: 541-737-3467
Email: researchsupport@oregonstate.edu
Website: http://research.oregonstate.edu/

Administration

Cynthia Sagers, Vice President for Research
Roy Haggerty, Associate Vice President for Research, 541-737-8390, roy.haggerty@oregonstate.edu
Mark Peters, Interim Director, Office of Research Integrity, 541-737-0647, mark.peters@oregonstate.edu
Patricia Hawk, Assistant Vice President, Office for Sponsored Research and Award Administration, 541-737-4933, patricia.hawk@oregonstate.edu
Brian Wall, Assistant Vice President for Research, Commercialization and Industry Partnerships, Office for Commercialization and Corporate Development and Oregon State University Advantage, 541-737-9058, brian.wall@oregonstate.edu
Susan Emerson, Research Development Associate, 541-737-1755, susan.emerson@oregonstate.edu

The Research Office

Oregon’s State University is one of only two land, sea, space and sun grant institutions in the U.S., holds top tier research designation from the Carnegie Foundation, and is the state’s largest public research university. Oregon State research exceeded $308 million dollars in fiscal year 2015, with private sector funding totaling approximately $40 million.

The OSU Research Agenda, integrated with the university’s strategic plan, guides faculty inquiry in OSU’s three signature areas of distinction: Advancing the Science of Sustainable Earth Ecosystems; Improving Human Health and Wellness; and Promoting Economic Growth and Social Progress.

Headed by the vice president for research, the Research Office serves faculty involved in research, innovation, scholarship, and creativity in all OSU colleges and in a variety of multidisciplinary centers, institutes and programs. The office provides support to secure funding, comply with regulations, partner with industry, establish collaborations across the university and raise the profile of OSU.

Programs, Offices and Centers

Incentive Programs (http://research.oregonstate.edu/incentive/): The General Research Fund is for projects not otherwise supported by organized or directed programs. Faculty Release Time provides funding for developing external grant proposals or furthering scholarly activities. Research Equipment Reserve Funds help acquire, repair, renovate, or improve equipment. The Undergraduate Research, Innovation, Scholarship and Creativity Fund enables students to initiate scholarly relationships with faculty early in their academic careers.

Advantage (http://advantage.oregonstate.edu/home/): OSU Advantage connects business with faculty expertise, student talent and world-class facilities to research solutions, bring ideas to market and launch companies. OSU Advantage helps faculty take their research and projects into the marketplace where they can have real-world impacts, and provides opportunities to new sources of funding to carry on important and impactful work. Three aligned organizations offer this opportunity: Advantage Accelerator, Advantage Partnerships, and Advantage Impact.

Office of Research Integrity (http://research.oregonstate.edu/ori/): The ORI works with OSU faculty, staff, and students to help assure proper conduct of research in areas pertaining to the use of human subjects, and non-human vertebrate animals. The office also works with faculty and Academic Affairs to identify and appropriately manage issues that could be perceived to present financial conflicts of interest. The university’s Small Boat and Diving Safety programs are overseen by the office, as are issues related to technology export controls. The ORI’s purpose is to facilitate the research efforts of OSU faculty, staff and students by helping them to remain compliant with the many federal and state research regulations that assure the integrity of research, the safety of all, and the ethical treatment of human and animal subjects.

Office of Sponsored Research and Award Administration (http://research.oregonstate.edu/osraa/) (OSRAA) (http://research.oregonstate.edu/osraa/): OSRAA has central responsibility for proposal submission for sponsored research, scholarship, instructional and other activities at Oregon State and contractual compliance as it relates to sponsored activities. OSRAA balances service to OSU faculty and staff, university administration, and the numerous organizations that sponsor Oregon State University activities. Functions include proposal review, monitoring institutional compliance with terms and conditions, official institutional signatory, policy and procedure development, training, compliance activities related to research administration, and general funding opportunity assistance.

Office for Commercialization and Corporate Development (OCCD) (http://advantage.oregonstate.edu/advance-impact/): The OCCD leads OSU’s industry-sponsored research efforts and the commercialization of OSU innovations by evaluating markets, developing an intellectual property protection strategy and executing research, confidentiality, materials transfer, licensing and other industry agreements. The OCCD is the bridge to commercial entities—from Oregon-based startups to large international companies, the OCCD facilitates OSU research to impact the world.

Office for Research Development (ORD) (http://research.oregonstate.edu/ord/): The ORD provides leadership in strategic planning, implementation, coordination, and review of large research proposals across campus, and manages the University Limited Submission process. The primary responsibilities of the ORD are to identify and develop new external funding sources, increase funding support for the university, facilitate the development of research partnerships, research future grant opportunities, and provide education for faculty and administrators to encourage applications for grant funding.

Multidisciplinary Centers and Institutes (https://research.oregonstate.edu/research-centers-and-institutes-osu-0/): Addressing many of the world’s most pressing challenges requires collaborative efforts of scientists, engineers, social scientists, and humanists to attain long-lasting, high impact results. OSU fosters these dynamic transdisciplinary collaborations through a variety of centers, institutes and programs. With particular strengths in material sciences, ocean and earth sciences, enterprise innovation and economic development, health sciences, and natural resources, OSU investigators, representing virtually every college on campus, team to conduct cutting-edge research, provide undergraduate and graduate education, and
proactively engage communities throughout Oregon and the world in helping them address their greatest needs.

**Center for Genome Research and Biocomputing**

Brett Tyler, Director  
Website: http://cgrb.oregonstate.edu/

Facilitates the development, application and training in computationally intensive, genome-enabled research at OSU and across the state. Research in the CGRB and faculty affiliate laboratories seeks to improve health, better utilize natural and agricultural resources, understand our global environment, and develop new bio-based products and energy sources. The center offers leadership and services to faculty, staff and students through core laboratories, computational facilities, seminars and technology workshops, and conferences. It also provides a focal point for researchers to establish contacts, initiate collaborations, and apply new technologies in their own laboratories.

**Center for Latino/a Studies and Engagement**

Ana Gómez-Diazgranados, Associate Director of Outreach and Engagement  
Email: Ana.Gomez@oregonstate.edu (Daniel.Lopez-Cevallos@oregonstate.edu)

Daniel López-Cevallos, Associate Director of Research  
Email: Daniel.Lopez-Cevallos@oregonstate.edu

Website: http://liberalarts.oregonstate.edu/centers-and-initiatives/center-latino-studies-and-engagement/  
http://liberalarts.oregonstate.edu/centers-and-initiatives/center-latino-studies-and-engagement/

The mission of the Center for Latino/a Studies and Engagement is to promote engaged research and outreach devoted to advancing knowledge and understanding of Latinx life chances and the issues shaping their lived experiences in our state, region and beyond. The overarching goal of the center are to promote excellence in engaged research, teaching, and outreach in Latinx Studies; to establish an action-based agenda which will promote the economic, political, physical, and educational well-being and development of the Latinx community in rural and urban Oregon; to serve as a model for enhancing the university’s capabilities in similarly targeted research and engagement efforts; and to foster engaged research that is collaborative, trans-disciplinary, and community oriented; furthering both theoretical and applied knowledge to solve real-world problems.

**Center for Research on Lifelong STEM Learning**

Martin Storksdieck, Director  
Email: Storksdieck@oregonstate.edu  
Website: http://stem.oregonstate.edu/

Works to improve understanding of how all people learn STEM throughout the lifespan and across formal and informal settings. The center works across campus to enhance OSU’s capacity to conduct applied research on learning and education in STEM disciplines (Science, Technology, Engineering and Mathematics), and to provide OSU with the insights from past and current research on STEM learning. It serves a diverse and decentralized community of those who engage in STEM, or use learning research at OSU, by functioning as a central hub and institutional support structure. The center represents OSU STEM learning research at state, national and international levels.

**The Center for the Humanities**

Christopher McKnight Nichols, Director  
Joy Jensen, Coordinator  
Website: http://oregonstate.edu/dept/humanities/

Primarily concerned with the advancement of interdisciplinary humanities research and provides fellowships to visiting scholars and OSU faculty members engaged in research and writing projects in literature, history, philosophy, foreign languages, and related humanities fields. Fellowship applications are screened by an advisory board made up of former fellows and OSU faculty from the College of Liberal Arts. The Humanities Center also hosts or co-sponsors research conferences, seminars, films, lectures, and other public programs in the humanities. The Humanities Center’s fundamental concern is the advancement of humanities research, teaching, and public presence at OSU.

**Cooperative Institute for Marine Resources Studies**

Michael A. Banks, Director  
Website: http://hmsc.oregonstate.edu/cimrs/

Established in 1982 to foster collaborative research between the National Oceanic and Atmospheric Administration (NOAA) and Oregon State University in fisheries, aquaculture, oceanography, and related fields. It also encourages education and training of scientists in disciplines related to marine resources. Administered through the Vice President for Research, the institute is the academic home for a staff of 25 to 45 (total) research assistants, associate and full professors, research associates, and faculty research assistants and students. Headquartered at the Hatfield Marine Science Center in Newport, the institute hosts collaborative research with various NOAA investigators within DAR, NOS and NMFS, specifically, the Pacific Marine Environmental Laboratory, the Northwest Fisheries Science Center and the Alaska Fisheries Science Center, the West Coast Regional Office, as well as researchers from a broad range of colleges and departments within the entire OUS system.

**Environmental Health Sciences Center**

Joseph Beckman, Director  
Website: http://ehsc.oregonstate.edu/

Established in 1967 with funding by the National Institute of Environmental Health Sciences (NIEMS). As an organizational unit under the vice president for research, it provides resources for coordination and stimulation of interdisciplinary basic research and training related to the effects of environmental factors on human health. The EHS Center currently brings together and uses a variety of professional capabilities of research and teaching faculty, staff, and students from numerous OSU departments, schools, and colleges within OSU. Academic areas include chemistry, biochemistry and biophysics, environmental and molecular toxicology, microbiology, molecular and cell biology, food science and technology, fisheries and wildlife, veterinary medicine, pharmacology, zoology, and statistics. The center’s visiting scientists program complements research expertise in these areas.
Hatfield Marine Science Center

Robert Cowen, Director
2030 SE Marine Science Drive, Newport, OR 97365
Phone: 541-867-0212 (Director’s Office)
Email: HMSCmainoffice@oregonstate.edu
Website: http://hmsc.oregonstate.edu/

HMSC has over 50 years of accomplishment in research, education, and outreach. Originally established as a marine laboratory for Oregon State University, it has grown to encompass a large group of partners on its 49-acre site on Yaquina Bay in Newport, Oregon. Within OSU, HMSC includes researchers, students, and faculty from six colleges. It serves as home to several university programs, including the Coastal Oregon Marine Experiment Station, the Cooperative Institute for Marine Resources Studies, and the Marine Mammal Institute. It also includes important components of the Oregon Sea Grant program and the Northwest National Marine Renewable Energy Center. Our onsite partners include six state and federal agencies involved in research and management of the marine environment, and our cooperation includes faculty appointments for agency staff, as well as opportunities for students to work with agency scientists.

Institute for Natural Resources

Lisa Gaines, Interim Director
Phone: 541-737-9918 (Main Office)
Website: http://inr.oregonstate.edu/

Created by the Oregon Legislature with the Oregon Sustainability Act of 2001, the INR is a cooperative enterprise bringing the scientific knowledge and expertise of the Oregon University System and other Oregon higher education institutions to bear on natural resource management. Designated as the lead university to administer INR, Oregon State University (OSU) established INR as a research institute within OSU to help decision-makers identify and use relevant science in making policy choices. At INR’s foundation is the land grant mission — building bridges between theory and practice and effectively communicating knowledge to decision-makers.

Institute for Water and Watersheds

Todd Jarvis, Director
Kathryn Motter, Laboratory Manager
Phone: 541-737-9918
Email: iww@oregonstate.edu
Website: http://water.oregonstate.edu/

Since water is ‘virtually’ embedded in all Oregon products, whether natural or manufactured, the state’s economic vitality is tied directly to water. Water quantity and quality issues in the Willamette and Klamath Basins are two of the state’s top environmental priorities. The Institute for Water and Watersheds (IWW), Oregon’s federally-designated water resources research institute, has over 125 affiliated faculty and pursues solutions to Oregon’s water problems by assembling research teams from a broad spectrum of disciplines. The institute utilizes educational and outreach models to communicate the latest water science and policy options to stakeholders so that they can make informed intelligent decisions. The IWW’s Water Collaboratory, an open analytical chemistry laboratory, provides faculty, staff, and students with a variety of analytical capabilities.

Laboratory Animal Resources Center

Helen E. Diggs, MEd, DVM, DACLAM
Director and Campus Attending Veterinarian
101 Laboratory Animal Resources Center
Corvallis, Oregon 97331
541-737-6213
Email: larc@oregonstate.edu
Website: http://oregonstate.edu/dept/larc/

Supports and manages the care and veterinary oversight of vertebrate animals used in instruction, research, production, and testing on the Oregon State University campus and property throughout the state. As the leading public research university in Oregon, the campus community is held to the highest standards of responsible animal care. The LARC staff is composed of veterinarians, animal technicians, and veterinary technicians all with specialty training and certifications specific to laboratory animal medicine. LARC employees are committed to providing an exemplary animal oversight program. This includes assured humane care and use of animals through quality veterinary oversight, husbandry, social housing and environmental enrichment. The LARC staff facilitates campus research and instructional collaborations, through consultation, training, and provision of professional technical and clinical services, and by maintaining compliance with applicable federal and state regulations. The LARC upholds the university’s academic mission and commitment to public service.

Linus Pauling Institute

Balz Frei, Director
307 Linus Pauling Science Center
541-737-5075
Email: lpi@oregonstate.edu
Website: http://lpi.oregonstate.edu/

The Linus Pauling Institute was co-founded in 1973 by Linus Pauling, the only individual to win two unshared Nobel Prizes (Chemistry, 1954; Peace, 1962). The institute moved to the campus of Oregon State University (Dr. Pauling’s undergraduate alma mater) in 1996 and now operates as one of the university’s research centers and institutes. Researchers at the Linus Pauling Institute investigate the role that vitamins and essential minerals (micronutrients) and chemicals from plants (phytochemicals) play in human aging, immune function, and chronic diseases, especially heart disease, cancer, and neurodegenerative diseases. A major emphasis is to understand the role of oxidative stress and inflammation in disease etiology, and the preventive effects of dietary constituents with antioxidant or anti-inflammatory properties.

Northwest National Marine Renewable Energy Center

Belinda Batten, Director
Phone: 541-737-9492
Email: belinda.batten@oregonstate.edu
Website: http://nnmrec.oregonstate.edu/

The NNMREC is a U.S. Department of Energy-sponsored partnership between Oregon State University (OSU), the University of Washington
and monitoring. Facilities for radiation work include teaching and detectors; and a variety of instruments for radiation measurements.

2,500 megawatts in the pulsing mode); a cobalt-60 gamma irradiator; a natural dimensions of coastal and marine fisheries, and cultural beliefs, elementary through university levels.

2,500 megawatts in the pulsing mode); a cobalt-60 gamma irradiator; a natural dimensions of coastal and marine fisheries, and cultural beliefs, elementary through university levels.

The Radiation Center is a campus-wide instructional and research facility specially designed to accommodate programs involving the use of radiation and radioactive materials. Located in the center are major items of specialized equipment and unique teaching and research laboratories with up-to-date instrumentation and related equipment for performing neutron activation analysis and radiotracer studies; laboratories for plant experiments involving radioactivity; an instrument calibration facility for radiation protection instrumentation; and facilities for packaging radioactive materials for shipment to national and international destinations.

Superfund Research Center
Robert Tanguay, Director
Email: robert.tanguay@oregonstate.edu
541-737-6514
Website: http://superfund.oregonstate.edu/

The Superfund Research Center oversees the NIEHS-funded Superfund Research Program grant at Oregon State University. This grant supports a multidisciplinary research effort to address the re-emerging health threat of polycyclic aromatic hydrocarbons (PAHs) in the environment. PAHs are considered a re-emerging threat to environmental health due to the increased burning of fossil fuels (e.g., coal and petroleum products) for energy production. The SRP grant supports five research projects and six support cores at Oregon State University and Pacific Northwest National Laboratory in Richland, WA, in a range of efforts involving human exposure to PAHs. In addition, research partners are located at San Diego State University, the Confederated Tribes of the Umatilla Indian Reservation and Pennsylvania State University. These research projects focus on determining the effect of PAHs on a variety of adverse human health outcomes employing animal models such as zebrafish to detect developmental toxicities.

Oregon Nanoscience and Microtechnologies Institute
Skip Rung, President and Executive Director
Phone: 541-713-1331
Email: skip@onami.us
Website: http://onami.us/

ONAMI is Oregon’s first ‘signature research center’ for the purpose of sustaining and growing Oregon’s innovation economy. As is true of only three other states, technology is Oregon’s largest employer, with an average wage twice the statewide average. Growth of these kinds of job opportunities is the single most effective thing we can do for state financial health, schools, public safety and human services.

Our strategy has been 10 years in the making, and the selection of ‘nanoscience and microtechnologies’ was based on a careful analysis intended to discover the largest possible intersection among:

- nationally competitive research in our universities,
- future commercial opportunities/growing sectors of the national economy,
- the existing skills of Oregon industry and its surrounding value chain ecosystem.

ONAMI is now a nationally recognized model for state innovation initiatives, and is frequently featured at events and in publications by the National Science Foundation, National Governors Association, and other organizations concerned with keeping the United States competitive in the global innovation economy.
The state of Oregon so far has invested $47 million in ONAMI, including $5.2 million from the Oregon Innovation Council (OECDD) for fiscal year 2012–2013. These funds are invested in OSU research and commercialization capacity in the form of matching funds for competitive extramural proposals, facility operations, and ‘gap’ grants to assist in the formation of successful new products and startup companies.

Oregon BEST funds and supports innovative cleantech startups across Oregon. As an economic development catalyst, Oregon BEST connects startups with state and federal resources while preparing them for follow-on investment through a series of focused programs.

We invest strategically in public-private partnerships that rapidly transform university research into new clean technologies, companies, and jobs. The research, projects, and startups we support serve as a proving ground for leading-edge clean technologies while powering a vibrant innovation ecosystem.

Oregon BEST’s work not only adds value and enhances competitiveness for Oregon businesses, it also grows the state’s research revenue, expands research programs, enhances workforce development, and positions Oregon to recruit new cleantech companies.

Since its establishment as an independent, nonprofit organization by the Oregon Legislature in 2007, Oregon BEST’s 270+ Member Researchers (http://oregonbest.org/portfolio/) have attracted more than $135 million in research revenue to Oregon from federal, industry, and foundation sources. Building on Oregon’s international reputation as a sustainability innovator, Oregon BEST offers a range of programs, expertise, and research facilities described below.

Oregon BEST supports a network of nine shared-user research facilities (http://oregonbest.org/what-we-offer/expertise/labs/) at Oregon State University, Portland State University, and the University of Oregon. These multi-million dollar labs offer our industry partners access to research tools, faculty expertise, and workforce development opportunities. The labs help Oregon businesses compete while helping universities grow research and educate graduates. By providing both financial and leadership support, Oregon BEST works to ensure that our community has access to advanced research facilities.

Agricultural Experiment Station

Daniel J. Arp, Director
William G. Boggess, Executive Associate Director
W. Daniel Edge, Associate Director
Joyce Loper, Associate Director
John R. Talbott, Assistant Director
Jack Breen, Agricultural Sciences and Marine Sciences Business Center Manager
Email: AESsupport@oregonstate.edu
Website: http://agsci.oregonstate.edu/research/research (http://agsci.oregonstate.edu/research/research/)

A statewide research network of Oregon State University scientists working on the Corvallis campus and at 11 branch stations in the major crop, climate, and marketing areas of Oregon. These diverse locations ensure that the station’s research program is close to the people and the needs of Oregon’s agricultural and natural resources. Founded July 1, 1888, in accordance with the federal Hatch Act of 1887, the mission of the Oregon Agricultural Experiment Station is to conduct research and demonstrations in the agricultural, biological, social, and environmental sciences that contribute to the economic, environmental, and social welfare of Oregon.

College of Engineering Research and Economic Development Office

Irem Y. Tumer, Associate Dean for Research and Economic Development
Website: http://red.engr.oregonstate.edu/

RED at the College of Engineering was established to promote and support research programs and faculty. The overall mission of the RED office is to build new bridges between faculty, external stakeholders and collaborators, help faculty find and apply for funding opportunities, boost the college’s reputation for research, and grow industry funding. We specifically aim to foster high-impact research initiatives among our faculty, and develop strong relationships with our academic, industry, and government partners. This includes not only connecting faculty teams with funding opportunities and matching industry needs with Oregon State expertise, but also assembling teams that can build new programs in emerging areas that are responsive to global challenges.

Aquaculture Collaborative Research Unit

Hillary S. Egna, Director
Websites: http://aquafishcrsp.oregonstate.edu/ and http://pdacrsp.oregonstate.edu/

The Aquaculture Unit, a center within the College of Agricultural Sciences since 1999, has served as the home for international aquaculture programs such as the Feed the Future Innovation Lab
for Collaborative Research on Aquaculture & Fisheries (formerly AquaFish CRSP), the Aquaculture Best Management Practices for Strategic Investment in Rapid Technology Dissemination project, the Aquatic Resource Use and Conservation for Sustainable Freshwater Aquaculture and Fisheries Project (USAID Mali/Bamako Mission), a USAID Cairo Mission Aquaculture Project, the Aquaculture CRSP, the Pond Dynamics/Aquaculture (PD/A) CRSP and other projects. These diverse international aquaculture programs have been knitted together under independent grants, and have shared a common goal to reduce poverty in developing countries by improving access by the poor to fish and water resources. The Unit has worked with nearly 600 U.S. and host country universities, government, private companies, and non-governmental organizations to support research, development, and outreach activities in 34 countries including Bangladesh, Belize, Brazil, Bolivia, Burma, Cambodia, China, Colombia, Costa Rica, Ecuador, Egypt, El Salvador, Ghana, Guatemala, Guyana, Honduras, Indonesia, Kenya, Laos, PDR, Malawi, Mali, Mexico, Nepal, Nicaragua, Panama, Peru, Philippines, Rwanda, South Africa, Tanzania, Thailand, Uganda, U.S.A., and Vietnam. 

**Forest Research Laboratory - Institute for Working Forest Landscapes**

**Thomas Maness**, Director  
**Anthony S. Davis**, Associate Director  
**Roger D. Admiral**, Associate Director  
Website: [http://www.forestry.oregonstate.edu/research/forest-research-laboratory](http://www.forestry.oregonstate.edu/research/forest-research-laboratory/)

Research in the College of Forestry (CoF) is conducted under the broad umbrella of the Forest Research Laboratory (FRL), which was established by the Oregon Legislature in 1941. The FRL is partially funded by the Legislature as one of three Statewide Public Service Units (see Oregon Revised Statute 526.225). Faculty, staff, and students from the College of Forestry’s Departments of Forest Engineering, Resources, and Management; Forest Ecosystems and Society; and Wood Science and Engineering contribute to a diverse portfolio of fundamental and applied research and outreach activities. In November 2013, the college launched the Institute for Working Forest Landscapes (IWFL) to focus FRL research programs on innovative approaches for managing landscapes that will enhance people’s lives and improve the health of communities, businesses and vital ecosystems. The IWFL’s program is organized under four broad thematic areas: Healthy People and Communities, Resilient Ecosystems, Intensively Managed Forests, and Competitive and Innovative Products.

**Integrated Plant Protection Center**

**Paul Jepson**, Director  
Website: [http://www.ipmnet.org/](http://www.ipmnet.org/)

IPPC was established in 1991, to expand upon the range of activities of the International Plant Protection Center, that was chartered by Oregon State University in 1969. The IPPC is partially supported by the Agricultural Experiment Station, and the Cooperative Extension Service. The IPPC focuses upon research, education and outreach activities associated with the adoption of sustainable integrated pest management (IPM) practices in agriculture. It is the home for a number United States Department of Agriculture (USDA)-funded programs associated with pest control and pesticide management, including the state IPM program, the Regional Pest Management Center program, the Pesticide and Environmental Stewardship program, and the Farm Safety program.

**Inter-University Consortium for Political and Social Research**

**Valery King**, Official Representative (OSU Libraries)  
Website: [http://www.icpsr.umich.edu/icpsrweb/](http://www.icpsr.umich.edu/icpsrweb/)

Through funding provided by OSU Libraries, OSU is a member of ICPSR, the Inter-University Consortium for Political and Social Research. A unit within the Institute for Social Research at the University of Michigan, ICPSR was established in 1962 and maintains and provides access to a vast archive of social science data for research and instruction. OSU students, faculty and staff may access these data at no charge and may also deposit their own data into the collection. ICPSR offers members reduced fees to attend the Summer Training Program in Quantitative Methods of Social Research, a comprehensive curriculum of intensive courses in research design, statistics, data analysis, and social methodology. Additionally ICPSR leads several initiatives that encourage use of data in teaching, particularly for undergraduate instruction, and offers user support to assist researchers in identifying relevant data for analysis and in conducting their research projects.

**Kiewit Center for Infrastructure and Transportation**

**Jason Weiss**, Director  
Email: kiewit.center@oregonstate.edu  
Website: [http://cce.oregonstate.edu/research/](http://cce.oregonstate.edu/research/)

The center was initially established in 1962 as the Transportation Research Institute. The Kiewit Center serves as the umbrella organization for all research within the School of Civil and Construction Engineering. The center is a key component in the College of Engineering’s drive to become a top 25 engineering program, coordinating multi- and interdisciplinary research projects. For the last 150 years, civil engineers have built the infrastructure upon which American prosperity rests. Roads, bridges, airfields, dams, schools, and safe drinking water form the foundation for our quality of life. Today that foundation is crumbling. Americans experience this deterioration every day. A recent report by the American Society of Civil Engineers confirms what most Americans already know—the ASCE report gave the U.S. infrastructure an overall grade of D+. The center is an interdisciplinary unit that provides research, education and public service related to the built environment and the systems that operate in that environment.

**Marine Mammal Institute**

**Bruce Mate**, Director  
Website: [http://mni.oregonstate.edu/](http://mni.oregonstate.edu/)

A multi-disciplinary faculty incorporating the work of academics from engineering, genetics, fisheries and wildlife (agriculture), aquatics, ecology, veterinary medicine, biology, and communications.

- Whale Telemetry Group (WTG): Using satellite-monitored radio tags to determine the distribution and critical habitats of endangered whales.
• Cetacean Conservation and Genomics Laboratory (CCGL): Exploring the genomes of whales and dolphins to understand the past, assess the present, and conserve the future.
• Geospatial Ecology of Marine Megafauna (GEMM) Laboratory: Spatial and behavioral studies of marine megafauna to generate an improved understanding of species ecology and distribution patterns.
• Bio-Telemetry and Behavioral Ecology Laboratory: Using telemetry and bio-logging tools to study the behavioral ecology of marine mammals.
• Oregon Marine Mammal Stranding Network (OMMSN): Documenting occurrences and investigating the causes of marine mammal strandings in Oregon.

Microproducts Breakthrough Institute

Goran Jovanovic, OSU Co-Director
Phone: 541-713-1348 (MBI Office)
Email: goran.jovanovic@oregonstate.edu
Website: http://mbi-online.org/

The MBI is a 45,000 square foot facility located on the Hewlett-Packard Corvallis campus containing offices, laboratories, fabrication facilities and laydown space for the research, development and commercialization of arrayed microfluidic systems and related nanomanufacturing technology. This facility is focused on accelerating the discovery, development and commercial deployment of new nano- and micro-scale phenomena and their technology embodiments. The MBI is collaboration between the Pacific Northwest National Laboratory (PNNL) and OSU. PNNL and OSU are leaders in the science, engineering, and technology development of nano- and micro-scale processes and systems. Collaboratively they conduct research and development projects ranging from fundamental science and technology investigations to assistance to local governments to assist them in developing climate change policies, practices, and programs.

O.H. Hinsdale Wave Research Laboratory

Pedro Lomonaco, Director
Phone: 541-737-2875
Email: pedro.lomonaco@oregonstate.edu
Website: http://wave.oregonstate.edu/

Provides outstanding research and testing at the largest nearshore experimental facility at an academic institution in the US. The 6,100 ft² (570 m²) building is situated on the main campus and houses the Large Wave Flume (LWF), Directional Wave Basin (DWB), and 3,000 ft² (300 m²) of office space for staff, graduate students, visiting researchers, and clients. The laboratory conducts research on coastal and nearshore processes involving wave-structure interaction, nearshore hydrodynamics and sediment transport, marine renewable energy, tsunami and coastal hazards and fixed and floating structures. Through our work we deliver research, testing, and education and outreach opportunities to improve the resilience and sustainability of coastal areas, and to develop innovative solutions to the design of coastal infrastructure.

Oregon Climate Change Research Institute

Philip W. Mote, Director
Kathie Dello, Associate Director
Website: http://occri.weebly.com/

The Oregon State Legislature established the Oregon Climate Change Research Institute (OCCRI) within the Department of Higher Education in 2007. OCCRI is a network of over 150 researchers at Oregon State University (OSU), the University of Oregon, Portland State University, Southern Oregon University, and affiliated federal and state labs. OCCRI is tasked with: facilitating research by faculty at Oregon’s public universities on climate change and its effects on natural and human systems in Oregon; serving as a clearinghouse for climate change information; providing climate change information to the public in integrated and accessible formats; supporting the Oregon Global Warming Commission in developing strategies to prepare for and to mitigate the effects of climate change on natural and human systems, and providing technical assistance to local governments to assist them in developing climate change policies, practices, and programs.

Oregon Wood Innovation Center

Scott Leavengood, Director
Phone: 541-737-4212
Chris Knowles, Assistant Director
Phone: 541-737-1438
Email: owic@oregonstate.edu
Website: http://owic.oregonstate.edu/

OWIC is a joint initiative of Oregon State University’s College of Forestry and Extension Service. OWIC’s mission is to improve the competitiveness of Oregon’s wood products industry by fostering innovation in products, processes, and business systems. A key function of the center is to serve as the primary link between university research and needs and opportunities in the forest industry. The forest products industry has undergone dramatic changes in recent years. The industry responded to reductions in raw material supply and the forces of globalization by consolidating, retooling production systems, and by focusing on improving efficiencies in manufacturing processes. However, it is clear that focusing solely on process innovation will be insufficient to maintain future competitive advantage. Firms must also focus on product and business systems innovation. OWIC helps foster such innovation by serving as a ‘clearinghouse’ to connect manufacturers to the research community, to other organizations that provide assistance to businesses, and to facilitate networking within the industry.

Sun Grant Western Regional Center

John R. Talbott, Director
Phone: 541-737-2194
Emails: john.talbott@oregonstate.edu or sungrant@oregonstate.edu
Website: http://sungrant.oregonstate.edu/

A network of five land grant universities serve as regional Sun Grant Centers. These universities include Oregon State University (Western Region), South Dakota State University (North-Central), Oklahoma State University (South-Central), the University of Tennessee-Knoxville (Southeastern), and Pennsylvania State University (Northeastern). The centers facilitate federally funded research, extension, and education programs in their respective regions.
The mission of the Sun Grant Initiative is to:

1. Enhance national energy security through development, distribution and implementation of biobased energy technologies;
2. Promote diversification in and the environmental sustainability of, agricultural production in the United States through biobased energy and products technologies;
3. Promote economic diversification in rural areas of the United States through biobased energy and product technologies; and
4. Enhance the efficiency of bioenergy and biomass research and development programs through improved coordination and collaboration among the Department of Agriculture, the Department of Energy, and the land grant colleges and universities.
OSU Summer Session annually serves more than 9,000 students on the Corvallis campus, as well as at the OSU Hatfield Marine Science Center on the Oregon coast. Attending summer session is an ideal way to expedite the path to graduation. It enables students to stay on track or get ahead on required coursework, and provides opportunities to perform research with faculty and seek professional development or enrichment courses.

During the summer term, Oregon State offers more than 1,200 on-site and 600 online courses in over 100 subjects, from agriculture to zoology. Courses range in length from one week to 11 weeks, with most courses running in three, four, or eight week sessions. Sequential courses (e.g., general chemistry, biology or Spanish) enable students to complete a full year’s worth of a subject in one term.

OSU Summer Session courses are held to the same rigorous academic standards as courses offered during the rest of the school year. Among the benefits of enrolling in the summer term are the smaller class sizes and increased accessibility to instructors.

The full-time summer course load for undergraduates is 12 credits; for graduate students it is 9 credits. However, with advisor approval, undergraduates may take up to 19 credits, and graduate students up to 16 credits.

Nonresident students enjoy considerable tuition savings during summer term because all students pay in-state tuition (not eligible for OSU Ecampus, VetMed or PharmD classes or INTO students).

Summer classes are open to all students who meet course requirements. Students who have been academically suspended from the university are ineligible to enroll in Summer Session. For application details, contact the OSU Office of Admissions at 800-291-4192.

For the most current Summer Session information, visit the Summer Session website (https://summer.oregonstate.edu/). The website provides important information regarding summer admission, registration procedures and deadlines, the summer calendar, tuition and fees, financial aid and housing options.

Beginning in January, updated descriptions and schedule information for OSU Summer Session courses are available online (https://classes.oregonstate.edu/).
TUITION, FEES, AND PAYMENT

Tuition, Fees, and Student Accounts

Tuition Charges
Tuition rates vary depending on factors such as academic program, residency, campus, and student or course level. For a full listing of tuition and fees, please visit the OSU Business Affairs website (http://fa.oregonstate.edu/business-affairs/tuition-and-fee-information/) or the OSU Budget Office website (http://fa.oregonstate.edu/budget/).

Mandatory Enrollment Fees
Building, Incidental, Student Health: amounts updated annually
Students pay mandatory enrollment fees each term which include the Building Fee, Incidental Fee, and Student Counseling and Health Services Fees. These fees support services that benefit all students, and are required of all enrolled students. For more detail, see Student Fee Information (https://fa.oregonstate.edu/business-affairs/student-fee-information/).

Advance Tuition Deposit: $200.00
Once you have been admitted to OSU as a degree-seeking student, to confirm intent to enroll, students are requested to submit an advance tuition deposit (ATD) of $200.00. For more information, see the Admissions website. (https://admissions.oregonstate.edu/instructions-paying-your-atd/)

Matriculation Fee: $350.00
All new students (undergraduate and graduate) are charged a one-time fee of $350.00 at the start of their first term at OSU to support access to a variety of OSU programs and services, including but not limited to: new student orientation; pre-enrollment advising; and campus open houses.

Course Fees: varies by course
Certain courses have additional fees which may include lab fees, field trip fees, and material fees. Refer to the Schedule of Classes (https://catalog.oregonstate.edu/course-search/) for individual course related fees.

Student ID Card Fee: $25.00
Charged to all new and readmitted students their first term after admission or readmission. Ecampus students are not charged this fee unless they request an ID card (email request to ID.Center@oregonstate.edu) or attend an on-campus class.

Other Fees
Every student at OSU has a student account. Charges that students incur beyond tuition and fees are posted to the student account and are part of the student's financial responsibility. This includes, but not limited to: housing, dining, library, parking, recreation center, fines and the like. For more information, visit OSU External Fees (https://fees.oregonstate.edu/Public/BrowseExternal.aspx).

Special Tuition Rate Categories
Graduate Assistants
OSU has a tuition remission policy for students who meet specific criteria and are eligible to hold a graduate assistant appointment. For more information, see the Graduate School website (https://gradschool.oregonstate.edu/finance/tuition-remission/graduate-tuition-remission-policy/).

Non-degree Students
Non-degree students (those that are not enrolled as a degree seeking student) pay undergraduate or graduate tuition based on the level of the course. If enrolled in 8 or fewer credits, the resident tuition rates apply. If taking 9 or more credits, resident or nonresident tuition rates apply, based on the student's residency status.

Non-degree students are charged the mandatory Building and Incidental Fees. To be eligible to use Student Health Services, Non-degree students must pay the Student Health fees.

Senior citizens Auditing a Course
Senior citizens in Oregon may audit courses without paying tuition or fees. The person must receive permission from the instructor before enrolling in the course, and fill out the university’s non-degree admissions application, as well as pay a non-refundable non-degree enrollment application fee. Qualifying students must be 65 years of age or older and register for 8 or fewer credits each term. Enrollment is dependent upon space availability.

All other students (under 65 years of age) auditing courses are charged tuition and fees at the same rate as courses taken for credit.

Employees and dependents
OSU offers an employee benefit to eligible employees appointed to at least .50 FTE (not including temporary or student employees) to register for courses and receive reduced tuition rates for a maximum of 12 credit hours. Eligible employees may transfer this benefit to a qualified family member each term. For more information see the Human Resources website (https://hr.oregonstate.edu/benefits/current-employees/tuition-reduction-staff-fee-privileges/).

Student Financial Obligation
Upon registering for or receiving services from the University, the student agrees to accept full responsibility to pay tuition, fees and other associated costs assessed as a result of the student’s registration or receipt of services. The student understands and agrees that registration constitutes an obligation to pay for all assessed tuition, fees and other associated costs by the published or assigned due date. Even if the student is younger than the applicable age of majority, the student agrees the educational services provided by the University are a necessity, and the student is contractually obligated pursuant to the “doctrine of necessaries.”

Any student incurring tuition, fees and any other charges at the University understands and agrees to be fully responsible for the resulting amounts that become due and owing to the University. All charges incurred by the student resulting from attendance at the University (or use of any University services) including tuition, course fees, library charges, room and board fees, health services, and other University charges are added to, and available on, the student’s account.

Financial Aid, awards, scholarships, grants, and sponsorships are all posted to the student account as credits and subsequently applied as payment for charges (in accordance with federal Title IV financial aid regulations as applicable). The student account will remain active as long the Student attends the University, receives University services, or has an account balance.

Billing
The University uses electronic billing as its official billing method. Any charge added to the student account balance is due and payable.
immediately and, therefore, the student is responsible for viewing and paying the student account at the time the charge posts to the student’s account. Students are sent an email to their ONID email account on the 5th day of each month as a reminder to view their account activity online at MyBill (http://mybill.oregonstate.edu). On the 2nd day of every month, any unpaid balance on the student’s account from the previous month incurs simple interest at the rate of 12% percent per year. There is no penalty for early repayment of all or any part of the account, and the student maintains the right to pay the outstanding debt in full at any time. Failure to review the student account does not constitute a valid reason for failing to pay the bill on time. For more information about student billing, see the Business Affairs website (https://fa.oregonstate.edu/business-affairs/student-billing/).

Payment
OSU accepts electronic check (bank debits), paper checks, credit cards, money orders, and cash as payment methods for student accounts. Online payment options can be accessed through MyBill (http://mybill.oregonstate.edu) or MyOSU (http://myosu.oregonstate.edu) (navigate to Paying for College, Financial Services, Pay My Bill). Please note any service or convenience fees associated with the selected payment option. For more information, see the OSU Cashiers website (https://fa.oregonstate.edu/business-affairs/student-billing/).

Delinquent Accounts
Financial Holds: Failure to pay the student account balance or any monies due and owed to the University will result in a financial hold on the student’s account. A financial hold will prevent the student from registering for future terms, requesting transcripts, and will restrict the student from other campus services as determined by the University.

• Registration Hold, continuing students: Enforced if the student account balance is more than $2,200 or if there are unpaid charges, of any amount, owed from any term other than the two most recent terms. If either of these conditions exist, a Registration Hold will be placed on the student account. Please note: Cascades campus students must pay their account in full in order to register.

• Registration Hold, returning students: Enforced unless the student account is paid in full. This applies to students who are no longer registered or have not attended for a term or more (other than Summer).

• Transcript Hold: Enforced if any prior term charges remain unpaid. All prior term charges must be paid in full in order to access an official transcript. Please note: Cascades campus students must pay their entire student account in full, including current term charges, in order to access an official transcript.

Interest: On the 2nd day of every month, any unpaid balance on the student’s account from the previous bill will be assessed a 1% interest charge (simple interest at the rate of 12% percent per year). There is no penalty for early repayment of all or any part of the account, and the student maintains the right to pay the outstanding debt in full at any time.

Debt Resolution: If a student fails to pay the balance owed on their student account after the fourth week of the next term, then the student is in default of their financial obligation. The University will provide the student with notice of default, and may use all remedies in law and in equity to enforce and collect the amount owed on the student’s account. Additional fees or penalties will apply. Failure to pay the student account, or any monies due and owed to the University or failure to make acceptable payment arrangements, may result in the University referring the student’s delinquent account to a collection agency.

OSU will not impose any penalty (e.g., assessment of late fees; denial of access to classes, libraries or other institutional facilities; or the requirement to borrow additional funds) to any student actively using chapter 31 or chapter 33 benefits at OSU because of the student’s inability to meet their financial obligations to OSU due to the delayed disbursement of funding from the VA under chapter 31 or chapter 33.

Drop/Withdraw Refunds
Students who drop or withdraw from a class during the first 30% of the term (or part of term) may be eligible for a partial tuition refund. If the financial aid that was disbursed to the student is revoked due to dropping or withdrawing from classes, the student must repay the revoked financial aid. Refunds are calculated from the date of official drop, withdraw, or cancellation, not the last date of class attendance. For refund deadlines, see below or the Business Affairs website (https://fa.oregonstate.edu/business-affairs/tuition-reduction-schedule/). For complete withdraw from the term, follow instructions found at Withdraw from the Term (https://Registrar.oregonstate.edu/Withdraw-Term/).

Academic Year 2019-2020

<table>
<thead>
<tr>
<th>Drop Dates for Tuition Refunds</th>
<th>Tuition Credit</th>
<th>Tuition Due</th>
</tr>
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<tbody>
<tr>
<td><strong>Fall 2019</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 6, 11:55 pm or before end of first full week.</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>October 7 - October 20, 11:55 pm. Second &amp; third full week.</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>After October 20, 11:55 pm.</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Winter 2020</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 12, 11:55 pm or before end of first full week.</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>January 13 - January 26, 11:55 pm. Second &amp; third full week.</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>After January 26, 11:55 pm.</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Spring 2020</strong></td>
<td></td>
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</tr>
<tr>
<td>April 12, 11:55 pm or before end of second full week.</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>April 13 - April 19, 11:55 pm. Third full week.</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>After April 19, 11:55 pm.</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Special Fees

Admission Office (not refundable)
• Application Fee, Undergraduate: $65.00
• Application Fee, Graduate, US Citizen/Permanent Resident: $75.00
• Application Fee, Graduate, International: $85.00
• Application Fee, Non-degree, Undergraduate: $30.00
• Application Fee, Non-degree, Graduate: $35.00
• Re-Admission Fee, Undergraduate: $25.00. Required after an absence of one year.
• Re-Admission Fee, Graduate: Domestic Students $75.00; International Students $85.00. Required after an absence of one term.
• Reinstatement Fee: $50.00. Required after student is suspended and wishes to be reinstated.

Office of the Registrar
• Diploma Mailing Fee: $25.00, or $40.00 for out of U.S.
• Duplicate Diploma: $40.00
• Examination for Credit or Waiver $80.00 per exam
• FAX Service: $20.00 per request to fax documents
• Late Course Change: $20.00 per course changed. This applies to any late add, late add to audit, late drop, late withdrawal from a course, late change in grading basis, or late change in course credit done after the stated deadlines, see Office of the Registrar website (https://registrar.oregonstate.edu/osu-academic-calendar/).
• Late Registration Fees, during first two weeks of classes: $50.00
• Late Registration Fees, after the second week of classes and by approval only: $100.00
• PELP Fee (Undergraduate Planned Educational Leave Program): $25.00. The non-refundable application fee allows an undergraduate student to maintain their official standing as a student at OSU and reserves the student’s right to keep their original academic catalog active during their absence.
• Transcripts: $10.00 or no fee depending on delivery method, see Office of the Registrar website (http://registrar.oregonstate.edu/transcripts/). Please note that all obligations to OSU must be cleared before transcript orders can be processed.
• Verification of Enrollment Fee: $15.00 per verification. See Office of the Registrar website (https://registrar.oregonstate.edu/verify-your-enrollment/).

Business Affairs
• Collection Account Processing Fee: $5.00 to $60.00
• Returned Check Fee: $25.00
• Stop Payment Fee: $20.00
• Sponsored Student Administrative Fee: $275.00 per term. An administrative management fee is charged for international students supported under contractual arrangement with sponsoring agencies or entities requiring special administrative or management services beyond those normally provided.

Billing Questions
If there appears to be an error on your monthly statement, use the following guidelines:

Financial Aid questions: Contact the Office of Financial Aid and Scholarships - A218 Kerr Administration Building, 541-737-2241, financial.aid@oregonstate.edu

Graduate Assistants: Please contact your department. For information regarding GRA/GTA, see the Graduate School website (https://gradschool.oregonstate.edu/finance/graduate-assistantships/).

Housing questions: Contact University Housing and Dining Office - Oxford House, 957 SW Jefferson Ave, 541-737-4771, or please see UHDS website (https://uhds.oregonstate.edu/housing/room-dining-rates-common-charges/).

Residency questions: Please see Admissions website (https://admissions.oregonstate.edu/residency/).

Sponsor Payment questions: Contact Business Affairs - B100 Kerr Administration Building, 541-737-3775, ThirdPartyBilling@oregonstate.edu

Other Billing questions: Contact Business Affairs - B100 Kerr Administration Building, 541-737-3775, Accounts.Receivable@oregonstate.edu

Financial Aid
Scholarships, Student Loans, and Grants
Eligible students who have accepted scholarships, student loans and grant awards will have those funds applied automatically to their student billing account. You can monitor your financial aid eligibility and billing account through MyOSU.

If financial aid amounts exceed the amount of qualifying tuition/fees expenses owed, a refund will be generated if the surplus exceeds $1.00. Distribution of the refund can be made by direct deposit or check. Please note that federal financial aid cannot be posted toward the balance of the matriculation fee, accrued interest, printing charges, parking or library fines or student health service charges.

• If you would like direct deposit of your financial aid refund, complete the Direct Deposit form found through Online Services or Student Finance website (http://fa.oregonstate.edu/business-affairs/student-finance/).
• If you would like your refund as a check, your current mailing address must be up to date for all check processing. You can do this through MyOSU (https://myosu.oregonstate.edu/).

For full details, visit the Business Affairs Office Website. Click on Current Student.

Beginning the third week of the term, students eligible for refunds due to financial aid or scholarship disbursements may request a refund at the Cashier’s Office or through email at refund@oregonstate.edu.

Emergency Loans
Emergency loans, not to exceed $350.00 per term, are available to students in good financial standing, attending at least half time, and formally admitted to the university. Loans are to be repaid by the last day of the current term. Loan amounts become part of the revolving account balance and carry interest at 1 percent per month (12 percent APR). The Cashier’s Office reviews the applications and issues payment if approved. Application forms are available at the Cashier’s Office in the Kerr Administration Building. Be sure to have your OSU ID and a second photo ID to present with the application.

Ecampus students can email cashiers.office@oregonstate.edu to request the application. They will be asked to scan the completed form and email it back to the Cashier’s Office with accompanying identification.
Residency Requirements

Payment of Student Fees

Payment of Nonresident Instruction Fee (580-10-080)
1. All students classified as nonresidents shall pay a nonresident fee.
2. Refunds of the nonresident fee may be granted if the student shows that the classification previously assigned was in error. However, no such refund shall be made unless the student applies and submits all supporting information for residency status prior to the last day to register for the term in which the student seeks the change of status.

Enrollment of Spouse and Dependent Children (580-010-086)
The spouse and dependent children of regular department staff members with a full-time equivalent of at least .50 may enroll as students at resident fee rates in department institutions.

In-State Tuition for Veterans
The following individuals shall be charged the in-state rate, or otherwise considered a resident, for tuition and fees purposes:

• A Veteran using educational assistance under either chapter 30 (Montgomery G.I. Bill - Active Duty Program) or chapter 33 (Post-9/11 G.I. Bill), of title 38, United States Code, who lives in the State of Oregon while attending a school located in the State of Oregon (regardless of his/her formal State of residence) and enrolls in the school within three years of discharge or release from a period of active duty service of 90 days or more.

• Anyone using transferred Post-911 G.I. Bill benefits (38 U.S.C. § 3319) who lives in the State of Oregon while attending a school located in the State of Oregon (regardless of his/her formal State of residence) and enrolls in the school within three years of the transferor's discharge or release from a period of active duty service of 90 days or more.

• Anyone using benefits under the Marine Gunnery Sergeant John David Fry Scholarship (38 U.S.C. § 3311(b)(9)) who lives in the State of Oregon while attending a school located in the State of Oregon (regardless of his/her formal State of residence) and enrolls in the school within three years of the Service member's death in the line of duty following a period of active duty service of 90 days or more.

• Anyone described above while he or she remains continuously enrolled (other than during regularly scheduled breaks between courses, semesters, or terms) at the same school. The person so described must have enrolled in the school prior to the expiration of the three-year period following discharge, release, or death described above and must be using educational benefits under either chapter 30 or chapter 33, of title 38, United States Code.

Residency Requirements

Residency: OSU Admissions Website
For further details about residency, please visit the OSU Admissions website (http://admissions.oregonstate.edu/residency/) or email Residency@oregonstate.edu.

Appendix I: Residency Standards: A–G

A. Definitions
For the purpose of these Residency Standards the following definitions apply

1. "Domicile" is a person's true, fixed, and permanent home and place of habitation. It is the place where a person intends to remain and to which the person expects to return when the person leaves without intending to establish a new domicile elsewhere. In order to establish a domicile in Oregon, a person must maintain a predominant physical presence in Oregon for 12 consecutive months after moving to the state.

2. A 'financially independent person' is a person who, at the time of application for residency status: (a) declares themselves to be financially independent; (b) has not been claimed as a dependent during the immediately preceding tax year, and will not be claimed as a dependent during the current tax year, on the federal or state income tax returns of any other person; and (c) has not received in the immediately preceding calendar year, and will not receive during the current calendar year, one-half or more of their support, in cash or in kind, from another person or persons, except for support received from their spouse.

3. A 'financially dependent person' is a person who, at the time of application for residency status: (a) declares themselves to be financially dependent; and (b) has been claimed as a dependent on the federal and state income tax returns of another person during the immediately preceding tax year.

4. "University" or 'Universities' are Oregon public universities listed in ORS 352.002.

5. 'Residency Procedure' is the procedure attached as Appendix II to the Interinstitutional Residency Compact, including any subsequent amendments as described in that
5. A financially dependent person who is claimed as a dependent by another person who has not established and maintained an Oregon domicile shall be presumed to be a non-resident. This presumption may be overcome by evidence of the student’s long-standing presence in Oregon and demonstration of other factors under Section C of these Standards.

6. The criteria for determining Oregon resident classification shall also be used to determine whether a person who has moved from Oregon has established a non-Oregon residence.

7. If institution records show that the residence of a student or the person upon whom the student is dependent is outside of Oregon, the student shall continue to be classified as a nonresident until entitlement to resident classification is shown. The burden of showing that the residence classification should be changed is on the student requesting the change.

8. Notwithstanding section B.4 of these Standards, a student who is financially dependent on a non-Oregon resident may nonetheless be considered an Oregon resident if the student resides in Oregon for at least 12 consecutive months with a parent or legal guardian who has both: (a) established and maintained an Oregon domicile for 12 consecutive months; and (b) during that period, has been primarily engaged in activities other than those of being a college student.

1. Oregon law establishes two exemptions from non-resident tuition. ORS 351.641 provides an exemption for students who are not US citizens or lawful permanent residents, but who meet certain other qualifications, including attendance at an Oregon school and receiving a high school diploma or equivalent in Oregon. ORS 352.375 provides an exemption for qualified veterans of the U.S. Armed Forces. Students who qualify for either of these exemptions are not considered Oregon residents under these Residency Standards. However, they are exempt from paying non-resident tuition. Questions about these exemptions and the process for establishing eligibility should be directed to the appropriate official at each university.

C. Residency Consideration Factors

1. The following factors, although not necessarily conclusive or exclusive, have probable value in support of a claim for Oregon resident classification:
   a. Reside in Oregon for 12 consecutive months prior to the beginning of the term for which resident classification is sought and during that period be primarily engaged in activities other than those of a college student;
   b. Reliance upon Oregon resources for financial support;
   c. Domicile in Oregon of persons legally responsible for the student;
   d. Acceptance of an offer of permanent employment in Oregon; and
   e. Ownership by the person of their living quarters in Oregon.

2. The following factors, standing alone, do not constitute sufficient evidence to effect classification as an Oregon resident:
   a. Voting or registration to vote;
   b. Employment in any position normally filled by a student;
   c. The lease of living quarters;
   d. Admission to a licensed practicing profession in Oregon;
   e. Automobile registration;
   f. Public records, for example, birth and marriage records, Oregon driver’s license;
   g. Continuous presence in Oregon during periods when not enrolled in school;
   h. Ownership of property in Oregon or the payment of Oregon income or other Oregon taxes; or
   i. Domicile in Oregon of the student’s spouse.

D. Evidence of Financial Dependency

In determining whether a student is financially dependent, a student must provide:
   a. Evidence of established domicile of the person claiming the student as a dependent; and
   b. The identification of the student as a dependent on the federal and state income tax returns of the person claiming the student as a dependent. Additional documentation to substantiate dependency during the current calendar year may be required at a later time if deemed necessary by the institution.
   c. A student who provides evidence that they are a financially dependent person under these rules shall not be required to establish a 12-month domicile prior to classification of resident status, provided such a student may not be classified as a resident while receiving financial assistance from another state or state agency for educational purposes.

E. Residence Classification of Armed Forces Personnel

1. For purposes of these Standards, members of the armed forces means officers and enlisted personnel of:
   a. The Army, Navy, Air Force, Marine Corps, and Coast Guard of the United States;
   b. Reserve components of the Army, Navy, Air Force, Marine Corps, and Coast Guard of the United States;
   c. The National Guard of the United States and the Oregon National Guard.

2. Notwithstanding Section B, active members of the armed forces and their spouses and dependent children shall be considered residents for purposes of an institution’s tuition and mandatory enrollment fees if the members:
   a. Reside in this state while assigned to duty at any base, station, shore establishment, or other facility in this state;
   b. Reside in this state while serving as members of the crew of a ship that has an Oregon port of shore establishment as its home port or permanent station; or
   c. Reside in another state or a foreign country and file Oregon state income taxes no later than 12 months before leaving active duty.

3. An Oregon resident entering the armed forces retains Oregon residence classification until it is voluntarily relinquished.

4. An Oregon resident who has been in the armed forces and assigned on duty outside of Oregon, including a person who establishes residency under section E.2.c of these Standards, must, within a reasonable time, demonstrate intent to retain classification as an Oregon resident. Such intent may be shown by returning to Oregon within six months after completing service in the armed forces.

5. A person who continues to reside in Oregon after separation from the armed forces may count the time spent in the state while in the armed forces to support a claim for classification as an Oregon resident.
6. The dependent child and spouse of a person who is a resident under Section E.2 of these Standards shall be considered an Oregon resident. 'Dependent child' includes any child of a member of the armed forces who:
   a. Is under 18 years of age and not married, otherwise emancipated or self-supporting; or
   b. Is under 23 years of age, unmarried, enrolled in a full-time course of study in an institution of higher learning, and dependent on the member for over one-half of his/her support.

F. Residence Classification of Members of Oregon Tribes
1. Students who are enrolled members of federally recognized tribes of Oregon or who are enrolled members of a Native American tribe which had traditional and customary tribal boundaries that included parts of the state of Oregon or which had ceded or reserved lands within the state of Oregon shall be assessed resident tuition regardless of their state of residence.
2. For purposes of these Standards, the federally recognized tribes of Oregon are:
   a. Burns Paiute Tribe;
   b. Confederated Tribes of Coos, Lower Umpqua and Siuslaw;
   c. Confederated Tribes of Grand Ronde Community of Oregon;
   d. Confederated Tribes of Siletz Indians of Oregon;
   e. Confederated Tribes of the Umatilla Indian Reservation;
   f. Confederated Tribes of the Warm Springs Indian Reservation;
   g. Coquille Indian Tribe;
   h. Cow Creek Band of Umpqua Indians;
   i. Klamath Tribes.
3. For purposes of this rule these Standards, the Native American tribes which had traditional and customary tribal boundaries that included parts of the state of Oregon or which had ceded or reserved lands within the state of Oregon are:
   a. CALIFORNIA:
      1. Benton Paiute Tribe;
      2. Big Bend Rancheria;
      3. Big Lagoon Rancheria;
      4. Blue Lake Rancheria;
      5. Bridgeport Indian Colony;
      6. Cedarville Rancheria;
      7. Fort Bidwell Indian Tribe;
      8. Hoopa Valley Tribe;
      9. Karuk Tribe of California;
     10. Likely Rancheria;
     11. Lookout Rancheria;
     12. Lytton Rancheria;
     13. Melochundum Band of Tolowa Indians;
     14. Montgomery Creek Rancheria
     15. Pit River Tribe;
     16. Quartz Valley Indian Community;
     17. Redding Rancheria;
     18. Roaring Creek Rancheria;
     19. Smith River Rancheria;
     20. Susansville Rancheria; Tolowa-Tututni Tribe;
     21. Winnemucca Colony;
     22. XL Ranch;
     23. Yurok Tribe.
   b. IDAHO:
      1. Nez Perce Tribe of Idaho;
      2. Shoshoni-Bannock Tribes.
   c. NEVADA:
      1. Duck Valley Shoshone-Paiute Tribes;
      2. Fallon Paiute-Shoshone Tribe;
      3. Fort McDermitt Paiute-Shoshone Tribe;
      4. Lovelock Paiute Tribe;
      5. Pyramid Lake Paiute Tribe;
      6. Reno-Sparks Indian Colony;
      7. Summit Lake Paiute Tribe;
      8. Walker River Paiute Tribe;
      9. Winnemucca Indian Colony;
   d. OKLAHOMA: Modoc Tribe of Oklahoma.
   e. WASHINGTON:
      1. Chehalis Community Council;
      2. Colville Confederated Tribes;
      3. Quinault Indian Nation;
      4. Shoalwater Bay Tribe;
      5. Yakama Indian Nation.
4. A student seeking to be assessed resident tuition and mandatory enrollment fees under these Standards shall submit, following procedures prescribed by the University where the student seeks to enroll, a photocopy of tribal enrollment which documents tribal membership.

G. Residence Classification of Non-Citizens
1. A person who is not a citizen of the United States may be considered an Oregon resident if the person qualifies as a resident under Section B and is one of the following:
   a. A lawful permanent resident. The date of approval of lawful permanent residency shall be the earliest date upon which the 12-month residency requirements under Section B may begin to accrue.
   b. An immigrant granted refugee or political asylum in the United States. The date of approval of political asylum or refugee status shall be the earliest date upon which the 12-month residency requirements under Section B may begin to accrue.
   c. A person holding one of the following non-immigrant visa classifications: A, E, G, H-1B, H-1C, the spouse or child of a person holding an H-1B or H-1C visa, I, K, L, NATO, O, R, S, T, TN, U, or V. The date of the issuance of a visa for one of these classifications shall be the earliest date upon which the 12-month residency requirements under Section B may begin to accrue. A person possessing a non-immigrant or temporary visa that is not identified under these Standards shall not be considered an Oregon resident under this Section G.1.c.

Appendix II: Residency Procedure: A–C
A. Definitions
Definitions in the Residency Standards shall also apply to this Residency Procedure.
B. Changes in Residence Classification
1. Unless otherwise specified in the Residency Standards, if an Oregon resident student enrolls in an institution outside of Oregon and later seeks to enroll in a University that applies these Residency Standards, the residence classification of that student shall be re-examined and determined on the same basis as for any other person.

2. A student who becomes eligible for resident tuition during a term of enrollment at a University will not qualify for resident tuition until the beginning of the next term.

3. Once established, classification as a resident continues so long as the student remains in continuous academic year enrollment in the classifying University.

4. A person who seeks eligibility for resident tuition under these rules shall complete and submit a notarized Residence Information Affidavit. The affidavit and all required supportive documents and materials must be submitted by the last day to register for the term in which resident status is sought.

5. Universities that apply this Residency Procedure are only bound by determinations of residency that follow this Procedure, including timely submittal of the notarized affidavit.

C. Review of Residence Classification Decisions
   1. An inter-institutional residency committee (IRC) is established consisting of the officers who determine student residence classification at each University that applies this Residency Procedure. The chair of the committee shall rotate among the Universities with no chair serving more than two consecutive years. A majority of the members of the Committee shall constitute a quorum. A majority of a quorum may make recommendations.

   2. Residence cases of unusual complexity, especially where there may be conflict of rules, may be referred by the originating classification officer to the IRC for its recommendation to the registrar or designee.

   3. Any person who is aggrieved by the originating classification officer’s classification decision may, within ten days of the date of mailing or other service of the classification decision, request that the IRC review the classification and make recommendations to the registrar or designee of the originating university. The appeal must be in writing and shall be filed with the originating University. An aggrieved person may supply written statements to the IRC for consideration in reviewing the case and may also make an oral presentation to the IRC on a date to be scheduled by the IRC. The IRC shall make a recommendation to the registrar or designee of the originating University. That registrar or designee shall then issue a decision. The decision of the registrar or designee shall be final unless appealed.

   4. A person dissatisfied with the decision of the registrar or designee may, within ten days of the date of the mailing or other service of the decision, appeal the decision to the president or designee of the originating University. An appeal shall be in writing only. The decision of the president or designee shall be final.

   5. A person granted a meritorious hardship exception to residency under the Oregon Administrative Rules regarding residency prior to July 1, 1990, shall not lose the exception solely because of the repeal of the exception authorization.
TUTORING AND STUDENT SUPPORT SERVICES

Departments and Offices

There are numerous departments dedicated to your success as a student. Get involved on campus, find support for a challenging class, discover your community, connect with new friends or obtain help during a hard time. Our programs and services are here to assist you.

• Academic Achievement: (http://oregonstate.edu/studentaffairs/academic-achievement/) These units work to increase and equalize student success, support retention, help students graduate and foster the holistic development of students.

• Academics for Student Athletes (http://studentathlete.oregonstate.edu/): This office provides academic and personal support to all student athletes at Oregon State University.

• Academic Success Center (http://success.oregonstate.edu/): The Academic Success Center creates opportunities for students to learn how to learn throughout their academic careers. Services include drop-in consultations, academic coaching, the Learning Corner (https://success.oregonstate.edu/learning/) online resource, and supplemental instruction.

• Associated Students of Oregon State University (http://asosu.oregonstate.edu/): ASOSU is the student government body at Oregon State. It supports the varied interests of OSU students through democratic representation.

• Career Development Center: (http://oregonstate.edu/career/) The Career Development Center provides comprehensive professional development to all OSU students through presentations, workshops and appointments. The center also hosts the quarterly Career Expo and maintains Handshake, a networked platform that connects students with employers and thousands of job and internship opportunities.

• Center for Fraternity & Sorority Life (http://studentlife.oregonstate.edu/cfsi/): The Center for Fraternity & Sorority Life advocates for the interests of the Greek community at OSU by providing advice to governing chapters. The center serves as the direct university contact for organization headquarters staff.

• College Assistance Migrant Program (CAMP): (http://camp.oregonstate.edu/) This program provides financial and academic support to first-year students with the goal of preparing them for success in college. CAMP works with faculty, student services and community-based agencies to improve educational opportunities.

• Counseling & Psychological Services: (http://oregonstate.edu/counsel/) Counseling & Psychological Services provides individual, couples and group counseling for OSU students, as well as outreach and education on topics like mindfulness, stress management and suicide prevention.

• Craft Center (http://sli.oregonstate.edu/craft/): The Craft Center supports an enriched experiential learning experience where students can foster their own creativity. The center offers ceramic, glass, jewelry, woodworking and photography classes, in addition to fluctuating craft events and activities.

• Cross Campus Strategic Initiatives: (http://studentaffairs.oregonstate.edu/ccsi/) Oversees the development, implementation, and assessment of campus-wide initiatives in support of the transition, integration, and advisement of matriculated students. We provide training, resources, transitional coursework, advocacy, expertise and community-building opportunities for professional faculty, instructional faculty and students.

• Disability Access Services: (http://ds.oregonstate.edu/home/) Disability Access Services facilitates access to university programs and services for individuals with disabilities through accommodations, education, consultation and advocacy.

• Educational Opportunities Program: (http://eop.oregonstate.edu/) EOP provides a welcoming environment that supports the full development of the personal and academic potential of students who have traditionally been denied equal access to higher education. This includes but is not limited to students of color, low-income students, first generation in college (neither parent graduated) and undocumented or DACAmented students.

• Diversity & Cultural Engagement (http://oregonstate.edu/dept/iss/): Diversity & Cultural Engagement is committed to the development of underserved students by creating and advocating for inclusive and educationally purposeful initiatives that enhance learning, academic success, cross-cultural fluency and self-efficacy.

• Family Resource Center (http://familyresources.oregonstate.edu/): Located in Champinefu Lodge, the Family Resource Center provides a welcoming place for families to spend time on campus with their children. The center advocates for and supports students with families by focusing on quality early education and children's care centers, lactation support and financial assistance.

• Human Services Resource Center: (http://studentlife.oregonstate.edu/hsrc/) The Human Services Resource Center provides low-income students with the resources they need to be academically successful. HSRC services include food insecurity, housing and textbook expense support.

• Louis Stokes Alliance for Minority Participation: (http://lsamp.oregonstate.edu/) LSAMP is dedicated to increasing the number of traditionally underrepresented students successfully completing science, technology, engineering and mathematics baccalaureate degree programs.

• Mathematics & Statistics Learning Center (https://math.oregonstate.edu/mlc/): Provides free drop-in tutoring, resources, make-up testing, a mathematics education resource room and a computer classroom with Mathematical Software (https://math.oregonstate.edu/mlc_software/) installed.

• Memorial Union: (http://osumu.org/) The Memorial Union is the community center of OSU and serves students, alumni, staff and guests. The MU complements students’ academic experience through cultural, educational, social and recreational programs.

• Men's Development & Engagement (https://studentaffairs.oregonstate.edu/AAESS/mens-development-engagement/): MDE provides engaging and innovative programs that support male-identified student success, develop healthy men and masculinities and engage male-identified individuals and groups in exploration of identity development and societal norms. Through one-on-one sessions and group meetings, the MDE’s Distinguished Scholars Initiative supports the continued development of self-efficacy, servant leadership, professional skills and academic excellence for OSU male students of color.
• Military & Veteran Resources (http://studentlife.oregonstate.edu/veterans/): The Military & Veteran Resources provides support to military service members, veterans, and their families studying at OSU. The office helps navigate the requirements of higher education to ensure awareness of available benefits and services and foster a successful learning experience.

• New Student Programs & Family Outreach: (http://oregonstate.edu/soar/) New Student Programs & Family Outreach serves as a campus leader in facilitating the transition process for new students and their family members, promoting and enhancing successful transitions through collaborative programs and outreach.

• Office of International Services: (http://international.oregonstate.edu/) This office supports international students from admissions through graduation with advising services and guidance on settling in at Oregon State. Staff are available to help you with questions and locate other services on campus, as needed.


• Recreational Sports: (http://oregonstate.edu/recsports/) The Department of Recreational Sports provides an extensive and diverse list of sport, fitness and adventure opportunities to serve the varied recreation preferences and interests of the campus community.

• Student Conduct & Community Standards: (http://oregonstate.edu/studentconduct/) The Office of Student Conduct & Community Standards handles student-conduct and related matters at Oregon State University.

• Student Experiences & Engagement: (http://sli.oregonstate.edu/) In addition to the Craft Center and Orange Media Network, this unit supports students and student groups by providing opportunities for leadership and community involvement. This department houses the Center for Civic Engagement (http://sli.oregonstate.edu/cce/), Late Night (http://sli.oregonstate.edu/latenight/) programs, the OSU Program Council (http://sli.oregonstate.edu/osupc/) and Leadership Development (https://sli.oregonstate.edu/ld/).

• Student Life (http://studentlife.oregonstate.edu/): The Office of Student Life fosters environments that enable students to effectively engage in their academic work, develop cultural competencies and global awareness, and become informed citizens.

• Student Care (http://studentlife.oregonstate.edu/student-care/): Student Care is designed help students manage unexpected life events, personal crises, mental health struggles, academic difficulties and challenges that can interfere with college success.

• Student Health Services: (http://studenthealth.oregonstate.edu/) Student Health Services contributes to the success of students and the university community by providing medical and health promotion services while creating a safe environment for all individuals.

• TRIO Student Support Services: (http://trio-sss.oregonstate.edu/) TRIO-SSS helps first-generation college students and other students who would benefit from additional support make the transition to college, offering academic guidance, professional development, peer mentorship, technology access, student success seminars and additional services. To learn about eligibility requirements or to apply, visit the TRIO-SSS website.

• University Exploratory Studies Program: (http://uesp.oregonstate.edu/) UESP is the academic home for students who are exploring their options before deciding on a major and offers a comprehensive range of services to help students make informed decisions about their academic coursework and potential majors while they are exploring.

• University Housing & Dining Services: (http://oregonstate.edu/uhds/dining/) University Housing & Dining Services offers on-campus residents a connection from the moment they arrive to campus. UHDS facilities include 15 residence halls, three dining centers, an on-campus grocery store and one family housing complex, providing students with connections to residential staff, academic support services, healthy dining options and leadership opportunities right where they live.

• Writing Center: (http://writingcenter.oregonstate.edu/) The Writing Center offers three programs in support of Oregon State University student writing: The Undergrad Research & Writing Studio, The Graduate Writing Center, and The Online Writing Lab.
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